



UNIVERSITA' DEGLI STUDI DI PADOVA

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CORSO DI LAUREA IN INGEGNERIA BIOMEDICA

RELAZIONE TIROCINIO IN BTS Spa

IMPLEMENTAZIONE DI UN PROTOCOLLO PER

L'ANALISI DELLA CAMMINATA

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Indice

Rigraziamenti.....	3
Indice.....	5
Sommario.....	7
1 L'AZIENDA: BTS Spa.....	9
1.1 Presentazione.....	9
1.2 Obiettivi aziendali.....	10
1.3 Attività.....	10
1.4 Settori in cui opera BTS.....	11
1.4.1 BTS per la medicina.....	11
1.4.2 BTS per la ricerca.....	11
1.4.3 BTS per lo sport.....	11
1.5 Prodotti di BTS.....	12
1.5.1 Bioengineering.....	12
1.5.2 Biomedical.....	12
1.5.3 Strumento di lavoro: il sistema SMART.....	12
2 L'ANALISI DEL MOVIMENTO.....	22
2.1 Introduzione.....	22
2.2 Analisi cinematica.....	22
2.3 Analisi video.....	22
2.4 Analisi cinetica.....	23
2.5 Analisi elettromiografica dinamica.....	23
2.6 Principali componenti di un sistema per l'analisi del movimento.....	23
2.6.1 Sistema optoelettronico.....	23
2.6.2 Calibrazione delle telecamere.....	25
2.6.3 Ricostruzione e <i>tracking</i>	29
2.6.4 Piattaforme di forza.....	32
2.6.5 Elettromiografo.....	34
2.6.6 Video Controller.....	35
3 L'ATTIVITÀ DI TIROCINIO.....	36
3.1 Presentazione e obiettivi del progetto.....	36
3.2 Descrizione del codice sviluppato durante il tirocinio.....	36
3.3 Sviluppo del protocollo Davis [1].....	37
3.3.1 Descrizione protocollo Davis [1].....	37
3.3.2 Implementazione.....	38
3.4 Il protocollo CAST [2].....	40
3.4.1 Descrizione protocollo CAST con sistemi di riferimento angoli e calibrazioni punti di repera.....	40
3.4.2 Acquisizioni su soggetti.....	41
3.4.3 Implementazione.....	46
3.4.4 Stima della posizione del centro d'anca (FH).....	47
4 CONCLUSIONI.....	50
APPENDICE A: Codice sviluppato (versione .XML).....	52
APPENDICE B: Bibliografia e riferimenti.....	119

Sommario

L'analisi del movimento umano consiste nella rilevazione tridimensionale di grandezze cinematiche (spostamento nello spazio, velocità e accelerazione), dinamiche (analisi delle forze coinvolte nel movimento) ed elettromiografiche (muscoli attivati nel movimento) durante l'esecuzione di un gesto motorio.

Essa riveste una considerevole importanza in quanto permette di:

- definire il livello di limitazione funzionale e di disabilità conseguente alla patologia e il suo evolversi con la crescita/invecchiamento dell'individuo;
- valutare e quantificare gli effetti dei diversi trattamenti e monitorare tali effetti nel tempo;
- contribuire alla pianificazione di un trattamento riabilitativo permettendo la stesura di un programma personalizzato che consenta di verificare oggettivamente, lo stato clinico del paziente prima, durante e alla fine del trattamento stesso.

Nel corso delle cinquecento ore di tirocinio svolte presso il reparto ricerca e sviluppo della BTS Spa, mi sono interfacciato con la disciplina "dell' analisi del movimento", essendo l'azienda, produttrice e sviluppatrice di un sistema stereo fotogrammetrico (SMART).

La parte iniziale del tirocinio è stata rivolta ad apprendere l' utilizzo del sistema di acquisizione e conoscere l'ambiente di sviluppo che esso mette a disposizione.

La seconda parte della mia attività è stata invece rivolta all'implementazione mediante lo SMART Analyzer (un software prodotto da BTS per l'elaborazione dei dati acquisiti con il sistema stereofogrammetrico) di un protocollo per l'analisi della camminata: il CAST [2].

Inoltre ho contribuito all'implementazione del protocollo Davis [1], anche se si trattava di un progetto già avviato in azienda e da me ottimizzato nell'architettura sempre mediante il medesimo ambiente di sviluppo.

Nelle pagine che seguiranno, verrà presentata una descrizione dell'azienda BTS, delle attività svolte, dei suoi obiettivi e dei suoi settori applicativi; verrà poi descritto il sistema SMART con i vari componenti che lo caratterizzano, facendo particolare attenzione al modulo SMART Analyzer, che rappresenta lo strumento principale utilizzato durante il tirocinio.

La seconda parte della relazione avrà come argomento i protocolli specifici implementati (Davis [1] e CAST [2]), assieme alla descrizione del codice sviluppato a tal fine.

1 L'AZIENDA: BTS Spa

1.1 Presentazione

BTS Spa viene fondata nel 1986 in seguito ad uno *Spin-off* del Centro di Bioingegneria della Fondazione Don Gnocchi e del Politecnico di Milano. Scopo della start-up era lo sfruttamento industriale delle innovative metodologie per l'analisi del movimento sviluppate dai ricercatori del Centro di Bioingegneria.

Nel 2000 nasce a Padova, come Spin-off dell'Università di Padova e con l'aiuto di un paio imprenditori locali, un'azienda chiamata eMotion; anch'essa si occupa di innovazioni tecnologiche per l'analisi del movimento.

Nel 1999 la BTS viene acquistata da TC Sistema Spa e nel 2000 TC Sistema acquista pure eMotion.

Nel 2004, attraverso un'operazione di MBO la società BTS è stata acquistata da dodici dipendenti con la partecipazione di tre imprenditori esterni ed incorpora, nel 2005, la padovana eMotion che, nella sede di Padova, costituisce il gruppo di ricerca e sviluppo dell'azienda.

Con oltre trecentoquaranta clienti in quaranta paesi del Mondo, ventotto dipendenti (di cui ventuno ingegneri, undici dei quali dedicati alla ricerca e sviluppo) e due sedi (Padova e Milano), oggi BTS è uno dei leader mondiali delle tecnologie per l'analisi del movimento.

Giorno dopo giorno l'azienda mira a diventare il riferimento industriale per le tecnologie e le applicazioni dell'analisi del movimento nel mondo clinico.

1.2 Obiettivi aziendali

L'obiettivo di BTS Spa è contribuire attivamente al lavoro dei Clienti offrendo loro idee, consulenza, tecnologie, soluzioni e servizi.

BTS si propone inoltre di:

- Stabilire rapporti duraturi con gli utenti basati sulla qualità e sul senso di responsabilità.
- Contribuire allo sviluppo del mercato ricercando e sviluppando costantemente nuove tecnologie attraverso partnership di valore mondiale con i più importanti centri di ricerca con competenze internazionali.
- Favorire lo sviluppo della conoscenza delle applicazioni di analisi del movimento facilitando i contatti e le relazioni tra gli specialisti e gli operatori del settore.

1.3 Attività

BTS produce strumentazioni scientifiche innovative per l'analisi del movimento. I suoi sistemi supportano il lavoro di medici, ingegneri e ricercatori che hanno la necessità di ottenere informazioni oggettive ed accurate, utili per i loro scopi.

Le soluzioni BTS:

- Sistemi integrati per l'analisi clinica del movimento.
- Sistemi per l'acquisizione e l'elaborazione di segnali elettromiografici.
- Sistemi dinamici per l'analisi della postura.
- Sistemi optoelettronici per la misura della ventilazione polmonare.
- Sistemi per il controllo degli stati vegetativi.
- Sistemi per la riabilitazione neuromotoria in ambienti immersivi.

1.4 Settori in cui opera BTS

1.4.1 BTS per la medicina

Ospedali, Centri di Cura e Cliniche Riabilitative utilizzano i sistemi di analisi del movimento BTS per analizzare le disfunzioni del movimento, prescrivere il trattamento riabilitativo più adatto e valutarne l'efficacia. Il personale medico ottiene in modo rapido, accurato e non invasivo una dettagliata analisi quantitativa integrata dei parametri biomeccanici e neuromuscolari del paziente esaminato. Oggi, oltre 10.000 pazienti all'anno vengono assistiti nel loro percorso clinico dai sistemi di analisi del movimento BTS.

1.4.2 BTS per la ricerca

I più prestigiosi istituti scientifici e Universitari utilizzano i sistemi BTS per compiere ricerche nei campi della Biomeccanica, Biometria, Diagnostica e scienze motorie. La tecnologia BTS è stata impiegata nei più importanti programmi spaziali; sistemi BTS sono stati installati sulle stazioni Spacelab e MIR. Sistemi BTS sono impiegati da NASA, ESA, CNRS nei programmi di volo parabolico e per una serie di esperimenti per l'International Space Station Program.

1.4.3 BTS per lo sport

I sistemi BTS sono impiegati da numerose organizzazioni di medicina sportiva con lo specifico obiettivo di massimizzare le prestazioni degli atleti, prevenire infortuni e migliorare l'efficacia della riabilitazione post-traumatica. I sistemi BTS sono anche utilizzati da prestigiose squadre di calcio quali l'A.C. Milan, F.C. Juventus e F.C. Real Madrid per le valutazioni di routine dei loro giocatori.

1.5 Prodotti di BTS

1.5.1 Bioengineering

Laboratori integrati: BTS LAM, BTS EMGLAB e BTS SPORTLAB.

Cinematica: BTS SMART DX, BTS SMART-D, BTS VIXTA, BTS SMART-Analyzer, BTS SMART-Clinic e BTS SMART-Performance.

Elettromiografia: BTS FREEEMG 300, BTS POCKETEMG, BTS EMG-Analyzer e BTS EMGenius.

Analisi delle forze: Piattaforme di forza, BTS Sway e BTS Digivec.

Baropodometria: FScan, CONFORMat, GRIP, WALKWAY e Moduli oftware TESKCAN.

Pletismografia:
BTS OEP SYSTEM.

1.5.2 Biomedical

BTS ANYMOV, BTS DREAM, BTS GAITEMG, BTS GAITLAB, BTS GEMINI, BTS MOBIUS, BTS NIRVANA, BTS OEP SYSTEM e BTS TMJOINT.

1.5.3 Strumento di lavoro: il sistema SMART

SMART è il sistema di cattura del movimento (*Motion Capture*), accurato, flessibile e non invasivo progettato da BTS.

Grazie alla sua architettura innovativa e alla sua qualità nella calibrazione e negli algoritmi di ricostruzione tridimensionale SMART fornisce un' avanzata tecnologia di cattura del movimento all'industria, ai centri di ricerca e alle università.

SMART è un sistema di cattura del movimento potente, modulare e facile da usare.

Componenti del sistema

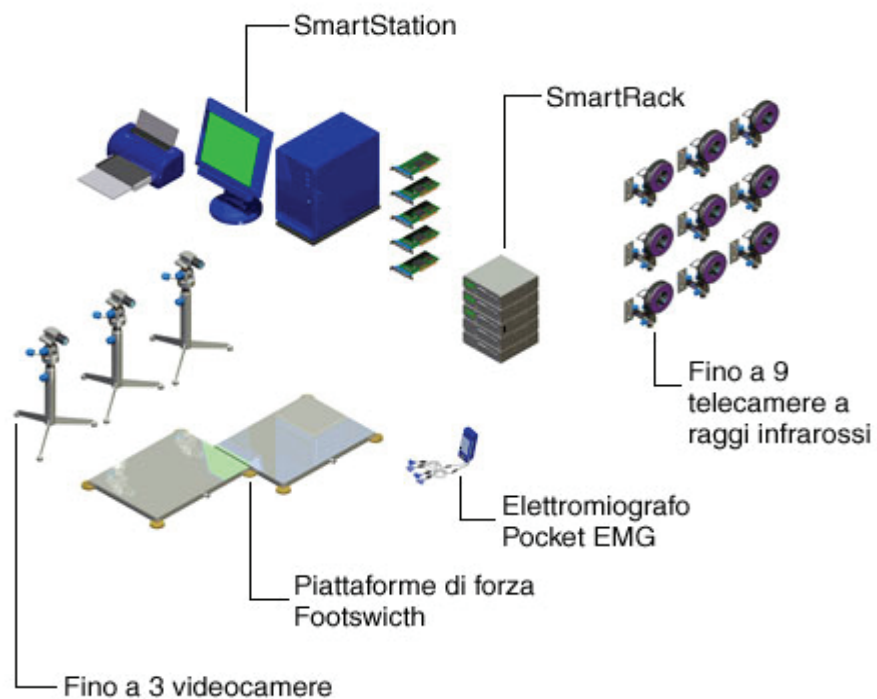


Fig 1.1 Componenti del sistema SMART.

SMART, con tutte le sue varie applicazioni, è stato lo strumento con cui ho interagito nell'arco di tutto il mio periodo di permanenza in azienda, per ottimizzare ed implementare i protocolli per l'analisi del movimento presi in esame.

Passiamo ora ad una breve descrizione dei principali componenti software di cui dispone il sistema:

SMART Capture

SMART Capture è l'applicazione del sistema che permette di acquisire immagini (statiche o dinamiche) per poterle poi analizzare. All'avvio di tale programma viene automaticamente

eseguito un check del sistema per controllare che tutte le telecamere a infrarossi siano correttamente impostate e collegate al calcolatore.

La procedura per l'acquisizione di immagini comincia con la calibrazione del sistema, operazione nella quale ci si serve di una terna (destorsa) di dimensione nota e di uno dei suoi assi estraibili per definire il volume in cui avverrà l'acquisizione (ovvero lo spazio fisico in cui verranno compiuti i movimenti da acquisire, nel nostro caso, lo spazio necessario al paziente per compiere alcuni passi).

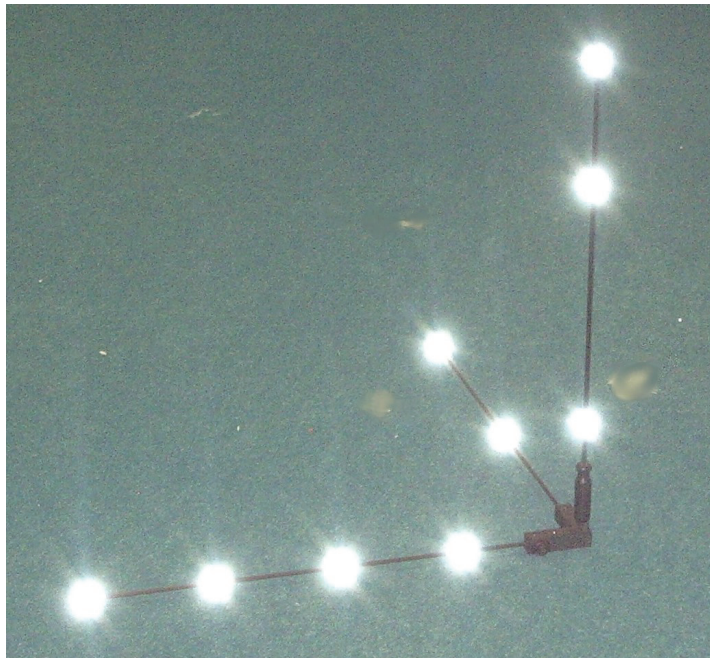


Fig 1.2. Terna utilizzata per la calibrazione del sistema.

Dopo aver definito le direzioni dei tre assi principali, base del sistema 3D, l'intero volume verrà "spazzolato" nelle tre direzioni (X, Y e Z), mediante l'asta di uno dei tre assi, estraibile dalla terna, per fornire un'indicazione alle telecamere a raggi infrarossi dell'entità di spazio che dovranno filmare. Dopo questa semplice, ma non banale, operazione, il sistema SMART è pronto per l'acquisizione di immagini. Ciò che le speciali telecamere registreranno,

saranno i *marker* ed i loro spostamenti; appariranno infatti sullo schermo solamente i punti che rappresentano le sfere riflettenti.

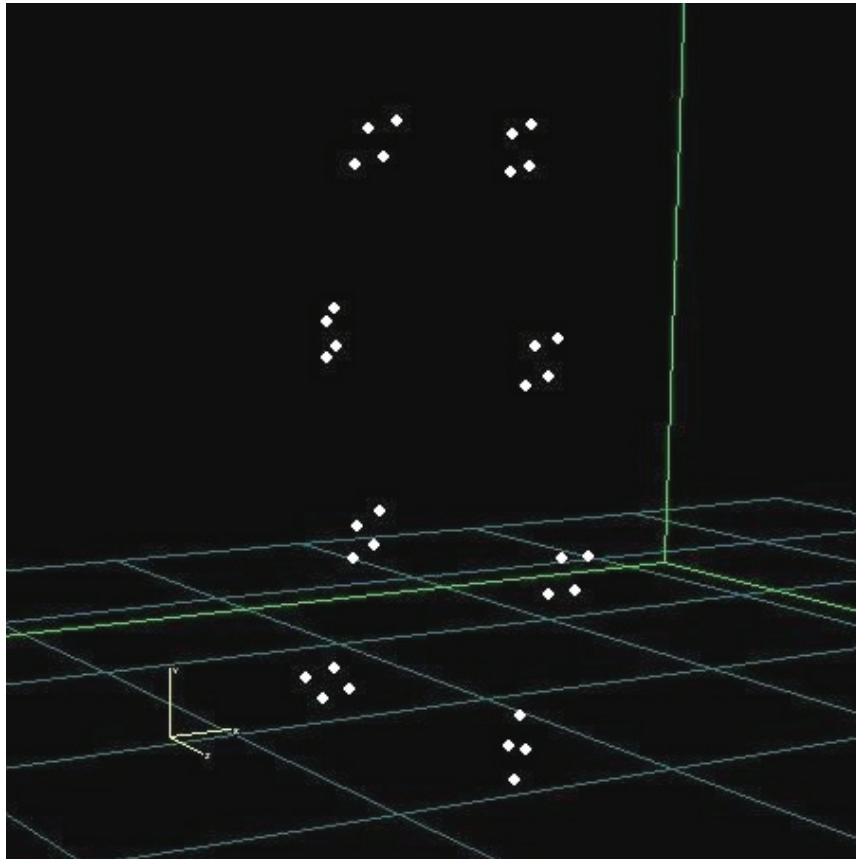


Fig 1.3 Immagine al 3D Viewer dell'acquisizione tramite telecamera a infrarossi. I punti bianchi indicano i marker (protocollo CAST [2]).

SMART Tracker

Questa applicazione permette di ricostruire la posizione tridimensionale di ogni *marker* a partire dalle immagini di ogni telecamera, acquisite mediante lo SMART Capture; consente inoltre di poter applicare un modello che assegna un nome a ciascun *marker* (che può indicare direttamente un punto di repere anatomico o un punto necessario alla

determinazione indiretta del punto di repere per mezzo di uno specifico protocollo di calcolo).

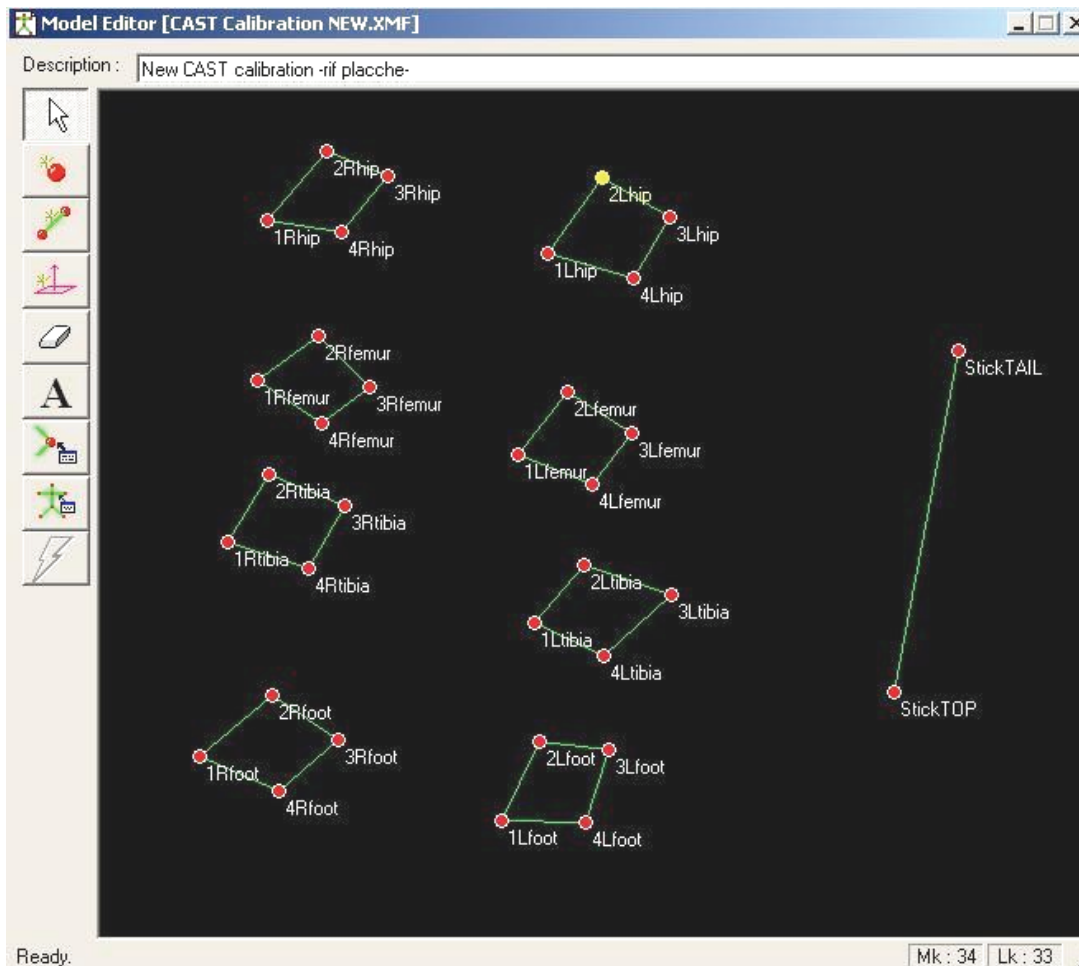


Fig 1.4 . Modello creato mediante SMART Tracker da applicare ai "dati grezzi" acquisiti.

Dopo aver creato il modello che soddisfa alle nostre esigenze, possiamo mediante qualche semplice operazione, accoppiare i singoli punti di tale schema ai *marker* rappresentati nel file dell'acquisizione (*labelling*).

I *file*, ricostruiti (*tracked*) e non, possono inoltre essere aperti e dunque visti con un'altra applicazione, o per meglio dire, un accessorio di SMART: **SMART Viewer**. Tale

applicazione consente di visionare e di poter cambiare le impostazioni di visualizzazione delle immagini acquisite.

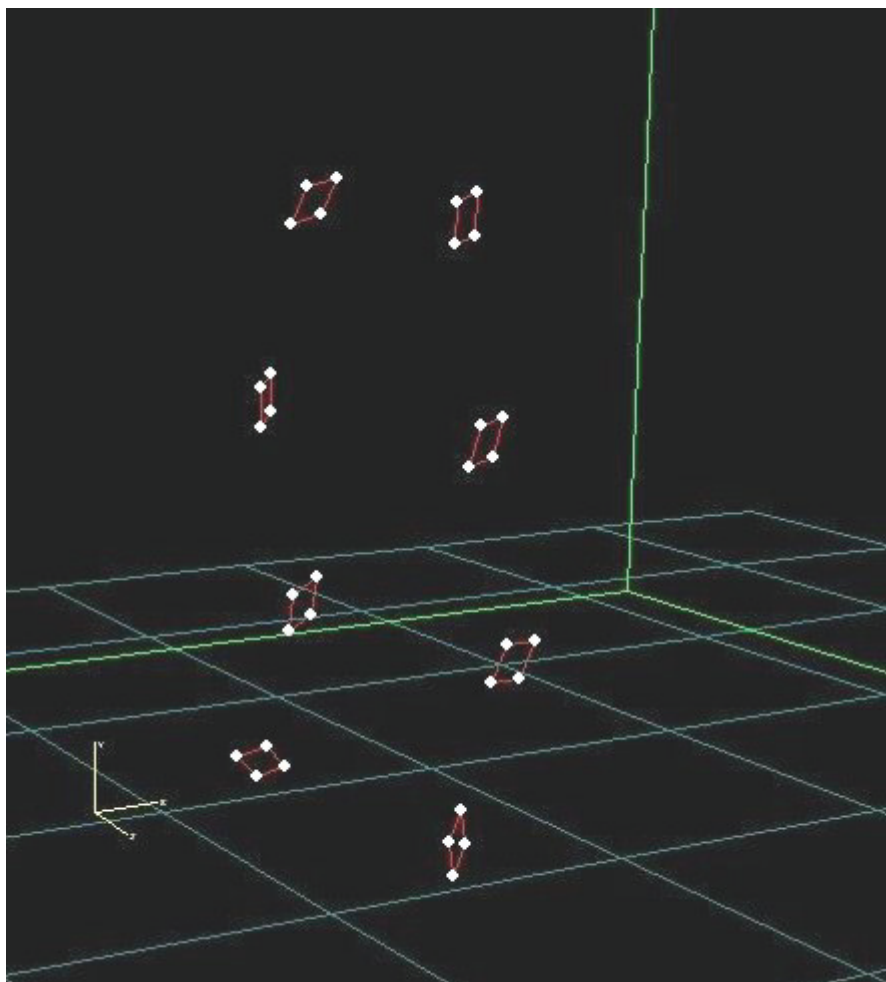


Fig 1.5 File "tracked", ovvero ricostruito, al quale è stato applicato il modello visto in Fig 1.4 (modello del protocollo CAST [2]).

SMART Analyzer

Lo SMART Analyzer è il software con il quale ho lavorato durante la maggior parte del mio tirocinio.

Analyzer è una soluzione completa per l'analisi biomeccanica del movimento con integrazione di dati cinematici 3D, video e analogici provenienti da piattaforme di forza, elettromiografi od altri dispositivi.

Da un punto di vista biomeccanico il software permette di costruire uno schema di calcolo che genera tutti i dati necessari all'utente per una completa analisi del gesto motorio. Permette di sviluppare protocolli di analisi con estrema facilità, flessibilità ed efficacia grazie alla semplicità dell'interfaccia a blocchi ed alla potenza del motore di calcolo, che si avvale delle librerie IPP di Intel per l'elaborazione numerica dei segnali.

La presentazione e la stampa dei risultati sono definibili dall'utente in ogni aspetto; il motore grafico integrato è in grado di produrre automaticamente presentazioni multimediali in formato HTML senza vincoli di impaginazione.

È facilmente integrabile con altri sistemi di *Motion Capture* e con le più comuni applicazioni; grazie all'ampia varietà di formati supportati, consente di importare dati acquisiti con altri sistemi o elaborati in Matlab, di esportare dati e presentazioni in Excel, Word, PowerPoint.

Possiamo così riassumere le più importanti ed utili caratteristiche che lo SMART Analyzer ci mette a disposizione:

- Generazione passo-passo di tutti i dati biomeccanici per mezzo di un'interfaccia grafica a blocchi intuitiva e con semplici operazioni di *drag&drop*.

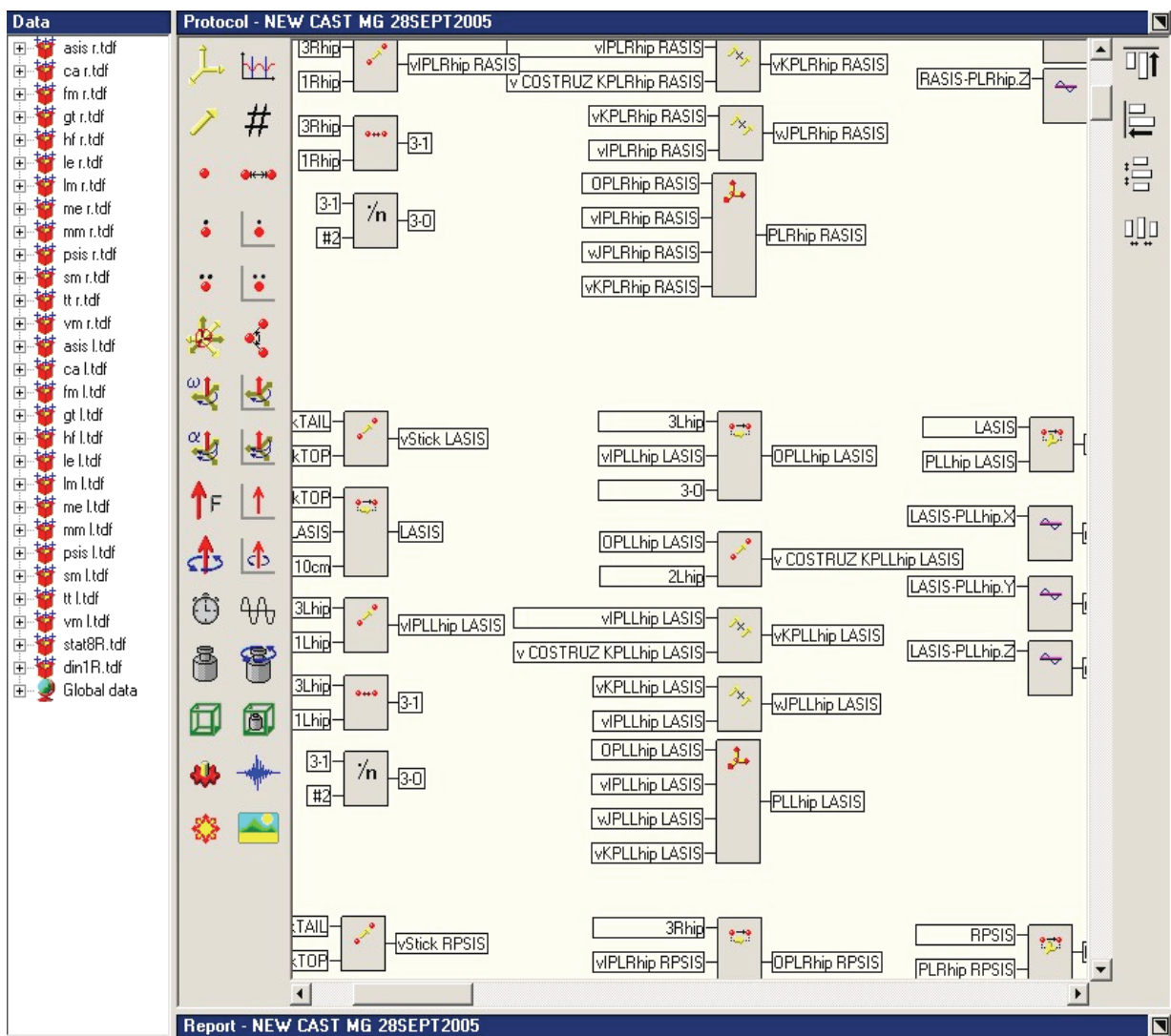


Fig 1.6 Operatori e finestra dell'ambiente di sviluppo di SMART Analyzer; ben riconoscibile l'interfaccia a blocchi con cui implementare il protocollo.

- Gestione di tutti i tipi di dati di interesse biomeccanico: distanze, angoli, velocità, accelerazioni (lineari e angolari), forze, momenti, potenze, etc.
- Rappresentazione di tutti i tipi di dati per mezzo di visualizzatori tridimensionali, di grafici e di tabelle numeriche

- Implementazione di tutte le tecniche più utilizzate di interpolazione, *smoothing* e filtraggio di tutti i tipi di segnali.
- Possibilità di generare sistemi di riferimento anatomici diversi da quello di laboratorio, che permettono all'utente di analizzare e presentare i dati in diversi sistemi di coordinate.
- Analisi temporale dei segnali che consente all'utente di definire manualmente (oppure con tecniche automatiche) eventi durante l'acquisizione per l'analisi di gesti ripetuti in un dominio normalizzato (es: ciclo del passo).
- Possibilità di *import/export* e di archiviazione di diversi formati di file, di testo ed altri formati standard (c3d, ASCII).
- Possibilità di costruzione e gestione di fasce di normalità che permettono di raccogliere, salvare e confrontare dati ottenuti da gruppi omogenei di pazienti per analisi di confronto.
- Possibilità di impostare diverse unità di misura per ogni protocollo.
- Il modulo di reportistica permette di rappresentare tutti i dati con una grafica vettoriale (SVG); gli oggetti utilizzabili sono grafici e ciclogrammi, tabelle, caselle di testo, immagini e filmati.

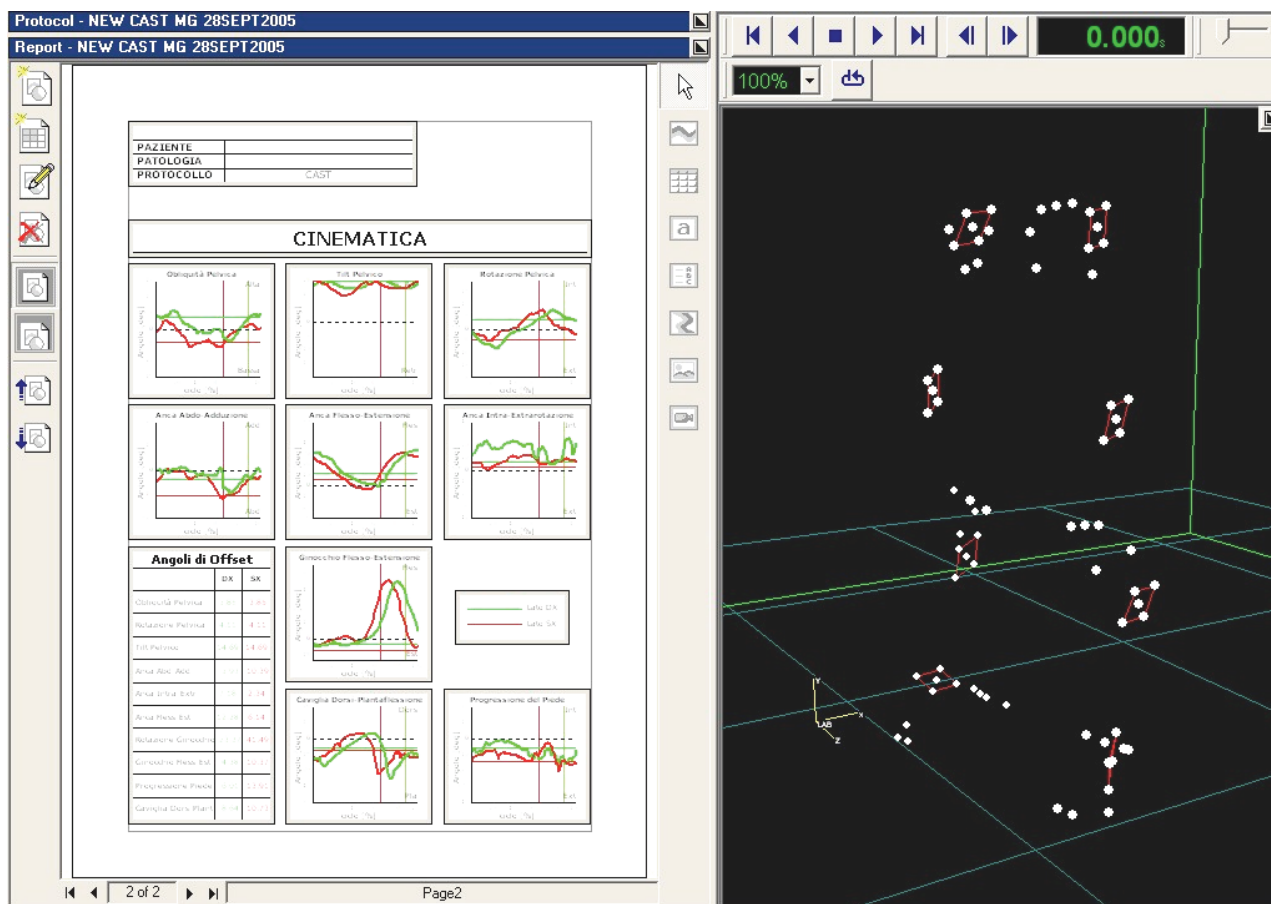


Fig 1.7 Report Clinico e 3D Viewer all'interno dello SMART Analyzer.

- Definizione del report con semplici movimenti del mouse, tramite *drag&drop* degli oggetti; ogni oggetto può essere ridimensionato, mosso o copiato a piacimento all'interno di una pagina o da una pagina all'altra.
- Il report può essere stampato o salvato in HTML o PDF, ed i singoli oggetti possono essere esportati in altre applicazioni (Word o PowerPoint).

2 L'ANALISI DEL MOVIMENTO

2.1 Introduzione

Il movimento umano è il risultato di un complesso processo di elaborazione di segnali eseguito sotto il controllo del sistema nervoso centrale. L'analisi del cammino deve quindi permettere un'analisi di tipo multifattoriale correlata di parametri neuromuscolari e biomeccanici.

Lo scopo è quello di potenziare e facilitare l'attività diagnostica attraverso la documentazione numerica a supporto del medico per ottimizzare la scelta del trattamento da applicare al paziente e come strumento di valutazione nel tempo dell'efficacia del trattamento applicato, sia chirurgico (pre e post-operatorio) che riabilitativo.

2.2 Analisi cinematica

L'acquisizione dei dati viene effettuata tramite un sistema optoelettronico a raggi infrarossi. L'analisi si basa sul riconoscimento e ricostruzione tridimensionale di marker passivi posizionati su punti di repere anatomico. Questo consente di ottenere informazioni quali traiettorie, velocità, il calcolo degli angoli articolari nei tre piani principali (sagittale, trasversale e frontale).

2.3 Analisi video

Complementare all'analisi cinematica, la ripresa video del soggetto fornisce informazioni qualitative di supporto all'indagine clinica. Pur non fornendo dati numerici, il video rappresenta una registrazione permanente del movimento, utile quindi per l'osservazione ripetuta del paziente da parte del medico, per documentare l'evoluzione delle performance motorie ed eventualmente per fornire alla famiglia e al paziente stesso una evidenza dei

miglioramenti e dell'efficacia del trattamento, attraverso un metodo di immediata comprensione.

2.4 Analisi cinetica

L'uso di piattaforme di forza consente l'analisi delle reazioni vincolari al terreno.

La forza misurata in combinazione con l'analisi cinematica permette di studiare i momenti e le potenze sviluppate a livello delle articolazione.

2.5 Analisi elettromiografica dinamica

Si basa sul prelievo di segnale elettromiografico attraverso un'elettromiografo di superficie (EMG). Questo consente di ottenere informazioni sullo stato di attivazione muscolare funzionale al movimento; registra gli interventi muscolari definendone la sequenza, il momento d'intervento, la durata, e entro certi limiti l'intensità senza nessuna invasività. Particolarmente indicata nell'analisi del cammino, fornisce molte informazioni utili anche sulle strategie di controllo del movimento dell'arto superiore da parte del sistema nervoso centrale.

2.6 Principali componenti di un sistema per l'analisi del movimento

2.6.1 Sistema optoelettronico

Il sistema optoelettronico è costituito da telecamere con illuminatore dotate di un sensore CCD sensibile alla radiazione luminosa infrarossa.



Fig 2.1 Telecamera a infrarossi con illuminatore.

I sistemi di *motion capture* si possono dividere in due grandi famiglie: i sistemi ottici (con o senza *marker*) e i sistemi non ottici (elettromeccanici, magnetici, inerziali, acustici e fibre ottiche).

Particolare attenzione viene posta nei sistemi ottici, che fanno uso di *marker* passivi, perché risultano i sistemi più accurati e diffusi, ma anche i più costosi.

Un sistema ottico per il *motion capture* è costituito da una set di videocamere (ad infrarossi) che riprendono la scena dove il soggetto si muove.

Ogni videocamera è descritta da un semplice modello matematico e l'immagine acquisita non è altro che una proiezione bidimensionale di una scena tridimensionale. In pratica tutti i raggi luminosi passano dal centro ottico dell'obiettivo prima di arrivare sul sensore della fotocamera.

I *marker*, di forma sferica o semisferica, vengono posti sul soggetto in esame e l'infrarosso riflesso da questi viene visto dalle telecamere come punto luminoso sulla scena.

Grazie quindi all'utilizzo combinato di flash e *marker* riflettenti, è possibile generare immagini ad alto contrasto dove è facile identificare i *marker* stessi.

Il sistema di *motion capture* ottico ricostruisce la posizione tridimensionale del marcatore in ogni istante di tempo.

Il sistema, che deve essere composto da almeno due telecamere, è in grado, attraverso la cosiddetta procedura di triangolazione, di combinare le immagini bidimensionali provenienti da ogni telecamera ed elaborare un'immagine tridimensionale

Per effettuare la ricostruzione della posizione tridimensionale di un *marker*, la posizione e l'orientamento di ogni videocamera devono essere noti.

Questi ed altri parametri che descrivono il processo di proiezione su ogni telecamera, indispensabili per la ricostruzione tridimensionale, vengono calcolati nella fase di calibrazione del sistema.

2.6.2 Calibrazione delle telecamere

La calibrazione del sistema consiste nella determinazione dei parametri geometrici delle telecamere, operazione necessaria per la ricostruzione della scena tridimensionale. I parametri geometrici si dividono in parametri interni, quali la lunghezza focale, le coordinate

del punto principale e i coefficienti di distorsione, e i parametri esterni ovvero la posizione del sistema di riferimento della telecamera rispetto al sistema di riferimento assoluto.

Operativamente i parametri di calibrazione stabiliscono le seguenti trasformazioni:

- una trasformazione di coordinate dal sistema assoluto al sistema di coordinate della camera localizzato nel suo centro di prospettiva;
- una trasformazione prospettica dallo spazio 3D allo spazio 2D della camera;
- una trasformazione 2D dal sistema di coordinate del piano immagine al sistema di riferimento del sensore.

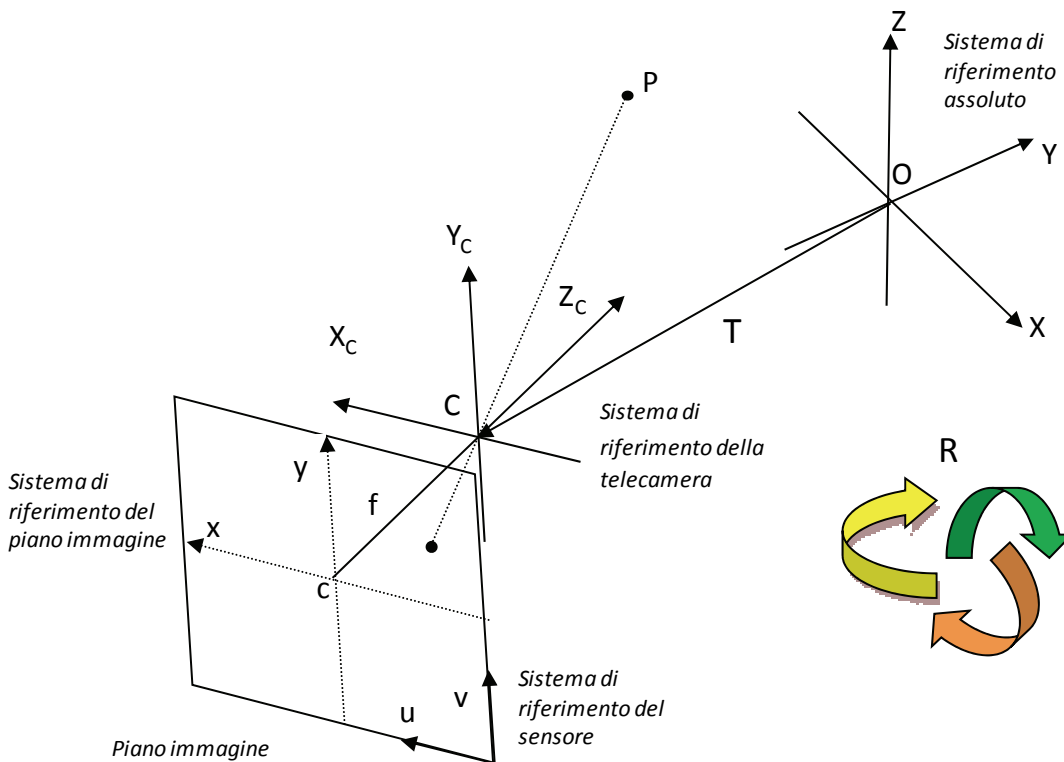


Fig. 2.2 Proiezione sul piano immagine di un punto P nello spazio 3D.

Il primo passo verso la calibrazione del sistema è quindi quello di definire un modello matematico delle telecamere stesse, come già accennato in precedenza. La maggior parte delle tecniche di calibrazione utilizzano il cosiddetto modello delle telecamere a foro stenopeico (*pin - hole*), in cui si modella l'ottica come un foro di diametro infinitesimo posto nel centro di prospettiva. Un raggio di luce proveniente dal punto P dello spazio attraversa il foro e incide sul piano immagine in un punto p .

Considerando una terna cartesiana con l'origine nel centro di prospettiva della camera e l'asse Z coincidente con l'asse ottico, per similitudine si ottiene la seguente relazione tra le coordinate (x_p, y_p) , espresse nel sistema di riferimento del piano immagine, e (X_p, Y_p, Z_p) , espresse nel sistema di riferimento della camera (C, X_c, Y_c, Z_c) , dei punti p e P rispettivamente:

$$\begin{pmatrix} x_p \\ y_p \end{pmatrix} = -f \begin{pmatrix} \frac{1}{z_p} & 0 \\ 0 & \frac{1}{z_p} \end{pmatrix} \begin{pmatrix} X_p \\ Y_p \end{pmatrix} \quad (1.1)$$

Dove f è la lunghezza focale, ovvero, la distanza del centro di prospettiva della camera dal piano immagine. La formula (1.1) può essere riscritta in coordinate omogenee e diventa:

$$\lambda \begin{pmatrix} x_p \\ y_p \\ \mathbf{1} \end{pmatrix} = \begin{pmatrix} -f & 0 & 0 & 0 \\ 0 & -f & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix} \begin{pmatrix} X_p \\ Y_p \\ Z_p \\ \mathbf{1} \end{pmatrix} \quad (1.2)$$

Il sensore della telecamera ha un proprio sistema di riferimento centrato sull'angolo inferiore destro del piano immagine, nel quale sono espresse le coordinate 2D in uscita dalla camera. Date le dimensioni orizzontale e verticale del pixel (k_u, k_v) e le coordinate del punto principale (u_o, v_o) , le coordinate (u, v) del punto p nel sistema di riferimento del sensore saranno:

$$p = \begin{pmatrix} u \\ v \\ 1 \end{pmatrix} = \begin{pmatrix} 1/k_u & 0 & u_0 \\ 0 & 1/k_v & v_0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} x_p \\ y_p \\ 1 \end{pmatrix} \quad (1.3)$$

Essendo poi il punto P originariamente espresso rispetto al sistema di riferimento assoluto (O, X, Y, Z) si ha:

$$P_p = \begin{pmatrix} X_p \\ Y_p \\ Z_p \\ 1 \end{pmatrix} = \begin{pmatrix} R & T \\ 0 & 1 \end{pmatrix} \begin{pmatrix} X_a \\ Y_a \\ Z_a \\ 1 \end{pmatrix} \quad (1.4)$$

Dove il vettore T e la matrice di rotazione R esprimono rispettivamente la traslazione e l'orientamento del sistema di riferimento della camera rispetto al sistema di riferimento assoluto e P_p è il punto P espresso nel sistema di riferimento della telecamera.

Il modello della telecamera *pin - hole* può essere quindi rappresentato come una matrice A di dimensioni 3×4 ottenuta come composizione delle tre precedenti trasformazioni:

$$A = \begin{pmatrix} 1/k_u & 0 & u_0 \\ 0 & 1/k_v & v_0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} -f & 0 & 0 & 0 \\ 0 & -f & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix} \begin{pmatrix} R & T \\ 0 & 1 \end{pmatrix} = HMD \quad (1.5)$$

La limitazione principale di questo approccio è che l'intensità della luce che attraversa il foro e che giunge sugli elementi fotosensibili del piano immagine è troppo piccola per essere rilevata, per cui è necessario allargare il foro (diaframma) e ricorrere ad un'ottica per mettere a fuoco l'immagine.

Tuttavia questo strumento introduce ulteriori fattori di deviazione dal modello ideale di proiezione, per cui l'immagine viene deformata a causa di distorsioni cromatiche (qualità o dettaglio dell'immagine) e geometriche (spostamento del contenuto immagine).

Esistono poi specifici modelli che permettono la stima di tali distorsioni.

Il passo successivo ,nel processo di calibrazione delle telecamere, prevede la determinazione dei parametri geometrici delle telecamere che implica l'utilizzo di un insieme di punti di controllo distribuiti internamente al volume di calibrazione.

Diversi sono i metodi di soluzione esistenti: alcuni richiedono la soluzione in forma chiusa delle equazioni di collinearità (equazioni 1.5), assumendo note le coordinate dei punti di controllo, altri utilizzano punti di controllo di coordinate non note e parametri di calibrazione che vengono stimate iterativamente, altri ancora sfruttano metodi basati sulla geometria epipolare che non richiedono la conoscenza delle coordinate nello spazio 3D dei punti di controllo e utilizzano soluzioni lineari.

2.6.3 Ricostruzione e *tracking*

Dopo aver concluso la parte di calibrazione delle telecamere è possibile ricostruire la posizione dei *marker* nello spazio. Per la ricostruzione 3D sono necessari almeno due punti 2D Il punto di partenza sono le coordinate delle proiezioni nei sistemi di riferimento del piano immagine (x,y) , il punto di arrivo le coordinate del *marker* nello spazio 3D (X, Y, Z) .

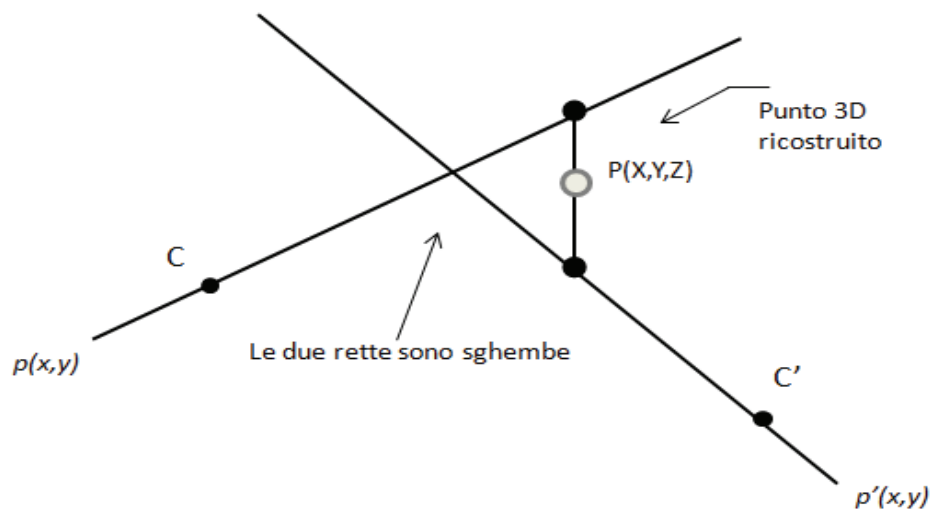


Fig 2.3 Ricostruzione 3D tramite triangolazione.

Una volta ricostruita ad ogni istante di tempo la posizione 3D di ciascun *marker*, il problema successivo è calcolarne la traiettoria (*tracking*) che rappresenta uno dei problemi più complessi di tutta l'analisi del movimento.

Si possono utilizzare due tipi di informazioni a priori per risolvere il problema:

- 1) la regolarità della traiettoria;
- 2) informazioni a priori sulla forma e sul tipo di moto del soggetto.

Per poter sfruttare l'informazione di tipo **1**) si utilizzano stimatori ricorsivi dello stato di sistemi dinamici come il filtro di Kalman. Questi algoritmi sono strutturati in due passi, uno di predizione e uno di aggiornamento.

Nel passo di predizione l'algoritmo calcola la posizione attesa del marcatore, in base alle precedenti, al modello dinamico ed alla varianza della predizione, per cui è possibile calcolare anche la verosomiglianza di ciascuna misura.

Tali algoritmi, tuttavia, sono computazionalmente pesanti e quindi spesso si ricorre a soluzioni subottime che, nella maggior parte dei casi, risultano più adeguate.

L'informazione di tipo **2)** può essere di vari tipi e perciò è difficile sviluppare algoritmi adeguati per applicazioni diverse.

In alcune scene i *marker* possono essere disposti su dei corpi rigidi e in questo caso le distanze tra i *marker* e gli angoli sono invarianti del moto che possono essere utilizzati per aiutare a risolvere il problema dell'associazione.

Si può definire un concetto statistico di forma tramite la densità di probabilità congiunta della posizione relativa dei *marker* e della loro velocità. Ci sono però due problemi per utilizzare tale descrizione di forma, la sua complessità che cresce esponenzialmente col numero di marcatori, e l'apprendimento automatico della forma.

Per rendere il problema trattabile, quindi, si può sfruttare il fatto che il corpo umano è una catena cinematica ed è ragionevole pensare che ci sia un certo grado di indipendenza del moto, ad esempio del polso rispetto al resto del corpo, non appena sia noto il moto del gomito e spalla. Tale approssimazione può essere estesa a tutto il resto del corpo costruendo quindi un opportuno grafo fra le parti del corpo.

Infine, viene applicato un modello che assegna ad ogni traiettoria ricostruita uno specifico significato anatomico.

Una volta ottenute le coordinate istantanee tridimensionali, e quindi le traiettorie, dei marcatori è possibile stimare la cinematica articolare che comporta, per definizione, la

ricostruzione della posizione e dell'orientamento relativo dei sistemi di riferimento solidali con il segmento osseo sotto esame.

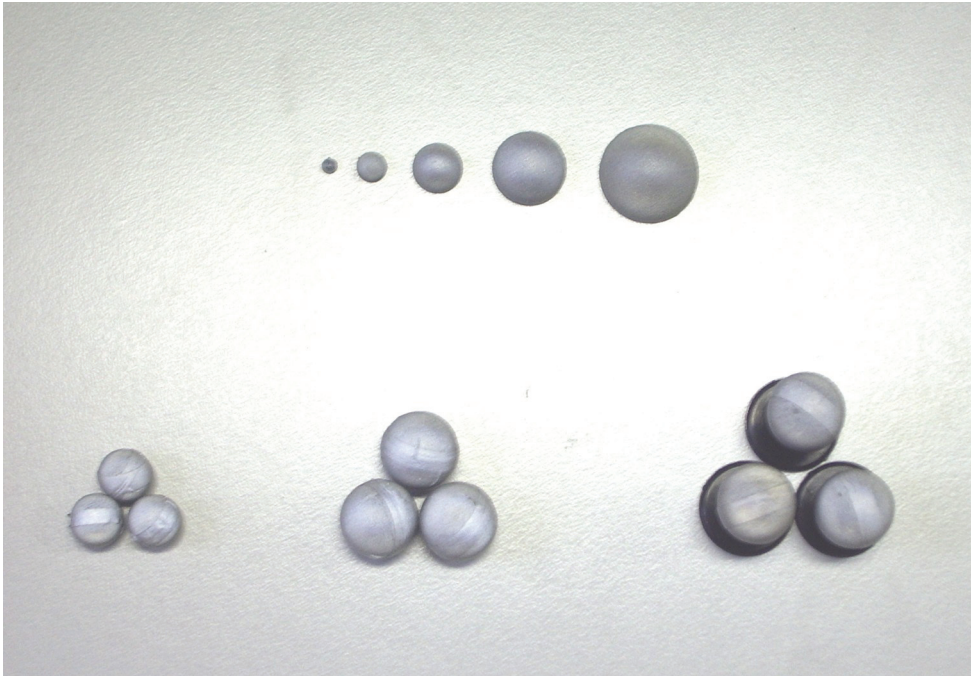


Fig 2.4. Marker di varie dimensioni semisferici, sferici e sferici con supporto.

Registrando la posizione 3D dei *marker* in ogni istante, si ottengono le traiettorie e, per derivazione, le informazioni cinematiche di velocità ed accelerazione.

2.6.4 Piattaforme di forza

Per la misurazione delle forze ci si avvale di strumenti specifici che prendono il nome di dinamometri. In ogni tipo di misurazione si deve cercare di porsi, per quanto possibile, in condizioni sperimentali note e riproducibili. Nel contesto della biomeccanica del movimento, questo principio può essere soddisfatto quando l'obiettivo della misura è la caratterizzazione o la valutazione funzionale di organi di moto (muscoli, articolazioni, complessi muscolari e articolari). A tal fine si possono ideare strumenti di misura che sono

parte, o realizzano essi stessi, ambienti particolari, che impongono alla struttura muscolo-scheletrica posizioni, leggi di moto, o forze note e controllate con accuratezza. In queste condizioni può essere possibile utilizzare modelli fisico/matematici delle strutture in esame relativamente semplici e tuttavia efficaci per una stima accurata delle forze. Una seconda opzione, preferibile alla precedente, è quella della strumentazione dell'ambiente, in cui il soggetto esegue liberamente le azioni motorie senza costrizioni, in quanto l'ambiente è quello nel quale si svolge la vita quotidiana o una sua riproduzione in laboratorio.

Nel caso dell'analisi del cammino è possibile utilizzare delle pedane di forza poste su un camminamento appositamente predisposto, non perturbando la libera espressione dell'atto motorio.

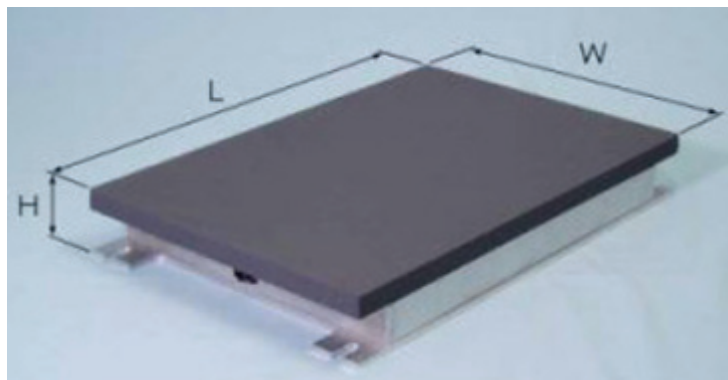


Fig 2.5 Pedana di forza.

Le pedane di forza sono costituite da quattro celle di carico, ognuna delle quali è posta in corrispondenza di un angolo. Esse sono costituite da tre trasduttori di forza, ciascuno dei quali è idealizzato e progettato per poter rilevare una sola delle tre componenti di forza o momento.

I trasduttori di forza, noti anche come celle di carico, impiegano sensori che convertono la forza applicata in una deformazione che, a loro volta, producono un segnale elettrico di uscita. Le tecnologie più comunemente usate per la realizzazione di trasduttori di forza sono quelle basate su :

- Estensimetri (*strain gauge*): Convertono una variazione della lunghezza in un segnale elettrico mediante la variazione di resistenza.
- Trasduttori piezoelettrici: sfruttano la proprietà di alcuni materiali, tipicamente il quarzo, di generare una tensione quando vengono sottoposti a sollecitazioni meccaniche.

Le piattaforme di forza misurano la risultante della reazione del suolo al momento dell'impatto del soggetto. Le forze vengono analizzate nei tre piani fondamentali, scomposte nelle componenti verticale, antero-posteriore e medio-laterale.

Le forze misurate combinate con le informazioni cinematiche consentono il calcolo dei momenti e delle potenze angolari.

2.6.5 Elettromiografo

L'analisi elettromiografica rappresenta la manifestazione elettrica della contrazione muscolare. Le fibre muscolari eccitate dall'impulso del sistema nervoso attraverso la placca motrice, si contraggono. Se sulla superficie della cute vengono applicati due elettrodi bipolari è possibile osservare, durante la contrazione muscolare, una variazione della distribuzione di potenziale. Registrando questa variazione si ottiene un segnale indicativo dell'attività muscolare in funzione del movimento effettuato. L'utilizzo di elettrodi di superficie semplifica sensibilmente le operazioni di prelievo del segnale e, unitamente alla non-invasività della tecnica, rende possibile l'effettuazione di registrazioni sia in condizioni

di contrazione isometrica sia in sforzo dinamico, ad esempio durante l'esecuzione di esercizi o gesti funzionali.

2.6.6 Video Controller

Sistema di telecamere video per la ripresa del soggetto da differenti angolazioni. Un *hardware* dedicato permette la gestione fino a quattro telecamere contemporaneamente, combinando e comprimendo in *real time* i differenti flussi video, in maniera sincrona ai segnali cinematici ed analogici.

3 L'ATTIVITÀ DI TIROCINIO

Nel corso del tirocinio presso la sede Ricerca e Sviluppo di BTS il compito era quello di migliorare ed implementare dei protocolli presenti in letteratura sviluppati per l'analisi del movimento, nella fattispecie, per l'analisi della cammino.

3.1 Presentazione e obiettivi del progetto

L'attività di tirocinio può essere descritta distinguendo tre fasi distinte.

Una prima fase ha previsto l'utilizzo e la conoscenza del prodotto principale sviluppato da BTS: il sistema di acquisizione optoelettronico SMART.

La fase successiva prevedeva la raccolta di informazioni riguardanti l'analisi del movimento, del cammino in particolar modo.

La terza parte previsto era dedicata dapprima all'analisi del protocollo Davis [1] già sviluppato in azienda, al fine di migliorare la sua implementazione nel software di analisi Smart Analyzer, e successivamente alla costruzione di un ulteriore protocollo per l'analisi del cammino (ovvero l'implementazione del codice software necessario): il CAST [2]).

3.2 Descrizione del codice sviluppato durante il tirocinio

Il primo periodo è stato speso per l'acquisizione di oggetti elementari con SMART e la ricostruzione dei "dati grezzi" mediante SMART Tracker.

Il passo successivo è stato quello di analizzare, studiare e comprendere la costruzione del protocollo Davis [1] di già implementato precedentemente tramite Analyzer.

Il codice sviluppato mediante SMART Analyzer è costituito da un flusso di dati in entrata e uscita (*input/output*) a schemi a blocchi, cosicché semplicemente dalle coordinate 3D dei

punti corrispondenti ai *marker* (o ai punti di repere nel caso del protocollo CAST [2]), si riescono a calcolare varie grandezze utili nella prassi clinica, come nel nostro caso, alcuni angoli caratteristici quali intra-extrarotazioni, addu-abduzioni e flesso-estensioni delle singole articolazioni.

Nell'appendice A è riportato parte del codice sviluppato in versione .xml.

3.3 Sviluppo del protocollo Davis [1]

3.3.1 Descrizione protocollo Davis [1]

Tale protocollo, attualmente il più diffuso ed utilizzato in ambiente clinico per via della relativa semplicità con cui può essere applicato, è stato sviluppato nell'ospedale Newyorkese "Helen Hayes" all'inizio degli anni '80. I punti di repere che caratterizzano questo protocollo sono quindici: sette per la parte destra (la spina iliaca anteriore superiore, un riferimento solidale al femore, l'epicondilo femorale, un riferimento solidale alla tibia, il malleolo, il tallone e la testa del metatarso), gli stessi sette per la parte sinistra ed il sacro.

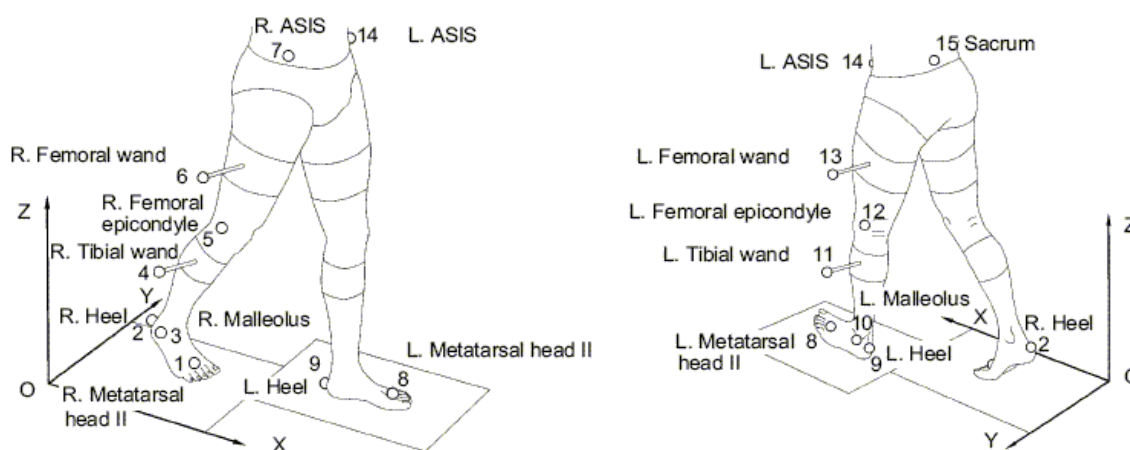


Fig 3.1 Disposizione dei marker secondo il protocollo Davis [1].

3.3.2 Implementazione

L'ottimizzazione del protocollo precedentemente sviluppato in azienda mediante SMART Analyzer ha previsto principalmente due punti:

- 1) ridurre le operazioni di rotazione applicate ai sistemi di riferimento costruiti, ovvero per passare dai sistemi di riferimento tecnici (utilizzati solamente in fase di costruzione) a quelli anatomici (i veri e propri sistemi considerati poi nel calcolo di angoli, traiettorie, velocità, accelerazioni e quant'altro);
- 2) eliminare l'uso di tabelle (che dovevano essere richiamate ogni qualvolta volesse esser aperto il protocollo, facendo così diventare laboriosa la fase di apertura e caricamento del protocollo stesso), immettendo speciali operatori di input, all'interno del codice stesso.

Per attuare il primo di questi due punti atti ad ottimizzare il protocollo è stato necessario, in particolare, l'utilizzo di matrici di rotazione e di trasformazione per poter giungere in maniera più veloce ai sistemi di riferimento dei vari segmenti anatomici.

Si è trattato di un'operazione piuttosto laboriosa, che ha però portato come risultato finale un file più "leggero" e "snello" per quel che riguarda il numero di operatori impiegati (e dunque di risorse del calcolatore utilizzate).

Apportate le modifiche al protocollo che trattava la sola parte della cinematica, è stato modificato nello stesso modo anche al protocollo, più completo, che tratta anche la parte della cinetica.

Ultimo intervento sui due protocolli -cinetica e cinematica- Davis [1], è stato apportato alla grafica dei report clinici (cercando di uniformare lo stile e la rappresentazione degli

andamenti dei vari angoli, con quelli già presenti in letteratura) e generando infine le versioni italiana ed inglese di tali report.

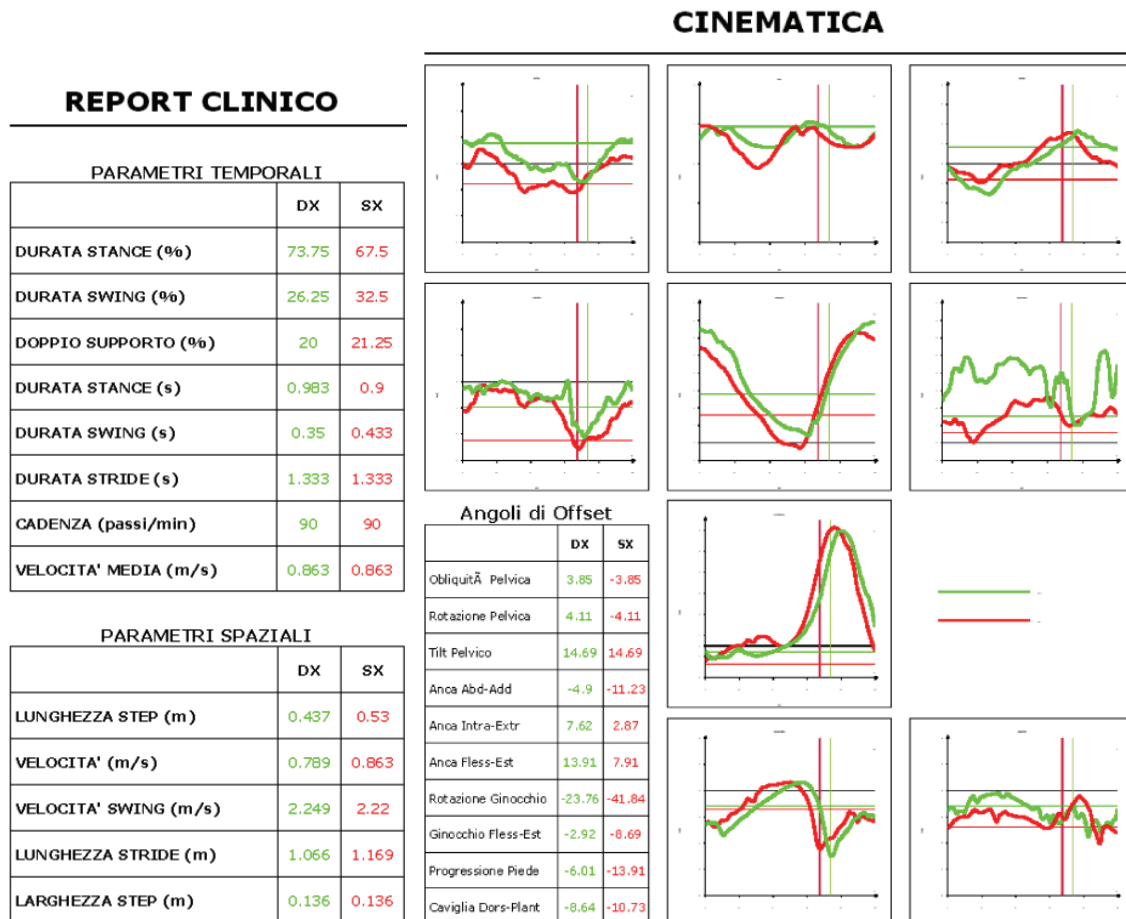


Fig 3.2 Nuova veste grafica della pagina di report.

3.4 Il protocollo CAST [2]

3.4.1 Descrizione protocollo CAST con sistemi di riferimento angoli e calibrazioni punti di repere

Dopo l'esperienza di sviluppo/ottimizzazione del protocollo Davis [1], si è passati all'implementazione del protocollo CAST [2], ovvero definire gli strumenti necessari per acquisire i dati e l'intera parte software per ricavare da tali dati le informazioni necessarie all'analisi del cammino.

Il CAST [2], acronimo di Calibrated Anatomical System Technique, è un protocollo messo a punto per la gait analysis dal Prof. Cappozzo a metà degli anni '90 e presenta una sostanziale rivoluzione rispetto a tutti gli altri protocolli proposti fino a quel momento da molti altri staff di ricerca in tutto il mondo.

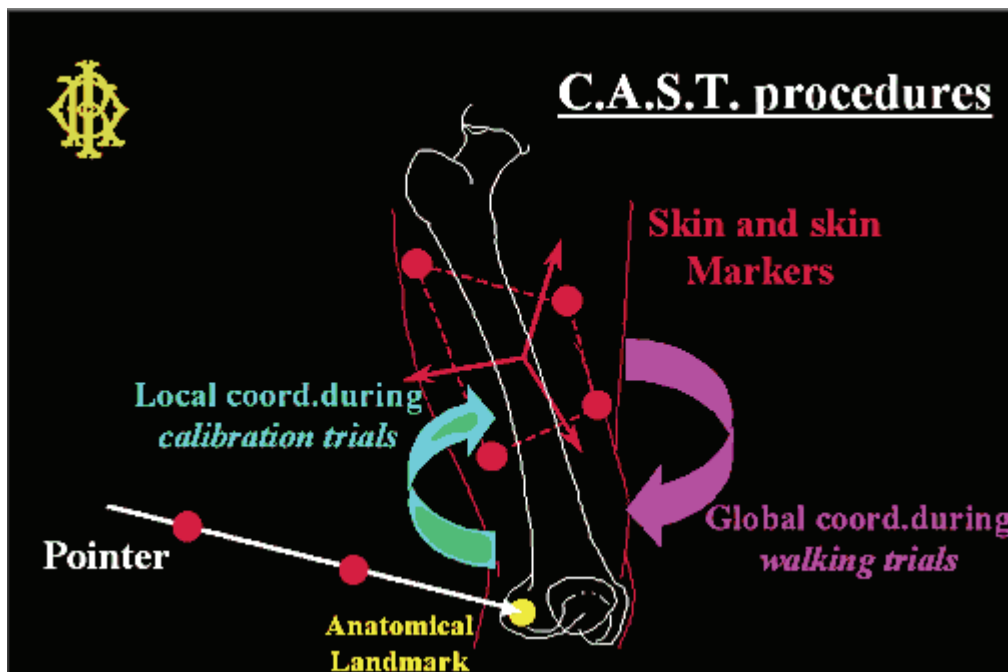


Fig 3.3 Procedura su cui si basa il protocollo CAST [2].

La novità sta appunto nella “calibrazione anatomica dei punti di repere anatomico”, procedimento durante il quale per mezzo di uno *stick* (ovvero un puntatore di precisione in cui siano stati messi almeno due *marker* e di cui siano note con esattezza le distanze tra la punta dello *stick* e il primo *marker* e tra il primo ed il secondo *marker*) un operatore andrà a definire con estrema precisione i punti di repere anatomici necessari a costruire poi i sistemi di riferimento dei vari segmenti corporei. Tale azione evita così di andare a porre dei *marker* in tali punti, eliminando così artefatti causati dallo scorrimento della pelle (*skin effect*). Gli unici *marker* ad essere impiegati in tale procedimento di acquisizione, non sono posti direttamente sulla pelle del paziente ma vengono posizionati su particolari placche, a gruppi di quattro.

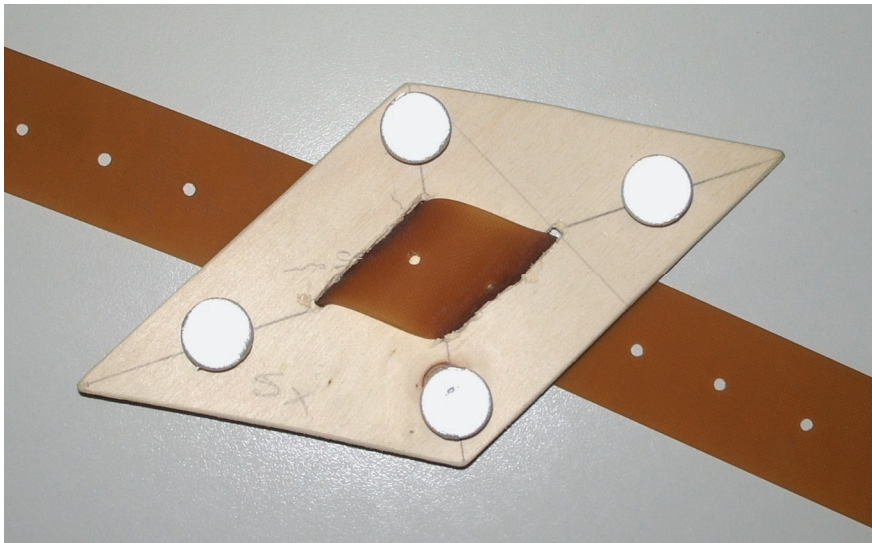


Fig 3.4 Placca rigida su cui sono posizionati i quattro *marker*, costruita per le acquisizioni CAST [2].

3.4.2 Acquisizioni su soggetti

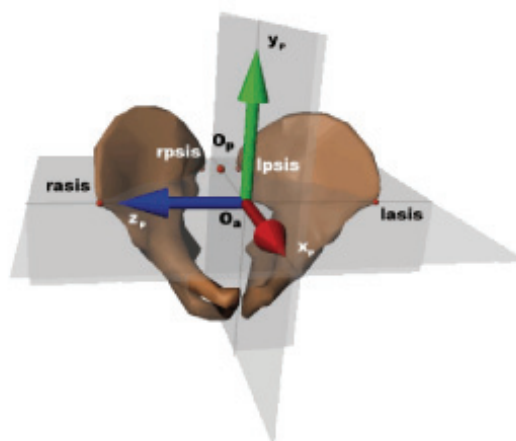
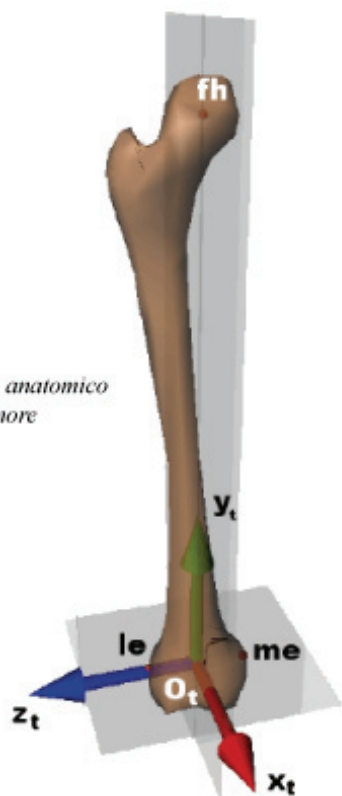
In totale andremo ad utilizzare trentadue *marker*, suddivisi in otto placche, quattro placche per ogni arto inferiore, ognuna delle quali verrà fissata in maniera tale da risultare solidale al

segmento corporeo corrispondente (bacino, coscia, gamba, piede). Ogni placca contiene quattro *marker* perché, come è noto, servono almeno tre punti per poter generare un piano nello spazio; in realtà dunque basterebbero tre *marker* per placca, ma ne è presente uno in più in caso durante l'acquisizione, uno di essi non venisse visto dalle telecamere: se ne fossero filmati solamente due, non sarebbe possibile ricostruire il piano su cui far giacere il sistema di riferimento della placca.

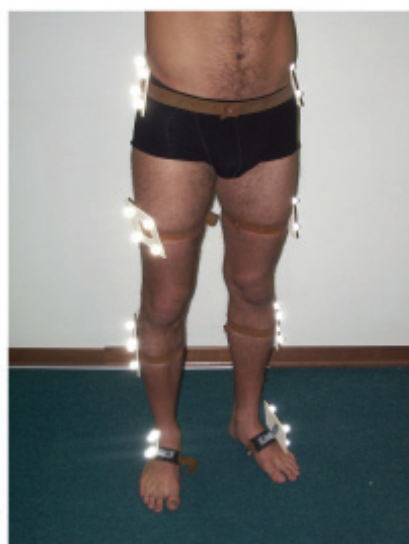


Fig 3.5 Disposizione delle placche rigide con i marker secondo il protocollo CAST [2].

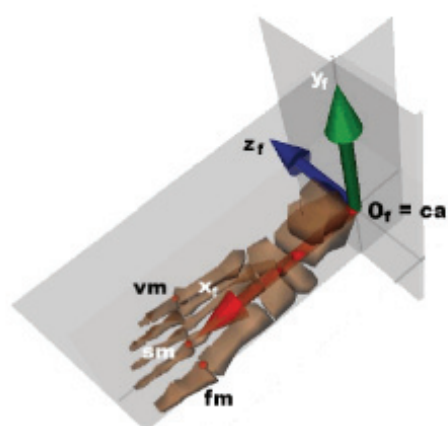
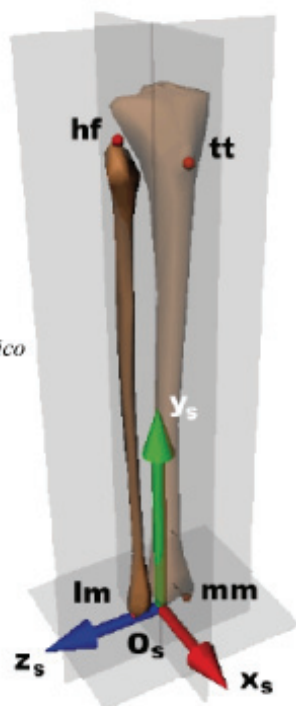
sistema di riferimento anatomico relativo al Femore



sistema di riferimento anatomico relativo al Pelvis



sistema di riferimento anatomico relativo a Tibia e Perone



sistema di riferimento anatomico relativo al Piede

Fig 3.6 Particolare dei sistemi di riferimento relativi ad i vari segmenti anatomici [6].

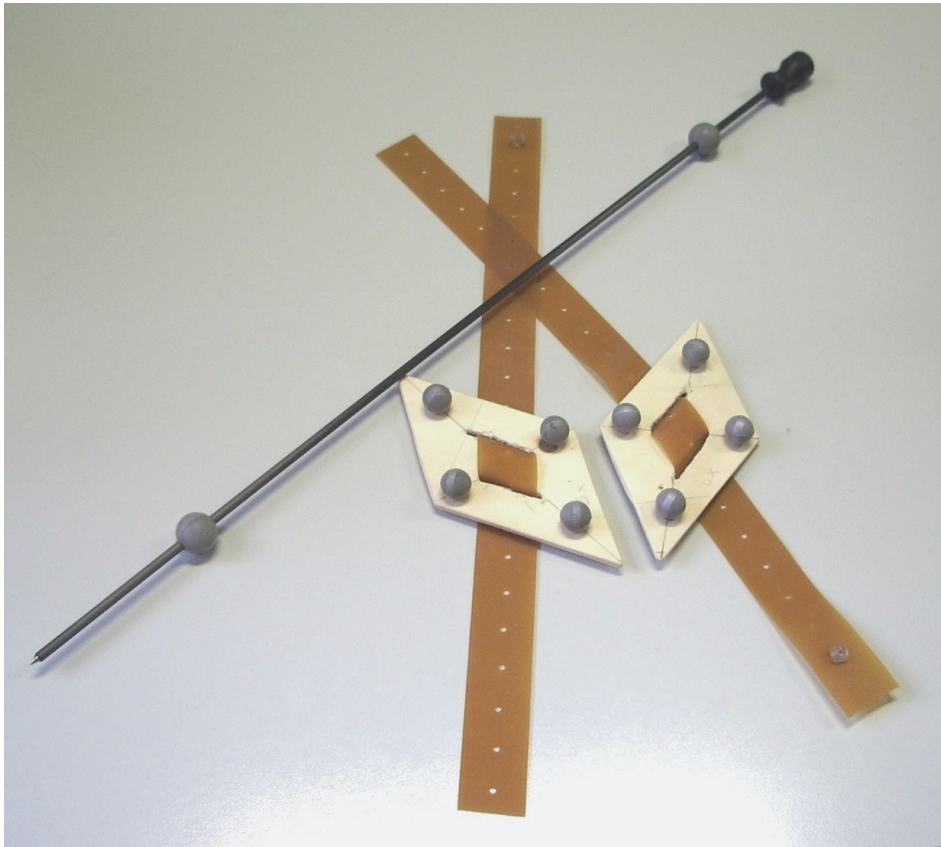


Fig 3.7. Materiale costruito per render approntabile il protocollo CAST [2]: placche rigide da fissare al paziente e stick necessario alla calibrazione anatomica.

Dovranno essere eseguite due tipologie differenti di acquisizioni: statiche e dinamiche; le prime, durante la calibrazione anatomica dei punti di reperi interessati, daranno le singole registrazioni dei ventisei punti di reperi necessari per la costruzione del protocollo (tredici per la parte destra ed altrettanti per la sinistra del corpo), mentre le acquisizioni dinamiche servono a registrare alcuni campioni di camminata dei soggetti.

Tutte le acquisizioni vengono salvate mediante SMART Capture; per quelle statiche sono salvati soltanto alcuni *frame* per ogni punto, così da poter ricostruire tramite SMART Tracker la placca di riferimento del segmento corporeo interessato e il vettore (ovvero la direzione data dai due *marker* presenti sul puntatore di precisione) che indica il punto

anatomico toccato dallo *stick*. Tramite questi dati (ricordando che sono note le distanze dei *marker* del puntatore) si possono ricostruire le esatte posizioni dei punti anatomici necessari alla costruzione del protocollo.

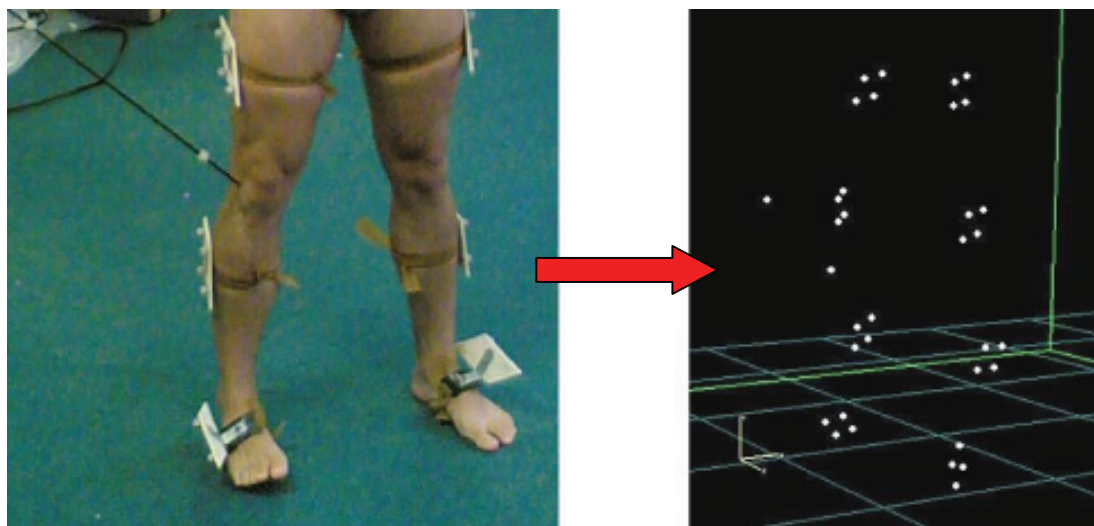


Fig 3.7 acquisizione statica e sua ricostruzione; si noti l'uso dello stick nella determinazione del punto di repera.

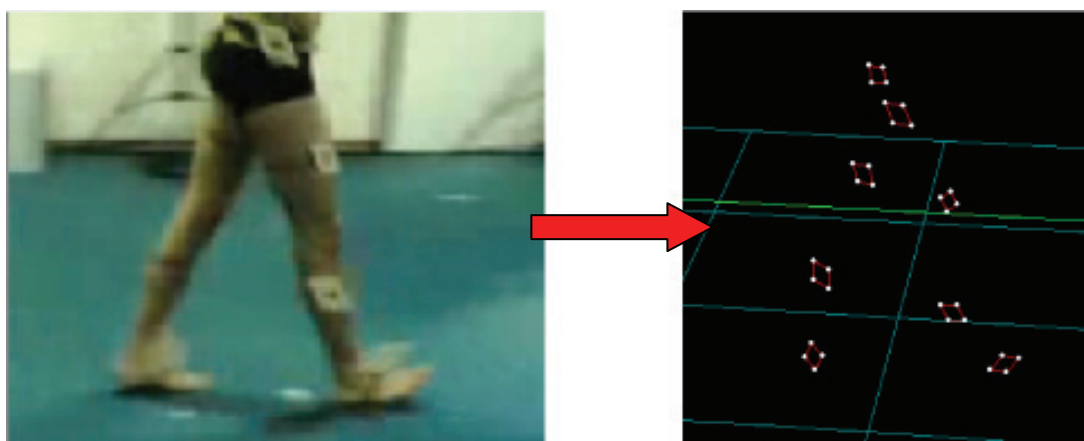


Fig 3.8 acquisizione dinamica e sua ricostruzione.

3.4.3 Implementazione

Una volta ottenuti i primi dati “grezzi”, questi devono essere opportunamente ricostruiti mediante l’applicazione SMART Tracker (applicando ai *file* il modello appositamente costruito, visibile in Fig 1.4), per poterli poi utilizzare in SMART Analyzer per l’implementazione della parte software del protocollo CAST [2].

Possiamo riassumere le operazioni compiute mediante sequenze di operatori, con i seguenti step:

- 1) determinare la posizione della punta dello *stick* (mediante i due *marker* presenti in esso e le distanze note a priori) nel riferimento del laboratorio (LAB);
- 2) determinare la posizione della punta dello *stick* nel riferimento della placca d’interesse;
- 3) determinare il punto di repere corrispondente allo *stick* (punto per punto) durante la calibrazione anatomica nel riferimento placca;
- 4) determinare il punto di repere nel riferimento LAB;
- 5) individuare tutte le coordinate dei punti di repere di ogni segmento come punta dello *stick* e ricostruire il sistema di riferimento del segmento stesso, prima in funzione del riferimento LAB e poi in funzione dei vari riferimenti anatomici;

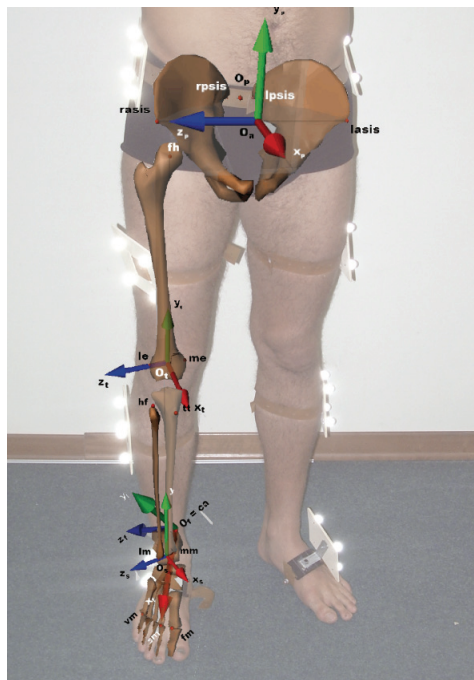


Fig 3.9 Sistemi di riferimento anatomici, sovrapposti all'immagine acquisita del soggetto.

- 6) Calcolare tutte le grandezze di interesse clinico (velocità, accelerazioni e angoli tra i vari segmenti corporei, ovvero tra i vari riferimenti di tali segmenti).

3.4.4 Stima della posizione del centro d'anca (FH)

Una nota particolare va fatta per un punto anatomico necessario alla costruzione dei vari sistemi (terne) di riferimento: la testa del femore (FH). Non essendo questo un punto ricavabile semplicemente, ovvero non determinabile mediante la palpazione (al contrario degli altri punti toccati dalla punta dello *stick*) si è cercato di trovare una soluzione facilmente applicabile in ogni condizione di acquisizione.

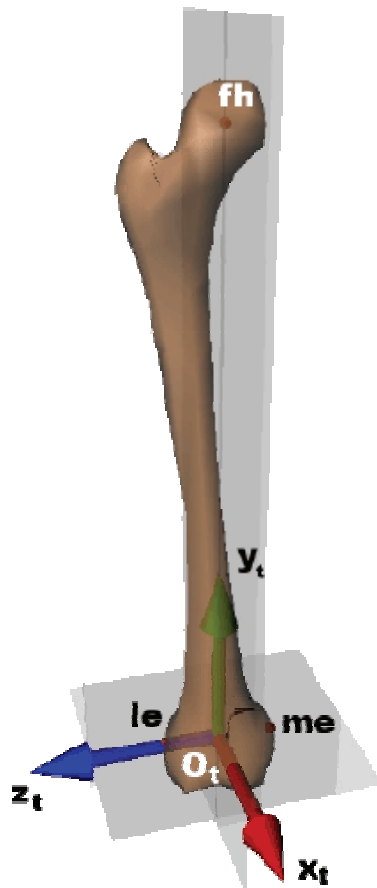


Fig 3.10 Sistema di riferimento anatomico relativo al Femore, di noti il punto FH.

Si è pertanto utilizzata a tal fine la stima della posizione del centro d'anca mediante formule di regressione applicate a dati antropometrici di popolazione [13] in maniera simile a quanto avviene nel protocollo Davis [1]; tramite i punti di repere situati nel bacino e facilmente identificabili mediante la palpazione ed i dati antropometrici suggeriti dalle tabelle presenti in letteratura, si ricavano con ottima approssimazione la posizione della testa del femore,. A lavoro quasi ultimato e dopo aver ben definito l'ordine delle operazioni da fare per intraprendere l'analisi del cammino di un paziente mediante il protocollo CAST [2], si sono effettuate nuove acquisizioni su altri due soggetti, per poter confrontare i risultati ottenuti e per poter considerare vantaggi e svantaggi di tale metodo per l'analisi del movimento.

I dati ed i risultati sono stati poi confrontati con quelli precedentemente ricavati mediante l'impiego del Davis [1], risultando effettivamente validi ed attendibili.

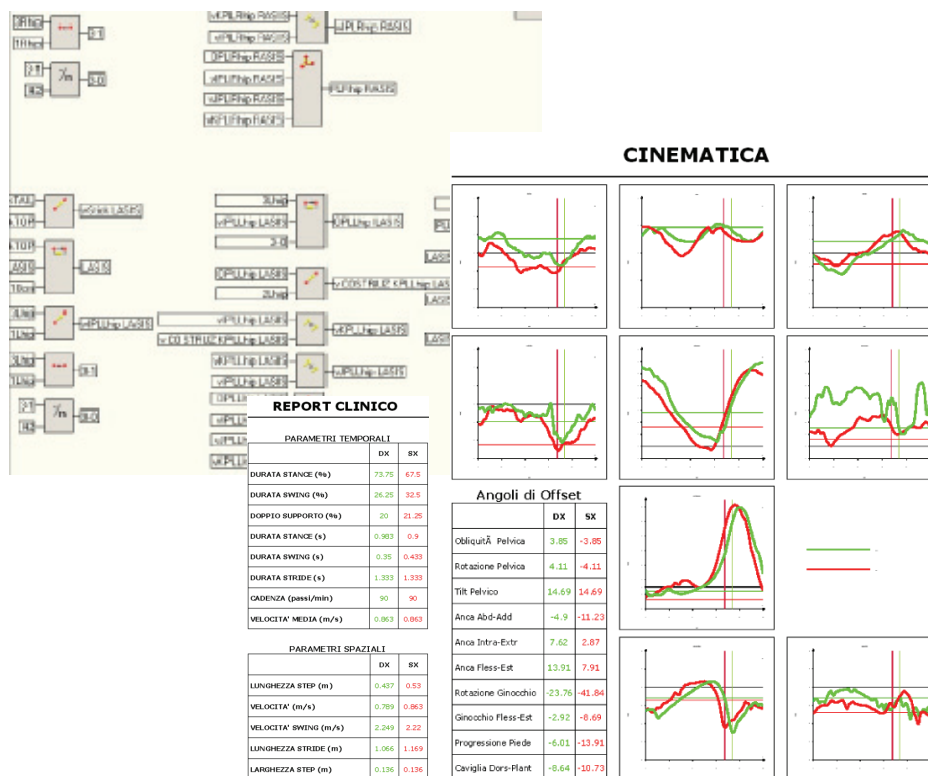


Fig 3.11 Parte del codice del protocollo CAST [2] implementato con SMART Analyzer ed i report che il programma restituisce.

4 CONCLUSIONI

Durante il tirocinio in BTS è stato possibile, per prima cosa, conoscere e capire come i vari reparti dell'azienda collaborino per la buona riuscita finale del prodotto e la sua immissione nel mercato, in particolare, nell'area Ricerca e Sviluppo.

Lo sviluppo del CAST [2], inteso come produzione dei prototipi del materiale necessario alle acquisizioni e alla calibrazione anatomica (*stick* e placche) e della parte software che gestisce i dati delle acquisizioni stesse e ne restituisce il report clinico finale, ha messo in evidenza alcuni aspetti importanti: esso, come già detto in precedenza, ha come principale vantaggio la completa assenza di singoli *marker* sui punti di repere e dunque minimizza il problema degli artefatti dovuti allo scorrimento della pelle e permette acquisizioni dinamiche più libere nei movimenti. Non vanno però dimenticati alcuni svantaggi come il gran numero di operazioni che devono essere generate per ricostruire le coordinate dei punti di repere anatomico calibrati mediante lo *stick* in relazione alle placche.

Avendo standardizzato e modulato il più possibile la parte di codice scritta (anche agendo direttamente mediante un *editor* di codice *.xml* e non solamente nell'ambiente di sviluppo *drag&drop* di Smart Analyzer) per ricavare i punti di repere e riapplicandola per ognuno di essi, la prima parte delle operazioni si presenta come un blocco formato da un piccolo gruppo di operatori (circa quindici) ripetuti quasi identicamente cinquantadue volte (i punti di repere sono tredici per parte, e bisogna ripetere le stesse operazioni per l'acquisizioni statica e per quella dinamica).

In una versione successiva andrebbero di sicuro applicate a tale prodotto alcune migliorie; andrebbero apportate in particolare tre principali modifiche:

- 1) ottimizzare la parte di ricostruzione dei sistemi di riferimento.

2) Semplificare la “laboriosa” apertura del programma: per avviare il CAST [2] infatti dobbiamo selezionare ed aprire almeno ventotto sequenze diverse, una ad una (punti di reperi lato destro, lato sinistro, almeno un’acquisizione statica e almeno una dinamica); l’ideale sarebbe eseguire un’unica acquisizione per la calibrazione anatomica e riconoscere e dividere poi i vari eventi corrispondenti al tocco della punta dello *stick* del punto interessato; questa procedura comunque non è facilmente applicabile in quanto si dovrebbe ricostruire un *file* di lunga durata temporale nel quale scompaiono e riappaiono troppo spesso i *marker* (occlusioni) che devono essere successivamente riconosciuti con un processo molto lungo e laborioso.

3) costruire nuove placche da posizionare sui piedi: nel cammino, al momento dell’appoggio del piede a terra, si producono troppe vibrazioni e tale rumore, per quanto poi filtrato e ridotto, altera i dati ricavati dalle acquisizioni dinamiche.

APPENDICE A: Codice sviluppato (versione .XML)

Per motivi di spazio e soprattutto per i diritti di privacy dell'azienda BTS su tutto il materiale prodotto entro la sua sede nel periodo di tirocinio, riporto qui solo una parte del codice sviluppato per l'implementazione del protocollo CAST [2].

Codice:

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  <vector sequence="dinamiche" label="vXPELVIS"/>
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  <scalar_value sequence="_userInput" label="#2"/>
</trackId>
<track label="OPLLhip" algo="vectors" x="29610" y="10935" description="" visible="true">
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  <vector sequence="static" label="vIPLLhip"/>
  <trackId sequence="static" label="3-OLASIS"/>
</track>
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  <track sequence="static" label="2Lhip"/>
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<vector label="vKPLLhip" algo="cross" x="33225" y="11010" description="" visible="true">
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  <vector sequence="static" label="v COSTRUZ KPLLhip"/>
</vector>
<vector label="vJPLLhip" algo="cross" x="33225" y="11640" description="" visible="true">
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  <vector sequence="static" label="vIPLLhip"/>
</vector>
<reference label="PLLhip" algo="vectors" x="33225" y="12285" description="" visible="true">
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  <vector sequence="static" label="vIPLLhip"/>
  <vector sequence="static" label="vJPLLhip"/>
  <vector sequence="static" label="vKPLLhip"/>
</reference>
<track label="LASIS" algo="reference" x="37875" y="10170" description="" visible="true">
  <reference sequence="static" label="PLLhip"/>
  <trackId_value_band sequence="asis-l" label="mLASISX"/>
  <trackId_value_band sequence="asis-l" label="mLASISY"/>
  <trackId_value_band sequence="asis-l" label="mLASISZ"/>
</track>
<track label="RPSIS" algo="reference" x="37875" y="16935" description="" visible="true">
  <reference sequence="static" label="PLRhip"/>
  <trackId_value_band sequence="psis-r" label="mRPSISX"/>
  <trackId_value_band sequence="psis-r" label="mRPSISY"/>
  <trackId_value_band sequence="psis-r" label="mRPSISZ"/>
</track>
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<reference sequence="static" label="PLLhip"/>
<track1d_value_band sequence="psis-l" label="mLPSISX"/>
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<track1d_value_band sequence="psis-l" label="mLPSISZ"/>
</track>
<vector label="vIPLRfemur" algo="tracks" x="29370" y="26670" description="" visible="true">
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  <track sequence="static" label="1Rfemur"/>
</vector>
<track1d label="3-1RGT" algo="tracks" x="29370" y="28680" description="" visible="true">
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  <track sequence="static" label="1Rfemur"/>
</track1d>
<track1d label="3-ORGT" algo="scalar_inv" x="29370" y="29505" description="" visible="true">
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  <scalar_value sequence="_userInput" label="#2"/>
</track1d>
<track label="OPLRfemur" algo="vectors" x="29370" y="27495" description="" visible="true">
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  <vector sequence="static" label="vIPLRfemur"/>
  <track1d sequence="static" label="3-ORGT"/>
</track>
<vector label="v_costr_KPLRfemur" algo="tracks" x="33375" y="26775" description="" visible="true">
  <track sequence="static" label="OPLRfemur"/>
  <track sequence="static" label="2Rfemur"/>
</vector>
<vector label="vKPLRfemur" algo="cross" x="33375" y="27472" description="" visible="true">
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  <vector sequence="static" label="v_costr_KPLRfemur"/>
</vector>
<vector label="vJPLRfemur" algo="cross" x="33420" y="28155" description="" visible="true">
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  <vector sequence="static" label="vIPLRfemur"/>
</vector>
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  <vector sequence="static" label="vIPLRfemur"/>
  <vector sequence="static" label="vJPLRfemur"/>
  <vector sequence="static" label="vKPLRfemur"/>
</reference>
<track label="RGT" algo="reference" x="37620" y="26760" description="" visible="true">
  <reference sequence="static" label="PLRfemur"/>
  <track1d_value_band sequence="gt-r" label="mRGTX"/>
  <track1d_value_band sequence="gt-r" label="mRGTY"/>
  <track1d_value_band sequence="gt-r" label="mRGTZ"/>
</track>
<vector label="vPLLfemur" algo="tracks" x="29460" y="31980" description="" visible="true">
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  <track sequence="static" label="1Lfemur"/>
</vector>
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  <track sequence="static" label="1Lfemur"/>
</track1d>
<track1d label="3-OLGT" algo="scalar_inv" x="29460" y="34890" description="" visible="true">
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  <scalar_value sequence="_userInput" label="#2"/>
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<track label="OPLLfemur" algo="vectors" x="29460" y="32830" description="" visible="true">
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  <vector sequence="static" label="vIPLLfemur"/>
  <track1d sequence="static" label="3-OLGT"/>
</track>
<vector label="v_COSTRUZ_KPLLfemur" algo="tracks" x="33435" y="32070" description="" visible="true">
  <track sequence="static" label="OPLLfemur"/>
  <track sequence="static" label="2Lfemur"/>
</vector>
<vector label="vKPLLfemur" algo="cross" x="33420" y="32798" description="" visible="true">
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  <vector sequence="static" label="v_COSTRUZ_KPLLfemur"/>
</vector>
<vector label="vJPLLfemur" algo="cross" x="33465" y="33480" description="" visible="true">
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  <vector sequence="static" label="vIPLLfemur"/>
</vector>
<reference label="PLLfemur" algo="vectors" x="33450" y="34140" description="" visible="true">
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  <vector sequence="static" label="vIPLLfemur"/>
  <vector sequence="static" label="vJPLLfemur"/>
  <vector sequence="static" label="vKPLLfemur"/>
</reference>
<track label="LGT" algo="reference" x="37575" y="32040" description="" visible="true">
  <reference sequence="static" label="PLLfemur"/>
  <track1d_value_band sequence="gt-l" label="mLGTX"/>
  <track1d_value_band sequence="gt-l" label="mLGTY"/>
  <track1d_value_band sequence="gt-l" label="mLGTZ"/>
</track>
<track label="RLE" algo="reference" x="37710" y="37260" description="" visible="true">
  <reference sequence="static" label="PLRfemur"/>
  <track1d_value_band sequence="le-r" label="mRLEX"/>
  <track1d_value_band sequence="le-r" label="mRLEY"/>
  <track1d_value_band sequence="le-r" label="mRLEZ"/>
</track>
<track label="LLE" algo="reference" x="37710" y="42615" description="" visible="true">
  <reference sequence="static" label="PLLfemur"/>
  <track1d_value_band sequence="le-l" label="mLLEX"/>

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        <track1d_value_band sequence="le-l" label="mLLEY"/>
        <track1d_value_band sequence="le-l" label="mLLEZ"/>
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        <track1d_value_band sequence="me-r" label="mRMEX"/>
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        <track1d_value_band sequence="me-r" label="mRMEZ"/>
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    <track label="LME" algo="reference" x="37740" y="54960" description="" visible="true">
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        <track1d_value_band sequence="me-l" label="mLMEX"/>
        <track1d_value_band sequence="me-l" label="mLMEY"/>
        <track1d_value_band sequence="me-l" label="mLMEZ"/>
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    <vector label="vIPLRtibia" algo="tracks" x="29400" y="59580" description="" visible="true">
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        <track sequence="static" label="1Rtibia"/>
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    </track1d>
    <track1d label="3-ORTT" algo="scalar_inv" x="29400" y="62490" description="" visible="true">
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        <scalar_value sequence="_userInput" label="#2"/>
    </track1d>
    <track label="OPLRtibia" algo="versor" x="29400" y="60430" description="" visible="true">
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        <vector sequence="static" label="vIPLRtibia"/>
        <track1d sequence="static" label="3-ORTT"/>
    </track>
    <vector label="v COSTRUZ KPLRtibia" algo="tracks" x="32640" y="59640" description="" visible="true">
        <track sequence="static" label="OPLRtibia"/>
        <track sequence="static" label="2Rtibia"/>
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        <vector sequence="static" label="v COSTRUZ KPLRtibia"/>
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    <vector label="vJPLRtibia" algo="cross" x="32670" y="61365" description="" visible="true">
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        <vector sequence="static" label="vIPLRtibia"/>
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    <reference label="PLRtibia" algo="versors" x="32700" y="62175" description="" visible="true">
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        <vector sequence="static" label="vIPLRtibia"/>
        <vector sequence="static" label="vJPLRtibia"/>
        <vector sequence="static" label="vKPLRtibia"/>
    </reference>
    <track label="RTT" algo="reference" x="37785" y="59535" description="" visible="true">
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        <track1d_value_band sequence="tt-r" label="mRTTX"/>
        <track1d_value_band sequence="tt-r" label="mRTTY"/>
        <track1d_value_band sequence="tt-r" label="mRTTZ"/>
    </track>
    <vector label="vIPLLtibia" algo="tracks" x="29490" y="64785" description="" visible="true">
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        <track sequence="static" label="1Ltibia"/>
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        <track sequence="static" label="1Ltibia"/>
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    <track1d label="3-OLTT" algo="scalar_inv" x="29490" y="67620" description="" visible="true">
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        <scalar_value sequence="_userInput" label="#2"/>
    </track1d>
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        <vector sequence="static" label="vIPLLtibia"/>
        <track1d sequence="static" label="3-OLTT"/>
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    <vector label="v COSTRUZ KPLLtibia" algo="tracks" x="32790" y="64860" description="" visible="true">
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        <track sequence="static" label="2Ltibia"/>
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    <vector label="vKPLLtibia" algo="cross" x="32790" y="65753" description="" visible="true">
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        <vector sequence="static" label="v COSTRUZ KPLLtibia"/>
    </vector>
    <vector label="vJPLLtibia" algo="cross" x="32745" y="66675" description="" visible="true">
        <vector sequence="static" label="vKPLLtibia"/>
        <vector sequence="static" label="vIPLLtibia"/>
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    <reference label="PLLtibia" algo="versors" x="32745" y="67500" description="" visible="true">
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        <vector sequence="static" label="vIPLLtibia"/>
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    </reference>
    <track label="LTT" algo="reference" x="37770" y="64920" description="" visible="true">
        <reference sequence="static" label="PLLtibia"/>
        <track1d_value_band sequence="tt-l" label="mLTTX"/>
        <track1d_value_band sequence="tt-l" label="mLTTY"/>
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</track>
<track label="RHF" algo="reference" x="37905" y="70080" description="" visible="true">
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  <track1d_value_band sequence="hf-r" label="mRHFY"/>
  <track1d_value_band sequence="hf-f" label="mRHFZ"/>
</track>
<track label="LHF" algo="reference" x="37905" y="75870" description="" visible="true">
  <reference sequence="static" label="PLLtibia"/>
  <track1d_value_band sequence="hf-l" label="mLHFX"/>
  <track1d_value_band sequence="hf-r" label="mLHFY"/>
  <track1d_value_band sequence="hf-f" label="mLHFZ"/>
</track>
<track label="RLM" algo="reference" x="37905" y="81090" description="" visible="true">
  <reference sequence="static" label="PLRtibia"/>
  <track1d_value_band sequence="lm-r" label="mRLMX"/>
  <track1d_value_band sequence="lm-r" label="mRLMY"/>
  <track1d_value_band sequence="lm-r" label="mRLMZ"/>
</track>
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  <track1d_value_band sequence="lm-l" label="mLLMX"/>
  <track1d_value_band sequence="lm-l" label="mLLMY"/>
  <track1d_value_band sequence="lm-l" label="mLLMZ"/>
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  <track1d_value_band sequence="mm-r" label="mRMMX"/>
  <track1d_value_band sequence="mm-r" label="mRMMY"/>
  <track1d_value_band sequence="mm-r" label="mRMMZ"/>
</track>
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  <track1d_value_band sequence="mm-l" label="mLMMX"/>
  <track1d_value_band sequence="mm-l" label="mLMMY"/>
  <track1d_value_band sequence="mm-l" label="mLMMZ"/>
</track>
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  <track sequence="static" label="1Rfoot"/>
</vector>
<track1d label="3-IRCA" algo="tracks" x="29805" y="106865" description="" visible="true">
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  <track sequence="static" label="1Rfoot"/>
</track1d>
<track1d label="3-ORCA" algo="scalar_inv" x="29805" y="107775" description="" visible="true">
  <track1d sequence="static" label="3-1RCA"/>
  <scalar_value sequence="_userInput" label="#2"/>
</track1d>
<track label="OPLRfoot" algo="versor" x="29805" y="105595" description="" visible="true">
  <track sequence="static" label="3Rfoot"/>
  <vector sequence="static" label="vIPLRfoot"/>
  <track1d sequence="static" label="3-ORCA"/>
</track>
<vector label="v COSTRUZ KPLRfoot" algo="tracks" x="33120" y="104805" description="" visible="true">
  <track sequence="static" label="OPLRfoot"/>
  <track sequence="static" label="2Rfoot"/>
</vector>
<vector label="vKPLRfoot" algo="cross" x="33120" y="105485" description="" visible="true">
  <vector sequence="static" label="vIPLRfoot"/>
  <vector sequence="static" label="v COSTRUZ KPLRfoot"/>
</vector>
<vector label="vJPLRfoot" algo="cross" x="33120" y="106165" description="" visible="true">
  <vector sequence="static" label="vKPLRfoot"/>
  <vector sequence="static" label="vIPLRfoot"/>
</vector>
<reference label="PLRfoot" algo="versors" x="33120" y="106845" description="" visible="true">
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  <vector sequence="static" label="vIPLRfoot"/>
  <vector sequence="static" label="vJPLRfoot"/>
  <vector sequence="static" label="vKPLRfoot"/>
</reference>
<track label="RCA" algo="reference" x="37440" y="104790" description="" visible="true">
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  <track1d_value_band sequence="ca-r" label="mRCAX"/>
  <track1d_value_band sequence="ca-r" label="mRCAY"/>
  <track1d_value_band sequence="ca-r" label="mRCAZ"/>
</track>
<vector label="vIPLLfoot" algo="tracks" x="29940" y="110385" description="" visible="true">
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  <track sequence="static" label="1Lfoot"/>
</vector>
<track1d label="3-ILCA" algo="tracks" x="29940" y="112745" description="" visible="true">
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  <track sequence="static" label="1Lfoot"/>
</track1d>
<track1d label="3-OLCA" algo="scalar_inv" x="29940" y="113745" description="" visible="true">
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  <scalar_value sequence="_userInput" label="#2"/>
</track1d>
<track label="OPLLfoot" algo="versor" x="29940" y="111385" description="" visible="true">
  <track sequence="static" label="3Lfoot"/>
  <vector sequence="static" label="vIPLLfoot"/>
  <track1d sequence="static" label="3-OLCA"/>
</track>
<vector label="v COSTRUZ KPLLfoot" algo="tracks" x="33160" y="110460" description="" visible="true">

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        <vector sequence="static" label="vIPLLfoot"/>
    </vector>
    <reference label="PLLfoot" algo="versors" x="33160" y="112740" description="" visible="true">
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    </reference>
    <track label="LCA" algo="reference" x="37440" y="110565" description="" visible="true">
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        <track1d_value_band sequence="ca-l" label="mLCAX"/>
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        <track1d_value_band sequence="ca-l" label="mLCAZ"/>
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    <track label="RFM" algo="reference" x="37530" y="115665" description="" visible="true">
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        <track1d_value_band sequence="fm-r" label="mRFMX"/>
        <track1d_value_band sequence="fm-r" label="mRFMY"/>
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    <track label="LFM" algo="reference" x="37530" y="121635" description="" visible="true">
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        <track1d_value_band sequence="fm-l" label="mLFMX"/>
        <track1d_value_band sequence="fm-l" label="mLFMY"/>
        <track1d_value_band sequence="fm-l" label="mLFMZ"/>
    </track>
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        <track1d_value_band sequence="sm-r" label="mRSMX"/>
        <track1d_value_band sequence="sm-r" label="mRSMY"/>
        <track1d_value_band sequence="sm-r" label="mRSMZ"/>
    </track>
    <track label="LSM" algo="reference" x="37530" y="132847" description="" visible="true">
        <reference sequence="static" label="PLLfoot"/>
        <track1d_value_band sequence="sm-l" label="mLSMX"/>
        <track1d_value_band sequence="sm-l" label="mLSMY"/>
        <track1d_value_band sequence="sm-l" label="mLSMZ"/>
    </track>
    <track label="RVM" algo="reference" x="37530" y="139057" description="" visible="true">
        <reference sequence="static" label="PLRfoot"/>
        <track1d_value_band sequence="vm-r" label="mRVMX"/>
        <track1d_value_band sequence="vm-r" label="mRVMY"/>
        <track1d_value_band sequence="vm-r" label="mRVMZ"/>
    </track>
    <track label="LVM" algo="reference" x="37695" y="145380" description="" visible="true">
        <reference sequence="static" label="PLLfoot"/>
        <track1d_value_band sequence="vm-l" label="mLVMX"/>
        <track1d_value_band sequence="vm-l" label="mLVMY"/>
        <track1d_value_band sequence="vm-l" label="mLVMZ"/>
    </track>
    <vector label="vZPELVIS" algo="tracks" x="16245" y="163665" description="" visible="true">
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        <track sequence="static" label="RASIS"/>
    </vector>
    <track1d label="LASIS-RASIS" algo="tracks" x="16245" y="164605" description="" visible="true">
        <track sequence="static" label="LASIS"/>
        <track sequence="static" label="RASIS"/>
    </track1d>
    <track1d label="midASIS" algo="scalar_inv" x="16245" y="165505" description="" visible="true">
        <track1d sequence="static" label="LASIS-RASIS"/>
        <scalar_value sequence="_userInput" label="#2"/>
    </track1d>
    <track label="OPELVIS" algo="versor" x="16245" y="166395" description="" visible="true">
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        <vector sequence="static" label="vZPELVIS"/>
        <track1d sequence="static" label="midASIS"/>
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        <vector sequence="static" label="vLPSIS-RPSIS"/>
        <track1d sequence="static" label="midPSIS"/>
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        <track sequence="static" label="OPELVIS"/>
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</vector>
<vector label="vPELVIS" algo="cross" x="21630" y="164625" description="" visible="true">
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</track1d_value_band>
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</track_value>
<track_value label="RFH1" algo="vector3d" x="9660" y="158310" description="" visible="true">
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  <vector_value sequence="_userInput" label="vRHIP"/>
</track_value>
<track_value label="LFH1" algo="vector3d" x="9660" y="159510" description="" visible="true">
  <track_value sequence="static" label="ASIS BREATH"/>
  <vector_value sequence="_userInput" label="vLHIP"/>
</track_value>
<track label="RFH" algo="relative_inv" x="23320" y="158535" description="" visible="true">
  <track_value sequence="static" label="RFH1"/>
  <reference sequence="dinamiche" label="SACRUM"/>
</track>
<vector label="vYRTHIGH" algo="tracks" x="3565" y="176310" description="" visible="true">
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  <track sequence="dinamiche" label="RFH"/>
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<vector label="vXRTHIGH" algo="cross" x="3565" y="177790" description="" visible="true">
  <vector sequence="dinamiche" label="vYRTHIGH"/>
  <vector sequence="dinamiche" label="v COSTRUZ RX"/>
</vector>
<vector label="vZRTHIGH" algo="cross" x="3565" y="178530" description="" visible="true">
  <vector sequence="dinamiche" label="vXRTHIGH"/>

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      <vector sequence="dinamiche" label="vYRTHIGH"/>
</vector>
<reference label="RTHIGH1" algo="vectors" x="3565" y="179270" description="" visible="true">
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  <vector sequence="dinamiche" label="vXRTHIGH"/>
  <vector sequence="dinamiche" label="vYRTHIGH"/>
  <vector sequence="dinamiche" label="vZRTHIGH"/>
</reference>
<reference label="RTHIGH2" algo="90z" x="3565" y="180730" description="" visible="true">
  <reference sequence="dinamiche" label="RTHIGH1"/>
</reference>
<reference label="RTHIGH" algo="180x" x="3565" y="181470" description="" visible="true">
  <reference sequence="dinamiche" label="RTHIGH2"/>
</reference>
<angle3d label="jRHP1" algo="eulerZYX" x="3630" y="208185" description="" visible="true">
  <reference sequence="dinamiche" label="PELVIS"/>
  <reference sequence="dinamiche" label="RTHIGH"/>
</angle3d>
<angle3d label="jRHP" algo="vector3d" x="3630" y="208950" description="" visible="true">
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  <vector_value sequence="userInput" label="v11M1"/>
</angle3d>
<angle_value_band label="amRHPIE" algo="time_mean" x="6525" y="209955" description="" visible="true">
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</angle_value_band>
<angle_value_band label="amRHAAA" algo="time_mean" x="6525" y="209160" description="" visible="true">
  <angle sequence="dinamiche" label="jRHP.Y"/>
</angle_value_band>
<angle_value_band label="amRHPFE" algo="time_mean" x="6525" y="208290" description="" visible="true">
  <angle sequence="dinamiche" label="jRHP.Z"/>
</angle_value_band>
<angle3d label="jRK" algo="eulerZYX" x="3630" y="211035" description="" visible="true">
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  <reference sequence="dinamiche" label="RSHANK"/>
</angle3d>
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<angle_value_band label="amRKFE" algo="time_mean" x="6525" y="211095" description="" visible="true">
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</angle_value_band>
<angle_value_band label="amRKIE" algo="time_mean" x="6525" y="212760" description="" visible="true">
  <angle sequence="dinamiche" label="jRK.X"/>
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  <angle sequence="dinamiche" label="jRA.Z"/>
  <angle sequence="dinamiche" label="jRK.Z"/>
</event_mvalue>
<angle_mcycle label="acRKFE" algo="trigger" x="13665" y="211065" description="" visible="true">
  <angle sequence="dinamiche" label="jRK.Z"/>
  <event_mvalue sequence="dinamiche" label="eRHS"/>
</angle_mcycle>
<angle_mcycle label="acRCAA" algo="trigger" x="13665" y="211875" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</angle_mcycle>
<angle_mcycle label="acRKIE" algo="trigger" x="13665" y="212760" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</angle_mcycle>
<angle_cycle_band label="acmRKFE" algo="cseq_mean" x="16875" y="211095" description="" visible="true">
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</angle_cycle_band>
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<angle_mcycle label="acRPOBLI" algo="trigger" x="13680" y="234960" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</angle_mcycle>
<angle_mcycle label="acRPROT" algo="trigger" x="13680" y="235845" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</angle_mcycle>
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</angle_cycle_band>
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</track_mvalue>
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</vector_mvalue>
<vector_value_band label="vmSseqRHS" algo="seq_mean" x="3300" y="239055" description="" visible="true">
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  <angle sequence="dinamiche" label="jRA.Z"/>
  <angle sequence="dinamiche" label="jRK.Z"/>
</event_mvalue>
<event_mcycle label="enRTO" algo="trigger" x="10110" y="210405" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</event_mcycle>
<event_cycle_band label="enmRTO" algo="cseq_mean" x="10110" y="211493" description="" visible="true">
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</event_cycle_band>
<angle_mcycle label="acRHPIE" algo="trigger" x="13665" y="209895" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</angle_mcycle>
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</angle_cycle_band>
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
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<angle_mcycle label="acRHPFE" algo="trigger" x="13665" y="208200" description="" visible="true">
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</angle_mcycle>
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</angle_cycle_band>
<angle_mcycle label="acRAIE" algo="trigger" x="13665" y="215595" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</angle_mcycle>
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<angle_cycle_band label="acmRAFE" algo="cseq_mean" x="16875" y="213915" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</track_mvalue>
<trackId_mvalue label="dseqRSTEP" algo="value" x="10560" y="244650" description="" visible="true">
  <trackId sequence="dinamiche" label="dRSTEP"/>
  <event_mvalue sequence="dinamiche" label="eRHS"/>
</trackId_mvalue>
<trackId_value_band label="dmRSTEP" algo="seq_mean" x="13290" y="244575" description="" visible="true">
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</trackId_value_band>
<time_mvalue label="tseqRSTRIDE" algo="trigger" x="21915" y="239565" description="" visible="true">
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</time_mvalue>
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  <event_mvalue sequence="dinamiche" label="eRTO"/>
</time_mvalue>
<time_mvalue label="tseqRSWING" algo="dbl_trigger" x="21915" y="241065" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRHS"/>
</time_mvalue>
<time_value_band label="tmRSTRIDE" algo="seq_mean" x="24960" y="239700" description="" visible="true">
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</time_value_band>
<time_value_band label="tmRSTANCE" algo="seq_mean" x="24960" y="240385" description="" visible="true">
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<time_value_band label="tmRSWING" algo="seq_mean" x="24960" y="241070" description="" visible="true">
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</time_value_band>
<scalar_value label="sRSTANCE" algo="ratio" x="31725" y="239760" description="" visible="true">
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  <time_value_band sequence="dinamiche" label="tmRSTRIDE"/>
</scalar_value>
<scalar_value label="sRSWING" algo="ratio" x="31725" y="240633" description="" visible="true">
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</scalar_value>

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<freq_value label="fqRCADENCE" algo="inverse" x="37545" y="240525" description="" visible="true">
  <time_value_band sequence="dinamiche" label="tmRSTRIDE"/>
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  <vel_sequence="dinamiche" label="vel3DRCA"/>
  <event_mvalue sequence="dinamiche" label="eRHS"/>
</vel_mvalue_band>
<vel_mvalue_band label="vel3DRHSWING" algo="dbl_trigger_mean" x="43035" y="240840" description="" visible="true">
  <vel_sequence="dinamiche" label="vel3DRCA"/>
  <event_mvalue sequence="dinamiche" label="eRTO"/>
  <event_mvalue sequence="dinamiche" label="eRHS"/>
</vel_mvalue_band>
<vel_value_band label="vel3DmRSTRIDE" algo="seq_mean" x="46320" y="239880" description="" visible="true">
  <vel_mvalue_band sequence="dinamiche" label="vel3DRHSTRIDE"/>
</vel_value_band>
<vel_value_band label="vel3DmRHSWING" algo="seq_mean" x="46350" y="240915" description="" visible="true">
  <vel_mvalue_band sequence="dinamiche" label="vel3DRHSWING"/>
</vel_value_band>
<vel1d_value label="velRHSTRIDE" algo="norm" x="49980" y="239850" description="" visible="true">
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</vel1d_value>
<vel1d_value label="velRHSWING" algo="norm" x="50010" y="240795" description="" visible="true">
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</vel1d_value>
<track1d_mvalue label="dseqRSTRIDE" algo="diff" x="12315" y="240360" description="" visible="true">
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</track1d_mvalue>
<track1d_value_band label="dmRSTRIDE" algo="seq_mean" x="15060" y="240300" description="" visible="true">
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</track1d_value_band>
<event_cycle_band label="eRTO" algo="macq_mean" x="10110" y="212580" description="" visible="true">
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</event_cycle_band>
<angle_cycle_band label="aRHPFE" algo="macq_mean" x="19740" y="208110" description="" visible="true">
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</angle_cycle_band>
<angle_cycle_band label="aRHPAA" algo="macq_mean" x="19740" y="208980" description="" visible="true">
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</angle_cycle_band>
<angle_cycle_band label="aRKFE" algo="macq_mean" x="19740" y="210990" description="" visible="true">
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<angle_cycle_band label="aRCAA" algo="macq_mean" x="19740" y="211860" description="" visible="true">
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<track1d_value_band label="dRSTEP" algo="macq_mean" x="16680" y="244650" description="" visible="true">
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</scalar_value_band>
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</vel1d_value_band>
<vel1d_value_band label="velRHSWING" algo="macq_mean" x="53040" y="240780" description="" visible="true">
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<track label="LFH" algo="relative_inv" x="23320" y="159510" description="" visible="true">
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  <reference sequence="dinamiche" label="SACRUM"/>
</track>
<vector label="vYLTHIGH" algo="tracks" x="8035" y="176100" description="" visible="true">
  <track sequence="dinamiche" label="OLTHIGH"/>
  <track sequence="dinamiche" label="LFH"/>
</vector>
<vector label="vXLTHIGH" algo="cross" x="8035" y="177565" description="" visible="true">
  <vector sequence="dinamiche" label="v COSTRUZ LX"/>
  <vector sequence="dinamiche" label="vYLTHIGH"/>
</vector>
<vector label="vZLTHIGH" algo="cross" x="8035" y="178298" description="" visible="true">
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  <vector sequence="dinamiche" label="vYLTHIGH"/>
</vector>
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  <vector sequence="dinamiche" label="vXLTHIGH"/>
  <vector sequence="dinamiche" label="vYLTHIGH"/>
  <vector sequence="dinamiche" label="vZLTHIGH"/>
</reference>
<reference label="LTHIGH2" algo="90z" x="8035" y="180482" description="" visible="true">
  <reference sequence="dinamiche" label="LTHIGH1"/>
</reference>
<reference label="LTHIGH" algo="180x" x="8035" y="181215" description="" visible="true">
  <reference sequence="dinamiche" label="LTHIGH2"/>
</reference>
<angle3d label="jLHP1" algo="eulerZYX" x="3630" y="217290" description="" visible="true">
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  <reference sequence="dinamiche" label="LTHIGH"/>
</angle3d>
<angle3d label="jLK2" algo="eulerZYX" x="3630" y="220080" description="" visible="true">
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  <reference sequence="dinamiche" label="LSHANK"/>
</angle3d>
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  <vector_value sequence="userInput" label="M1M11"/>
</angle3d>
<angle_value_band label="amLKIE" algo="time_mean" x="6525" y="221775" description="" visible="true">
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</angle_value_band>
<angle_value_band label="amLKAA" algo="time_mean" x="6525" y="220980" description="" visible="true">
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</angle_value_band>
<angle_value_band label="amLKFE" algo="time_mean" x="6525" y="220110" description="" visible="true">
  <angle sequence="dinamiche" label="jLK.Z"/>
</angle_value_band>
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  <vector_value sequence="userInput" label="vM1M1M1"/>
</angle3d>
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</angle_value_band>
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</angle_value_band>
<event_mvalue label="eLHS" algo="manual2" x="10215" y="217395" description="" visible="true" par1="0" par2="0" par3="0" ev1="" ev2="">
  <angle sequence="dinamiche" label="jLA.Z"/>
  <angle sequence="dinamiche" label="jLK.Z"/>
</event_mvalue>
<angle_mcycle label="acLPILT" algo="trigger" x="13650" y="231120" description="" visible="true">
  <angle sequence="dinamiche" label="jLP.Z"/>
  <event_mvalue sequence="dinamiche" label="eLHS"/>
</angle_mcycle>
<angle_mcycle label="acLPOBLI" algo="trigger" x="13650" y="231930" description="" visible="true">
  <angle sequence="dinamiche" label="jLP.Y"/>
  <event_mvalue sequence="dinamiche" label="eLHS"/>
</angle_mcycle>
<angle_mcycle label="acLPROT" algo="trigger" x="13650" y="232815" description="" visible="true">
  <angle sequence="dinamiche" label="jLP.X"/>
  <event_mvalue sequence="dinamiche" label="eLHS"/>
</angle_mcycle>
<angle_cycle_band label="acmLPILT" algo="cseq_mean" x="16860" y="231105" description="" visible="true">
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</angle_cycle_band>
<angle_cycle_band label="acmLPOBLI" algo="cseq_mean" x="16860" y="231930" description="" visible="true">
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</angle_cycle_band>
<angle_cycle_band label="acmLPROT" algo="cseq_mean" x="16860" y="232755" description="" visible="true">
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</angle_cycle_band>
<track_mvalue label="SseqLHS" algo="value" x="3240" y="240150" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
</track_mvalue>
<vector_mvalue label="vSseqLHS" algo="diff" x="3255" y="241005" description="" visible="true">
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</vector_mvalue>
<vector_value_band label="vmSseqLHS" algo="seq_mean" x="3255" y="241890" description="" visible="true">
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  <angle_sequence="dinamiche" label="jLK.Z"/>
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<event_mcycle label="enLTO" algo="trigger" x="10215" y="219717" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
</event_mcycle>
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  <event_mcycle sequence="dinamiche" label="enLTO"/>
</event_cycle_band>
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
</angle_mcycle>
<angle_cycle_band label="acmLHPiE" algo="cseq_mean" x="16875" y="218850" description="" visible="true">
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</angle_cycle_band>
<angle_mcycle label="acLHPAA" algo="trigger" x="13695" y="218025" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
</angle_mcycle>
<angle_cycle_band label="acmLHPAA" algo="cseq_mean" x="16875" y="218025" description="" visible="true">
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</angle_cycle_band>
<angle_mcycle label="acLHPFE" algo="trigger" x="13695" y="217215" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
</angle_mcycle>
<angle_cycle_band label="acmLHPFE" algo="cseq_mean" x="16875" y="217200" description="" visible="true">
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</angle_cycle_band>
<angle_mcycle label="acLKIE" algo="trigger" x="13695" y="221775" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
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<angle_cycle_band label="acmLKIE" algo="cseq_mean" x="16875" y="221835" description="" visible="true">
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</angle_cycle_band>
<angle_mcycle label="acLKAa" algo="trigger" x="13695" y="220890" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
</track_mvalue>
<trackId_mvalue label="dseqLSTEP" algo="value" x="10560" y="243915" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
</trackId_mvalue>
<trackId_value_band label="dmLSTEP" algo="seq_mean" x="13290" y="243900" description="" visible="true">
  <trackId_mvalue sequence="dinamiche" label="dseqLSTEP"/>
</trackId_value_band>
<time_mvalue label="tseqLSTRIDE" algo="trigger" x="21840" y="242730" description="" visible="true">
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</time_mvalue>
<time_mvalue label="tseqLSTANCE" algo="dbl_trigger" x="21840" y="243480" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLTO"/>
</time_mvalue>
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  <event_mvalue sequence="dinamiche" label="eLTO"/>
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<time_value_band label="tmLSTANCE" algo="seq_mean" x="25005" y="243460" description="" visible="true">
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</time_value_band>
<time_value_band label="tmLSWING" algo="seq_mean" x="25005" y="244145" description="" visible="true">
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</time_value_band>
<scalar_value label="sLSTANCE" algo="ratio" x="31740" y="242850" description="" visible="true">
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  <time_value_band sequence="dinamiche" label="tmLSTRIDE"/>
</scalar_value>
<scalar_value label="sLSWING" algo="ratio" x="31740" y="243723" description="" visible="true">
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  <time_value_band sequence="dinamiche" label="tmLSTRIDE"/>
</scalar_value>
<freq_value label="fqLCADENCE" algo="inverse" x="37545" y="241350" description="" visible="true">
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</freq_value>
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  <event_mvalue sequence="dinamiche" label="eLHS"/>
</vel_mvalue_band>
<vel_mvalue_band label="vel3DLHSWING" algo="dbl_trigger_mean" x="43035" y="243120" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eLTO"/>
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</vel_value_band>
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  <vel_mvalue_band sequence="dinamiche" label="vel3DLHSWING"/>
</vel_value_band>
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</vell_d_value>
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</vell_d_value>
<track1_d_mvalue label="dseqLSTRIDE" algo="diff" x="12315" y="239700" description="" visible="true">
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</track1_d_mvalue>
<track1_d_value_band label="dmLSTRIDE" algo="seq_mean" x="15060" y="239625" description="" visible="true">
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</track1_d_value_band>
<vector_value label="vmS" algo="sum" x="6570" y="239625" description="" visible="true">
  <vector_value_band sequence="dinamiche" label="vmSseqRHS"/>
  <vector_value_band sequence="dinamiche" label="vmSseqLHS"/>
</vector_value>
<time_mvalue label="tseqRDBLSTANCE" algo="dbl_trigger" x="21930" y="241830" description="" visible="true">
  <event_mvalue sequence="dinamiche" label="eRHS"/>
  <event_mvalue sequence="dinamiche" label="eLTO"/>
</time_mvalue>
<time_mvalue label="tseqLDBLSTANCE" algo="dbl_trigger" x="21855" y="244995" description="" visible="true">
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  <event_mvalue sequence="dinamiche" label="eRTO"/>
</time_mvalue>
<time_value_band label="tmRDBLSTANCE" algo="seq_mean" x="24960" y="241755" description="" visible="true">
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</time_value_band>
<scalar_value label="sRDBLSTANCE" algo="ratio" x="31725" y="241506" description="" visible="true">
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</scalar_value>
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</scalar_value>
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</event_cycle_band>
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<angle_cycle_band label="aLHPAA" algo="macq_mean" x="19740" y="217980" description="" visible="true">
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<angle_cycle_band label="aLKAA" algo="macq_mean" x="19740" y="221085" description="" visible="true">
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</track1d_value_band>
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  <time_value_band sequence="dinamiche" label="tmRDBLSTANCE"/>
</time_value_band>
<time_value_band label="lSTRIDE" algo="macq_mean" x="28410" y="242850" description="" visible="true">
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<time_value_band label="lSTANCE" algo="macq_mean" x="28410" y="243570" description="" visible="true">
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<time_value_band label="lDBLSTANCE" algo="macq_mean" x="28410" y="245010" description="" visible="true">
  <time_value_band sequence="dinamiche" label="tmLDBLSTANCE"/>
</time_value_band>
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<scalar_value_band label="sLSTANCE" algo="macq_mean" x="34635" y="242955" description="" visible="true">
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</freq_value_band>
<vel1d_value_band label="velLHSTRIDE" algo="macq_mean" x="53070" y="242355" description="" visible="true">
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</vel1d_value_band>
<track label="RFH" algo="relative_inv" x="23340" y="168495" description="" visible="true">
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  <reference sequence="static" label="SACRUM"/>
</track>
<vector label="vYRTHIGH" algo="tracks" x="19790" y="176040" description="" visible="true">
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  <track sequence="static" label="RFH"/>
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<vector label="vXRTHIGH" algo="cross" x="19790" y="177520" description="" visible="true">
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  <vector sequence="static" label="v COSTRUZ RX"/>
</vector>
<vector label="vZRTHIGH" algo="cross" x="19790" y="178260" description="" visible="true">
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</vector>
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  <vector sequence="static" label="vYRTHIGH"/>
  <vector sequence="static" label="vZRTHIGH"/>
</reference>
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</reference>
<reference label="RTHIGH" algo="180x" x="19790" y="181200" description="" visible="true">
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</reference>
<angle3d label="jRHP1" algo="eulerZYX" x="25515" y="208200" description="" visible="true">
  <reference sequence="static" label="PELVIS"/>
  <reference sequence="static" label="RTHIGH"/>
</angle3d>
<angle3d label="jRHP" algo="vector3d" x="25515" y="208965" description="" visible="true">

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        <angle3d sequence="static" label="jRHP1"/>
        <vector_value sequence="_userInput" label="v11M1"/>
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    </angle3d>
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        <angle sequence="static" label="jRHP.Z"/>
    </angle_value_band>
    <angle_value_band label="amRHAAA" algo="time_mean" x="28410" y="209175" description="" visible="true">
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    </angle_value_band>
    <angle_value_band label="amRHPIE" algo="time_mean" x="28410" y="209970" description="" visible="true">
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    </angle_value_band>
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    </angle_value_band>
    <angle_value_band label="amRCAA" algo="time_mean" x="28410" y="211980" description="" visible="true">
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    </angle_value_band>
    <angle_value_band label="amRKIE" algo="time_mean" x="28410" y="212775" description="" visible="true">
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    </angle_value_band>
    <track label="LFH" algo="relative_inv" x="23340" y="169470" description="" visible="true">
        <track_value sequence="static" label="LFH1"/>
        <reference sequence="static" label="SACRUM"/>
    </track>
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        <track sequence="static" label="LFH"/>
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    <vector label="vXLTHIGH" algo="cross" x="24165" y="177300" description="" visible="true">
        <vector sequence="static" label="v COSTRUZ LX"/>
        <vector sequence="static" label="vYLTHIGH"/>
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    <vector label="vZLTHIGH" algo="cross" x="24165" y="178040" description="" visible="true">
        <vector sequence="static" label="vXLTHIGH"/>
        <vector sequence="static" label="vYLTHIGH"/>
    </vector>
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        <track sequence="static" label="OLTHIGH"/>
        <vector sequence="static" label="vXLTHIGH"/>
        <vector sequence="static" label="vYLTHIGH"/>
        <vector sequence="static" label="vZLTHIGH"/>
    </reference>
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        <reference sequence="static" label="LTHIGH1"/>
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    <reference label="LTHIGH" algo="180x" x="24165" y="181185" description="" visible="true">
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    </reference>
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        <reference sequence="static" label="LTHIGH"/>
    </angle3d>
    <angle3d label="jLK2" algo="eulerZYX" x="25515" y="220095" description="" visible="true">
        <reference sequence="static" label="LTHIGH"/>
        <reference sequence="static" label="LSHANK"/>
    </angle3d>
    <angle3d label="jLK" algo="vector3d" x="25440" y="220920" description="" visible="true">
        <angle3d sequence="static" label="jLK2"/>
        <vector_value sequence="_userInput" label="M1M11"/>
    </angle3d>
    <angle3d label="jLHP" algo="vector3d" x="25545" y="218130" description="" visible="true">
        <angle3d sequence="static" label="jLHP1"/>
        <vector_value sequence="_userInput" label="vM1M1M1"/>
    </angle3d>
    <angle_value_band label="amLHPFE" algo="time_mean" x="28410" y="217320" description="" visible="true">
        <angle sequence="static" label="jLHP.Z"/>
    </angle_value_band>
    <angle_value_band label="amLHPAA" algo="time_mean" x="28410" y="218190" description="" visible="true">
        <angle sequence="static" label="jLHP.Y"/>
    </angle_value_band>
    <angle_value_band label="amLHPPIE" algo="time_mean" x="28410" y="218985" description="" visible="true">
        <angle sequence="static" label="jLHP.X"/>
    </angle_value_band>
    <angle_value_band label="amLKFE" algo="time_mean" x="28410" y="220125" description="" visible="true">
        <angle sequence="static" label="jLK.Z"/>
    </angle_value_band>
    <angle_value_band label="amLKAA" algo="time_mean" x="28410" y="220995" description="" visible="true">
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    </angle_value_band>
    <angle_value_band label="amLKIE" algo="time_mean" x="28410" y="221790" description="" visible="true">
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    </angle_value_band>
    </computations>
    <report>
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<g class="TableGrid21" visibility="visible" stroke="rgb(0,0,0)">
  <use xlink:href="#TableGridH21" y="593"/>
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  <use xlink:href="#TableGridV21" x="5"/>
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  <use xlink:href="#TableGridV21" x="10599"/>
</g>
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New Roman" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none"/>
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell21">PAZIENTE</text>
<text id="cell21_r_1_c_2" header="false" y="1027" x="3518" text-anchor="start" font-size="360" font-family="Times New
Roman" fill="rgb(0,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCell21">
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<text id="cell21_r_2_c_2" header="false" y="1630" x="3518" text-anchor="start" font-size="360" font-family="Times New
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<text id="cell21_r_3_c_2" header="false" y="2241" x="3571" text-anchor="start" font-size="360" font-family="Verdana"
fill="rgb(0,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCell21">CAST</text>
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family="Verdana" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none">REPORT CLINICO</text>
<text id="cell23_r_1_c_1" header="true" y="1507" x="84" text-anchor="start" font-size="360" font-family="Times New
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</g>
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family="Verdana" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none">PARAMETRI TEMPORALI</text>
<text id="cell24_r_1_c_1" header="true" y="1324" x="137" text-anchor="start" font-size="360" font-family="Verdana"
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<text id="cell24_r_1_c_2" header="false" y="1324" x="7419.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell24">DX</text>
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell24">SX</text>
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell24">DURATA STANCE (%)</text>
<text id="cell24_r_2_c_2" header="false" y="2503" x="7419.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink24">
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell24">DURATA SWING (%)</text>

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<text id="cell24_r_3_c_2" header="false" y="3682" x="7419.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink24"/>
</text>
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</text>
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<text id="cell24_r_4_c_2" header="false" y="4861" x="7419.5" text-anchor="middle" font-size="360" font-
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</text>
<text id="cell24_r_4_c_3" header="false" y="4861" x="9000" text-anchor="middle" font-size="360" font-family="Verdana"
fill="rgb(255,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink24"/>
</text>
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell24">DURATA STANCE (s)</text>
<text id="cell24_r_5_c_2" header="false" y="6039" x="7419.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink24"/>
</text>
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fill="rgb(255,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink24"/>
</text>
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<text id="cell24_r_6_c_2" header="false" y="7217" x="7419.5" text-anchor="middle" font-size="360" font-
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</text>
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</text>
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell24">DURATA STRIDE (s)</text>
<text id="cell24_r_7_c_2" header="false" y="8396" x="7419.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink24"/>
</text>
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell24">CADENZA (passi/min)</text>
<text id="cell24_r_8_c_2" header="false" y="9575" x="7419.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink24"/>
</text>
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</text>
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell24">VELOCITA' MEDIA (m/s)</text>
<text id="cell24_r_9_c_2" header="false" y="10753" x="7419.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink24"/>
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family="Verdana" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none">PARAMETRI SPAZIALI</text>
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<text id="cell25_r_1_c_3" header="false" y="1335" x="9014.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell25">SX</text>
<text id="cell25_r_2_c_1" header="true" y="2536" x="137" text-anchor="start" font-size="360" font-family="Verdana"
fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell25">LUNGHEZZA STEP (m)</text>
<text id="cell25_r_2_c_2" header="false" y="2536" x="7446.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink25">
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell25">VELOCITA' (m/s)</text>
<text id="cell25_r_3_c_2" header="false" y="3736" x="7446.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink25">
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fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell25">VELOCITA' SWING (m/s)</text>
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<text id="cell25_r_5_c_2" header="false" y="6137" x="7446.5" text-anchor="middle" font-size="360" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink25">
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</page>
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rendering="crispEdges" preserveAspectRatio="xMidYMid">
<title xmlns="http://www.w3.org/2000/svg">Page2</title>
<desc xmlns="http://www.w3.org/2000/svg">
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Table" x="2000" y="5600" width="17000"
height="1400" id="Table31_r1_c1">
<title>Table31</title>
<description>Table31</description>
<defs>
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<line id="TableGridV31" x1="0" x2="0" y2="100%" y1="1349"/>
</defs>
<rect class="TableBorder31" x="5" y="5" width="16990" height="1390" stroke="none" fill="rgb(255,255,255)"/>
<g class="TableGrid31" visibility="visible" stroke="rgb(0,0,0)">
<use xlink:href="#TableGridH31" y="1349"/>
<use xlink:href="#TableGridH31" y="1399"/>
<use xlink:href="#TableGridV31" x="5"/>
<use xlink:href="#TableGridV31" x="16999"/>
</g>
<text class="TableTitle31" visibility="visible" y="848" x="8500" text-anchor="middle" font-size="700" font-
family="Verdana" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none">CINEMATICA</text>
<text id="cell31_r_1_c_1" header="true" y="1507" x="84" text-anchor="start" font-size="360" font-family="Times New
Roman" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell31">
</text>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot19" x="7800" y="7200"
width="5400" height="5000">
<title>Plot19</title>
<description>Plot19</description>
<defs>
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text.PlottXTitle19 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlottYTitle19 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlottXValues19, text.PlottYValues19, text.PlottZeroVal19 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlottLegend19 { font-size: 280; font-family: Times New Roman; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
g.PlottLabels19 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
]]></style>
<line id="PlotGridH19" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" x1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotGridV19" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" y1="0" y2="-.89.8622981956315" stroke-width="1" stroke-dasharray="4,6"/>

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visibility="visible" stroke-width="237416908144951" stroke-dasharray="9.496676E-02,1424501" x1="0" x2="100"/>
visibility="hidden" stroke-width=".237416908144951" stroke-dasharray="9.496676E-02,1424501" y1="0" y2="89.8622981956315"/>
fill="rgb(255,255,255)" stroke-width="10"/>
fill="rgb(255,255,255)" stroke-width="10"/>
markerWidth="4" markerHeight="3" orient="auto">
<path d="M 0 0 L 6 3 L 0 6 z"/>
</marker>
</defs>
<rect class="PlotBorder19" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
<text class="PlotTitle19" text-anchor="middle" x="2700" y="346" visibility="visible">Tilt Pelvico</text>
<text class="PlotYTitle19" text-anchor="middle" transform="rotate(-90)" x="-2702" y="344" visibility="visible">Angolo
[deg]</text>
<text class="PlotXTTitle19" text-anchor="middle" x="2699" y="4942" visibility="visible">cielo [%]</text>
<g class="PlotLabels19" text-anchor="end" visibility="visible" transform="translate(5000,0)">
<text class="PlotLabelUp19" y="750">Ant</text>
<text class="PlotLabelDn19" y="4151">Retr</text>
</g>
<g class="PlotLegend19" visibility="hidden" transform="translate(5400,404)">
<rect class="PlotLegend19" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3454" height="4596"/>
</g>
<path class="PlotXAxis19" fill="none" marker-end="url(#PlotAxisArrow19)" stroke="rgb(0,0,0)" stroke-width="20" d="M
788 4269 H 5000"/>
<path class="PlotYAxis19" fill="none" marker-end="url(#PlotAxisArrow19)" stroke="rgb(0,0,0)" stroke-width="20" d="M
788 4269 V 484"/>
<g class="PlotXValues19" text-anchor="middle" visibility="visible" transform="translate(788,4561)"/>
<g class="PlotYValues19" text-anchor="end" visibility="visible" transform="translate(668,4269)"/>
<g class="PlotXTicks19" visibility="visible" transform="translate(788,4269)"/>
<g class="PlotYTicks19" visibility="visible" transform="translate(788,4269)"/>
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_xa_ym">
<g class="PlotGrid19" transform="translate(0,89.8623)">
<use xlink:href="#PlotZeroH19"/>
<use xlink:href="#PlotZeroV19"/>
<use xlink:href="#PlotGridH19" y="0"/>
<use xlink:href="#PlotGridH19" y="-5"/>
<use xlink:href="#PlotGridV19" x="0"/>
<use xlink:href="#PlotGridV19" x="20"/>
</g>
<g class="PlotData19" fill="none" stroke-linejoin="bevel" transform="translate(0,89.8623)">
<g class="PlotDataStd19" id="19_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#19_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
<use xlink:href="#19_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
</g>
<g class="PlotDataStd19" id="19_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#19_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
<use xlink:href="#19_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
</g>
<g class="PlotDataStd19" id="19_a_28_t_angle_value_1_amLPTILT.M" fill-opacity="0.3"
fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#19_a_28_t_angle_value_1_amLPTILT.M" fill="none"/>
<use xlink:href="#19_a_28_t_angle_value_1_amLPTILT.S" stroke="none"/>
</g>
<g class="PlotDataStd19" id="19_a_28_t_angle_value_1_amRPTILT.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#19_a_28_t_angle_value_1_amRPTILT.M" fill="none"/>
<use xlink:href="#19_a_28_t_angle_value_1_amRPTILT.S" stroke="none"/>
</g>
<g class="PlotDataStd19" id="19_a_0_t_angle_cycle_1_aRPTILT.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
<use xlink:href="#19_a_0_t_angle_cycle_1_aRPTILT.S" stroke="none"/>
<use xlink:href="#19_a_0_t_angle_cycle_1_aRPTILT.M" fill="none"/>
</g>
<g class="PlotDataStd19" id="19_a_0_t_angle_cycle_1_aLPTILT.MS" fill-opacity="0.3"
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">
<use xlink:href="#19_a_0_t_angle_cycle_1_aLPTILT.S" stroke="none"/>
<use xlink:href="#19_a_0_t_angle_cycle_1_aLPTILT.M" fill="none"/>
</g>
</g>
</g>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot23" x="13600" y="7200"
width="5400" height="5000">
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<description>Plot23</description>
</defs>
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text { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: bold; font-style: normal; text-decoration: none }
text.PlotXTTitle23 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotYTitle23 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotXValues23, text.PlotVZeroVal23 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotYValues23, text.PlotHZeroVal23 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotLegend23 { font-size: 280; font-family: Times New Roman; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
g.PlotLabels23 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
]]></style>
<line id="PlotGridH23" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" x1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotGridV23" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" y1="46.4084334395685" y2="-46.4084334395685" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotZeroH23" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="visible" stroke-width=".2451581209898" stroke-dasharray="9.806325E-02,1470949" x1="0" x2="100"/>

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visibility="hidden" stroke-width="1" stroke-dasharray="9.806325E-02,1470949" y1="46.4084334395685" y2="-46.4084334395685"/>
fill="rgb(255,255,255)" stroke-width="10"/>
fill="rgb(255,255,255)" stroke-width="10"/>
markerWidth="4" markerHeight="3" orient="auto">
    <path d="M 0 0 L 6 3 L 0 6 z"/>
</marker>
</defs>
<rect class="PlotBorder23" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
<text class="PlotTitle23" text-anchor="middle" x="2700" y="344" visibility="visible">Rotazione Pelvica</text>
<text class="PlotYTitle23" text-anchor="middle" transform="rotate(-90)" x="-2702" y="344" visibility="visible">Angolo
[deg]</text>
<text class="PlotXTitle23" text-anchor="middle" x="2699" y="4942" visibility="visible">cielo [%]</text>
<g class="PlotLabels23" text-anchor="end" visibility="visible" transform="translate(5000,0)">
<text class="PlotLabelUp23" y="745">Int</text>
<text class="PlotLabelDn23" y="4149">Ext</text>
</g>
<g class="PlotLegend23" visibility="hidden" transform="translate(5400,401)">
<rect class="PlotLegend23" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3346" height="4596"/>
</g>
<path class="PlotXAxis23" fill="none" marker-end="url(#PlotAxisArrow23)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4267 H 5000"/>
<path class="PlotYAxis23" fill="none" marker-end="url(#PlotAxisArrow23)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4267 V 481"/>
<g class="PlotXValues23" text-anchor="middle" visibility="visible" transform="translate(921,4560)">
<g class="PlotYValues23" text-anchor="end" visibility="visible" transform="translate(801,4267)">
<g class="PlotXTicks23" visibility="visible" transform="translate(921,4267)">
<g class="PlotYTicks23" visibility="visible" transform="translate(921,4267)">
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40_xa_ym">
<g class="PlotGrid23" transform="translate(0,0)">
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<use xlink:href="#PlotZeroV23"/>
<use xlink:href="#PlotGridH23" y="20"/>
<use xlink:href="#PlotGridH23" y="15"/>
<use xlink:href="#PlotGridV23" x="0"/>
<use xlink:href="#PlotGridV23" x="20"/>
</g>
<g class="PlotData23" fill="none" stroke-linejoin="bevel" transform="translate(0,0)">
<g class="PlotDataStd23" id="23_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#23_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
<use xlink:href="#23_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
</g>
<g class="PlotDataStd23" id="23_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#23_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
<use xlink:href="#23_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
</g>
<g class="PlotDataStd23" id="23_a_28_t_angle_value_1_aMLPROT.M" fill-opacity="0.3"
fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#23_a_28_t_angle_value_1_aMLPROT.M" fill="none"/>
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</g>
<g class="PlotDataStd23" id="23_a_28_t_angle_value_1_aMRPROT.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#23_a_28_t_angle_value_1_aMRPROT.M" fill="none"/>
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</g>
<g class="PlotDataStd23" id="23_a_0_t_angle_cycle_1_aLPROT.MS" fill-opacity="0.3"
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">
<use xlink:href="#23_a_0_t_angle_cycle_1_aLPROT.S" stroke="none"/>
<use xlink:href="#23_a_0_t_angle_cycle_1_aLPROT.M" fill="none"/>
</g>
<g class="PlotDataStd23" id="23_a_0_t_angle_cycle_1_aRPROT.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
<use xlink:href="#23_a_0_t_angle_cycle_1_aRPROT.S" stroke="none"/>
<use xlink:href="#23_a_0_t_angle_cycle_1_aRPROT.M" fill="none"/>
</g>
</g>
</g>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot27" x="2000" y="12400"
width="5400" height="5000">
<title>Plot27</title>
<description>Plot27</description>
<defs>
<style type="text/css"><![CDATA[
text{font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-
weight: bold; font-style: normal; text-decoration: none}
text.PlotXTitle27 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration:
none}
text.PlotYTitle27 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration:
none}
text.PlotXValues27, text.PlotYValues27, text.PlotXZeroVal27 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlotYValues27, text.PlotXZeroVal27 { font-size: 220;
font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlotLegend27 { font-size: 280; font-family: Times New Roman; fill:
rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
g.PlotLabels27 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal;
text-decoration: none}
]]></style>
<line id="PlotGridH27" y1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotGridV27" x1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotZeroH27" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" stroke-width="1" stroke-dasharray="9.806325E-02,1470949" x1="0" x2="100"/>
<line id="PlotZeroV27" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" stroke-width="1" stroke-dasharray="9.806325E-02,1470949" y1="46.3961755332189" y2="-46.3961755332189"/>

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fill="rgb(255,255,255)" stroke-width="10"/>
fill="rgb(255,255,255)" stroke-width="10"/>
markerWidth="4" markerHeight="3" orient="auto">
    <path d="M 0 0 L 6 3 L 0 6 z"/>
</marker>
</defs>
<rect class="PlotBorder27" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
<text class="PlotTitle27" text-anchor="middle" x="2700" y="346" visibility="visible">Anca Abdo-Adduzione</text>
<text class="PlotY Title27" text-anchor="middle" transform="rotate(-90)" x="-2702" y="344" visibility="visible">Angolo
[deg]</text>
<text class="PlotXTitle27" text-anchor="middle" x="2699" y="4942" visibility="visible">cielo [%]</text>
<g class="PlotLabels27" text-anchor="end" visibility="visible" transform="translate(5000,0)">
    <text class="PlotLabelUp27" y="750">Add</text>
    <text class="PlotLabelDn27" y="4151">Abd</text>
</g>
<g class="PlotLegend27" visibility="hidden" transform="translate(5400,404)">
    <rect class="PlotLegend27" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3374" height="4596"/>
</g>
<path class="PlotXAxis27" fill="none" marker-end="url(#PlotAxisArrow27)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4269 H 5000"/>
<path class="PlotYAxis27" fill="none" marker-end="url(#PlotAxisArrow27)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4269 V 484"/>
<g class="PlotXValues27" text-anchor="middle" visibility="visible" transform="translate(921,4561)">
<g class="PlotYValues27" text-anchor="end" visibility="visible" transform="translate(801,4269)">
<g class="PlotXTicks27" visibility="visible" transform="translate(921,4269)">
<g class="PlotYTicks27" visibility="visible" transform="translate(921,4269)">
<svg class="PlotArea27" preserveAspectRatio="none" x="921" y="484" width="4079" height="3785" viewBox="0 -15 100
30 _xa_ym">
    <g class="PlotGrid27" transform="translate(0,0)">
        <use xlink:href="#PlotZeroH27"/>
        <use xlink:href="#PlotZeroV27"/>
        <use xlink:href="#PlotGridH27" y="15"/>
        <use xlink:href="#PlotGridH27" y="10"/>
        <use xlink:href="#PlotGridV27" x="0"/>
        <use xlink:href="#PlotGridV27" x="20"/>
    </g>
    <g class="PlotData27" fill="none" stroke-linejoin="bevel" transform="translate(0,0)">
        <g class="PlotDataStd27" id="27_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
            <use xlink:href="#27_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
            <use xlink:href="#27_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
        </g>
        <g class="PlotDataStd27" id="27_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
            <use xlink:href="#27_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
            <use xlink:href="#27_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
        </g>
        <g class="PlotDataStd27" id="27_a_28_t_angle_value_1_amRHPAA.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
            <use xlink:href="#27_a_28_t_angle_value_1_amRHPAA.M" fill="none"/>
            <use xlink:href="#27_a_28_t_angle_value_1_amRHPAA.S" stroke="none"/>
        </g>
        <g class="PlotDataStd27" id="27_a_28_t_angle_value_1_aMLHPAA.M" fill-opacity="0.3"
fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
            <use xlink:href="#27_a_28_t_angle_value_1_aMLHPAA.M" fill="none"/>
            <use xlink:href="#27_a_28_t_angle_value_1_aMLHPAA.S" stroke="none"/>
        </g>
        <g class="PlotDataStd27" id="27_a_0_t_angle_cycle_1_aLHPAA.MS" fill-opacity="0.3"
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">
            <use xlink:href="#27_a_0_t_angle_cycle_1_aLHPAA.S" stroke="none"/>
            <use xlink:href="#27_a_0_t_angle_cycle_1_aLHPAA.M" fill="none"/>
        </g>
        <g class="PlotDataStd27" id="27_a_0_t_angle_cycle_1_aRHPAA.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
            <use xlink:href="#27_a_0_t_angle_cycle_1_aRHPAA.S" stroke="none"/>
            <use xlink:href="#27_a_0_t_angle_cycle_1_aRHPAA.M" fill="none"/>
        </g>
    </g>
</svg>
</g>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot29" x="7800" y="12400"
width="5400" height="5000">
    <title>Plot29</title>
    <description>Plot29</description>
    <defs>
        <style type="text/css"><![CDATA[
text { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: bold; font-style: normal; text-decoration: none }
text.PlotXTitle29 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotYTitle29 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotXValues29, text.PlotYValues29, text.PlotHZeroVal29 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotLegend29 { font-size: 280; font-family: Times New Roman; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
g.PlotLabels29 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
]]></style>
        <line id="PlotGridH29" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" x1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
        <line id="PlotGridV29" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" y1="9.98469979951462" y2="-79.8775983961169" stroke-width="1" stroke-dasharray="4,6"/>
        <line id="PlotZeroH29" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="visible" stroke-width="2.37416908144951" stroke-dasharray="9.496676E-02,1424501" x1="0" x2="100"/>
        <line id="PlotZeroV29" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" stroke-width="2.37416908144951" stroke-dasharray="9.496676E-02,1424501" y1="9.98469979951462" y2="-79.8775983961169"/>
        <line id="PlotXTick29" x1="0" x2="0" y1="0" y2="40" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
    </defs>

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<line id="PlotYTick29" x1="0" y1="0" x2="-36" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
<marker id="PlotAxisArrow29" viewBox="0 0 6 6" refX="0" refY="3" markerUnits="strokeWidth"
<path d="M 0 0 L 6 3 L 0 6 z"/>
</marker>
</defs>
<rect class="PlotBorder29" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
<text class="PlotTitle29" text-anchor="middle" x="2700" y="346" visibility="visible">Anca Flesso-Estensione</text>
<text class="PlotYTitle29" text-anchor="middle" transform="rotate(-90)" x="-2702" y="344" visibility="visible">Angolo
[deg]</text>
<text class="PlotXTitle29" text-anchor="middle" x="2699" y="4942" visibility="visible">ciclo [%]</text>
<g class="PlotLabels29" text-anchor="end" visibility="visible" transform="translate(5000,0)">
<text class="PlotLabelUp29" y="750">Fles</text>
<text class="PlotLabelDn29" y="4151">Est</text>
</g>
<g class="PlotLegend29" visibility="hidden" transform="translate(5400,404)">
<rect class="PlotLegend29" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3295" height="4596"/>
</g>
<path class="PlotXAxis29" fill="none" marker-end="url(#PlotAxisArrow29)" stroke="rgb(0,0,0)" stroke-width="20" d="M
788 4269 H 5000"/>
<path class="PlotYAxis29" fill="none" marker-end="url(#PlotAxisArrow29)" stroke="rgb(0,0,0)" stroke-width="20" d="M
788 4269 V 484"/>
<g class="PlotXValues29" text-anchor="middle" visibility="visible" transform="translate(788,4561)">
<g class="PlotYValues29" text-anchor="end" visibility="visible" transform="translate(668,4269)">
<g class="PlotXTicks29" visibility="visible" transform="translate(788,4269)">
<g class="PlotYTicks29" visibility="visible" transform="translate(788,4269)">
<svg class="PlotArea29" preserveAspectRatio="none" x="788" y="484" width="4212" height="3785" viewBox="0 -5 100 45
_xa_ym">
<g class="PlotGrid29" transform="translate(0,69.8929)">
<use xlink:href="#PlotZeroH29"/>
<use xlink:href="#PlotZeroV29"/>
<use xlink:href="#PlotGridH29" y="5"/>
<use xlink:href="#PlotGridV29" x="0"/>
<use xlink:href="#PlotGridH29" y="0"/>
<use xlink:href="#PlotGridV29" x="0"/>
<use xlink:href="#PlotGridV29" x="20"/>
</g>
<g class="PlotData29" fill="none" stroke-linejoin="bevel" transform="translate(0,69.8929)">
<g class="PlotDataStd29" id="29_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#29_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
<use xlink:href="#29_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
</g>
<g class="PlotDataStd29" id="29_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#29_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
<use xlink:href="#29_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
</g>
<g class="PlotDataStd29" id="29_a_28_t_angle_value_1_amRHPFE.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#29_a_28_t_angle_value_1_amRHPFE.M" fill="none"/>
<use xlink:href="#29_a_28_t_angle_value_1_amRHPFE.S" stroke="none"/>
</g>
<g class="PlotDataStd29" id="29_a_28_t_angle_value_1_amLHPFE.M" fill-opacity="0.3"
fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#29_a_28_t_angle_value_1_amLHPFE.M" fill="none"/>
<use xlink:href="#29_a_28_t_angle_value_1_amLHPFE.S" stroke="none"/>
</g>
<g class="PlotDataStd29" id="29_a_0_t_angle_cycle_1_aLHPFE.MS" fill-opacity="0.3"
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">
<use xlink:href="#29_a_0_t_angle_cycle_1_aLHPFE.S" stroke="none"/>
<use xlink:href="#29_a_0_t_angle_cycle_1_aLHPFE.M" fill="none"/>
</g>
<g class="PlotDataStd29" id="29_a_0_t_angle_cycle_1_aRHPFE.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
<use xlink:href="#29_a_0_t_angle_cycle_1_aRHPFE.S" stroke="none"/>
<use xlink:href="#29_a_0_t_angle_cycle_1_aRHPFE.M" fill="none"/>
</g>
</g>
</svg>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot31" x="13600" y="12400"
width="5400" height="5000">
<title>Plot31</title>
<description>Plot31</description>
<defs>
<style type="text/css"><![CDATA[
text { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: bold; font-style: normal; text-decoration: none }
text.PlotTitle31 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotYTitle31 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotXValues31, text.PlotYZeroVal31 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotYValues31, text.PlotHZeroVal31 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotLegend31 { font-size: 280; font-family: Times New Roman; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.PlotLabels31 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
]]></style>
<line id="PlotGridH31" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" x1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotGridV31" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" y1="9.98469979951462" y2="-79.8775983961169" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotZeroH31" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
stroke-width="1" stroke-dasharray="9.496676E-02,1424501" x1="0" x2="100"/>
<line id="PlotZeroV31" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
stroke-width="1" stroke-dasharray="9.496676E-02,1424501" x1="0" x2="100"/>
<line id="PlotXTick31" x1="0" y1="0" x2="0" y2="40" fill-opacity="0.0" stroke="rgb(0,0,0)"
visibility="hidden" stroke-width="1" stroke-dasharray="9.496676E-02,1424501" x1="0" x2="0" y1="0" y2="40" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
<line id="PlotYTick31" x1="0" y1="0" x2="-36" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>

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<marker id="PlotAxisArrow31" viewBox="0 0 6 6" refX="0" refY="3" markerUnits="strokeWidth"
markerWidth="4" markerHeight="3" orient="auto">
    <path d="M 0 0 L 6 3 L 0 6 z"/>
</marker>
</defs>
<rect class="PlotBorder31" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
<text class="PlotTitle31" text-anchor="middle" x="2700" y="346" visibility="visible">Anca Intra-Extrarotazione</text>
<text class="PlotYTitle31" text-anchor="middle" transform="rotate(-90)" x="-2702" y="344" visibility="visible">Angolo
[deg]</text>
<text class="PlotXTitle31" text-anchor="middle" x="2699" y="4942" visibility="visible">sciclo [%]</text>
<g class="PlotLabels31" text-anchor="end" visibility="visible" transform="translate(5000,0)">
<text class="PlotLabelUp31" y="750">Int</text>
<text class="PlotLabelDn31" y="4151">Ext</text>
</g>
<g class="PlotLegend31" visibility="hidden" transform="translate(5400,404)">
<rect class="PlotLegend31" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3242" height="4596"/>
</g>
<path class="PlotXAxis31" fill="none" marker-end="url(#PlotAxisArrow31)" stroke="rgb(0,0,0)" stroke-width="20" d="M
788 4269 H 5000"/>
<path class="PlotYAxis31" fill="none" marker-end="url(#PlotAxisArrow31)" stroke="rgb(0,0,0)" stroke-width="20" d="M
788 4269 V 484"/>
<g class="PlotXValues31" text-anchor="middle" visibility="visible" transform="translate(788,4561)/>
<g class="PlotYValues31" text-anchor="end" visibility="visible" transform="translate(668,4269)/>
<g class="PlotXTicks31" visibility="visible" transform="translate(788,4269)/>
<g class="PlotYTicks31" visibility="visible" transform="translate(788,4269)/>
<svg class="PlotArea31" preserveAspectRatio="none" x="788" y="484" width="4212" height="3785" viewBox="0 -5 100 45
_xa_ym">
    <g class="PlotGrid31" transform="translate(0,69.8929)">
    <use xlink:href="#PlotZeroH31"/>
    <use xlink:href="#PlotZeroV31"/>
    <use xlink:href="#PlotGridH31" y="5"/>
    <use xlink:href="#PlotGridH31" x="0"/>
    <use xlink:href="#PlotGridV31" x="0"/>
    <use xlink:href="#PlotGridV31" x="20"/>
    </g>
    <g class="PlotData31" fill="none" stroke-linejoin="bevel" transform="translate(0,69.8929)">
    <g class="PlotDataStd31" id="31_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
        <use xlink:href="#31_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
        <use xlink:href="#31_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
    </g>
    <g class="PlotDataStd31" id="31_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
        <use xlink:href="#31_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
        <use xlink:href="#31_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
    </g>
    <g class="PlotDataStd31" id="31_a_28_t_angle_value_1_amRHPIE.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
        <use xlink:href="#31_a_28_t_angle_value_1_amRHPIE.M" fill="none"/>
        <use xlink:href="#31_a_28_t_angle_value_1_amRHPIE.S" stroke="none"/>
    </g>
    <g class="PlotDataStd31" id="31_a_28_t_angle_value_1_aLHPIE.M" fill-opacity="0.3"
fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
        <use xlink:href="#31_a_28_t_angle_value_1_aLHPIE.M" fill="none"/>
        <use xlink:href="#31_a_28_t_angle_value_1_aLHPIE.S" stroke="none"/>
    </g>
    <g class="PlotDataStd31" id="31_a_0_t_angle_cycle_1_aLHPIE.MS" fill-opacity="0.3"
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">
        <use xlink:href="#31_a_0_t_angle_cycle_1_aLHPIE.S" stroke="none"/>
        <use xlink:href="#31_a_0_t_angle_cycle_1_aLHPIE.M" fill="none"/>
    </g>
    <g class="PlotDataStd31" id="31_a_0_t_angle_cycle_1_aRHPIE.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
        <use xlink:href="#31_a_0_t_angle_cycle_1_aRHPIE.S" stroke="none"/>
        <use xlink:href="#31_a_0_t_angle_cycle_1_aRHPIE.M" fill="none"/>
    </g>
    </g>
</svg>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot33" x="7800" y="17600"
width="5400" height="5000">
    <title>Plot33</title>
    <description>Plot33</description>
    <defs>
    <style type="text/css"><![CDATA[
text{font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: bold; font-style: normal; text-decoration: none}
text.PlotXTTitle33 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlotYTitle33 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlotXValues33, text.PlotYValues33, text.PlotZeroVal33 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlotXTicks33, text.PlotYTicks33 { font-size: 280; font-family: Times New Roman; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
g.PlotLabels33 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
]]></style>
    <line id="PlotGridH33" x1="0" x2="100" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden"/>
    <line id="PlotGridV33" x1="0" x2="0" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden"/>
    <line id="PlotZeroH33" x1="0" x2="0" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden"/>
    <line id="PlotZeroV33" x1="0" x2="0" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden"/>
    <line id="PlotXTick33" x1="0" x2="0" y1="0" y2="40" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
    <line id="PlotYTick33" x1="0" x2="-36" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
    <marker id="PlotAxisArrow33" viewBox="0 0 6 6" refX="0" refY="3" markerUnits="strokeWidth"
markerWidth="4" markerHeight="3" orient="auto">

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    <path d="M 0 0 L 6 3 L 0 6 z"/>
  </marker>
</defs>
<rect class="PlotBorder33" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
<text class="PlotTitle33" text-anchor="middle" x="2700" y="346" visibility="visible">Ginocchio Flesso-Estensione</text>
<text class="PlotYTitle33" text-anchor="middle" transform="rotate(-90)" x="-2702" y="344" visibility="visible">Angolo
[deg]</text>
<text class="PlotXTitle33" text-anchor="middle" x="2699" y="4942" visibility="visible">ciclo [%]</text>
<g class="PlotLabels33" text-anchor="end" visibility="visible" transform="translate(5000,0)">
  <text class="PlotLabelUp33" y="750">Fles</text>
  <text class="PlotLabelDn33" y="4151">Est</text>
</g>
<g class="PlotLegend33" visibility="hidden" transform="translate(5400,404)">
  <rect class="PlotLegend33" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3108" height="4596"/>
</g>
<path class="PlotXAxis33" fill="none" marker-end="url(#PlotAxisArrow33)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4269 H 5000"/>
<path class="PlotYAxis33" fill="none" marker-end="url(#PlotAxisArrow33)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4269 V 484"/>
<g class="PlotXValues33" text-anchor="middle" visibility="visible" transform="translate(921,4561)">
<g class="PlotYValues33" text-anchor="end" visibility="visible" transform="translate(801,4269)">
<g class="PlotXTicks33" visibility="visible" transform="translate(921,4269)">
<g class="PlotYTicks33" visibility="visible" transform="translate(921,4269)">
<svg class="PlotArea33" preserveAspectRatio="none" x="921" y="484" width="4079" height="3785" viewBox="0 -15 100
75 _xa_ym">
  <g class="PlotGrid33" transform="translate(0,55.67541)">
    <use xlink:href="#PlotZeroH33"/>
    <use xlink:href="#PlotZeroV33"/>
    <use xlink:href="#PlotGridH33" y="15"/>
    <use xlink:href="#PlotGridH33" y="5"/>
    <use xlink:href="#PlotGridV33" x="0"/>
    <use xlink:href="#PlotGridV33" x="20"/>
  </g>
  <g class="PlotData33" fill="none" stroke-linejoin="bevel" transform="translate(0,55.67541)">
    <g class="PlotDataStd33" id="33_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
      <use xlink:href="#33_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
      <use xlink:href="#33_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
    </g>
    <g class="PlotDataStd33" id="33_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
      <use xlink:href="#33_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
      <use xlink:href="#33_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
    </g>
    <g class="PlotDataStd33" id="33_a_28_t_angle_value_1_aMLKFE.M" fill-opacity="0.3"
fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
      <use xlink:href="#33_a_28_t_angle_value_1_aMLKFE.M" fill="none"/>
      <use xlink:href="#33_a_28_t_angle_value_1_aMLKFE.S" stroke="none"/>
    </g>
    <g class="PlotDataStd33" id="33_a_28_t_angle_value_1_aMRKFE.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
      <use xlink:href="#33_a_28_t_angle_value_1_aMRKFE.M" fill="none"/>
      <use xlink:href="#33_a_28_t_angle_value_1_aMRKFE.S" stroke="none"/>
    </g>
    <g class="PlotDataStd33" id="33_a_0_t_angle_cycle_1_aLKFE.MS" fill-opacity="0.3"
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">
      <use xlink:href="#33_a_0_t_angle_cycle_1_aLKFE.S" stroke="none"/>
      <use xlink:href="#33_a_0_t_angle_cycle_1_aLKFE.M" fill="none"/>
    </g>
    <g class="PlotDataStd33" id="33_a_0_t_angle_cycle_1_aRKFE.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
      <use xlink:href="#33_a_0_t_angle_cycle_1_aRKFE.S" stroke="none"/>
      <use xlink:href="#33_a_0_t_angle_cycle_1_aRKFE.M" fill="none"/>
    </g>
  </g>
</svg>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Table" id="Table32_r11_c3" x="2000"
y="17600" width="5400" height="10200">
  <title>Table32</title>
  <description>Table32</description>
  <defs>
    <line id="TableGridH32" x1="0" y1="0" x2="100%" y2="0"/>
    <line id="TableGridV32" x1="0" x2="0" y2="100%" y1="593"/>
  </defs>
  <rect class="TableBorder32" x="5" y="5" stroke="none" fill="rgb(255,255,255)" width="5390" height="10190"/>
  <g class="TableGrid32" visibility="visible" stroke="rgb(0,0,0)">
    <use xlink:href="#TableGridH32" y="593"/>
    <use xlink:href="#TableGridH32" y="1466"/>
    <use xlink:href="#TableGridH32" y="2339"/>
    <use xlink:href="#TableGridH32" y="3212"/>
    <use xlink:href="#TableGridH32" y="4085"/>
    <use xlink:href="#TableGridH32" y="4958"/>
    <use xlink:href="#TableGridH32" y="5830"/>
    <use xlink:href="#TableGridH32" y="6703"/>
    <use xlink:href="#TableGridH32" y="7576"/>
    <use xlink:href="#TableGridH32" y="8449"/>
    <use xlink:href="#TableGridH32" y="9322"/>
    <use xlink:href="#TableGridH32" y="10199"/>
    <use xlink:href="#TableGridV32" x="5"/>
    <use xlink:href="#TableGridV32" x="3201"/>
    <use xlink:href="#TableGridV32" x="4286"/>
    <use xlink:href="#TableGridV32" x="5399"/>
  </g>

```



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<ref xlink:href="#CL32_a_28_t_angle_value_1_amLAIE.M"/>
</text>
<text id="cell32_r_11_c_1" header="true" y="9875" x="111" text-anchor="start" font-size="280" font-family="Verdana"
fill="rgb(0,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCell32">Caviglia Dors-Plant</text>
<text id="cell32_r_11_c_2" header="false" y="9875" x="3743.5" text-anchor="middle" font-size="280" font-
family="Verdana" fill="rgb(0,255,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink32">
<ref xlink:href="#CL32_a_28_t_angle_value_1_amRAFE.M"/>
</text>
<text id="cell32_r_11_c_3" header="false" y="9875" x="4842.5" text-anchor="middle" font-size="280" font-
family="Verdana" fill="rgb(255,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCLink32">
<ref xlink:href="#CL32_a_28_t_angle_value_1_amLAFE.M"/>
</text>
</text>
<svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot41" x="7800" y="22800"
width="5400" height="5000">
<title>Plot41</title>
<description>Plot41</description>
<defs>
<style type="text/css"><![CDATA[
text.PlottTitle41 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-
weight: bold; font-style: normal; text-decoration: none; }
text.PlottXTitle41 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none; }
text.PlottYTitle41 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none; }
text.PlottXValues41, text.PlottYZeroVal41 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none; }
text.PlottYValues41, text.PlottHZeroVal41 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none; }
text.PlottLegend41 { font-size: 280; font-family: Times New Roman; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none; }
g.PlottLabels41 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none; }
]]></style>
<line id="PlotGridH41" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" x1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotGridV41" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" y1="61.7961918770941" y2="-30.898095938547" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotZeroH41" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="visible" stroke-width="9.806325E-02,1470949" x1="0" x2="100"/>
<line id="PlotZeroV41" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" stroke-width="9.806325E-02,1470949" y1="61.7961918770941" y2="-30.898095938547"/>
<line id="PlotXTick41" x1="0" y1="0" x2="0" y2="40" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
<line id="PlotYTick41" x1="0" y1="0" x2="-36" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
<marker id="PlotAxisArrow41" viewBox="0 0 6 6" refX="0" refY="3" markerUnits="strokeWidth"
markerWidth="4" markerHeight="3" orient="auto">
<path d="M 0 0 L 6 3 L 0 6 z"/>
</marker>
</defs>
<rect class="PlotBorder41" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
<text class="PlottTitle41" text-anchor="middle" x="2700" y="344" visibility="visible">Caviglia Dors-Plantaflusione</text>
<text class="PlottYTitle41" text-anchor="middle" transform="rotate(-90)" x="2702" y="344" visibility="visible">Angolo
[deg]</text>
<text class="PlottXTitle41" text-anchor="middle" x="2699" y="4942" visibility="visible">cielo [%]</text>
<g class="PlottLabels41" text-anchor="end" visibility="visible" transform="translate(5000,0)">
<text class="PlottLabelUp41" y="750">Dors</text>
<text class="PlottLabelDn41" y="4149">Pla</text>
</g>
<g class="PlottLegend41" visibility="hidden" transform="translate(5400,406)">
<rect class="PlottLegend41" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3462" height="4596"/>
</g>
<path class="PlottXAxis41" fill="none" marker-end="url(#PlotAxisArrow41)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4267 H 5000"/>
<path class="PlottYAxis41" fill="none" marker-end="url(#PlotAxisArrow41)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4267 V 486"/>
<g class="PlottXValues41" text-anchor="middle" visibility="visible" transform="translate(921,4560)">
<g class="PlottYValues41" text-anchor="end" visibility="visible" transform="translate(801,4267)">
<g class="PlottXTicks41" visibility="visible" transform="translate(921,4267)">
<g class="PlottYTicks41" visibility="visible" transform="translate(921,4267)">
<svg class="PlottArea41" preserveAspectRatio="none" x="921" y="486" width="4079" height="3781" viewBox="0 -60 100
90_xa_ym">
<g class="PlottGrid41" transform="translate(0,-30.8981)">
<use xlink:href="#PlotZeroH41"/>
<use xlink:href="#PlotZeroV41"/>
<use xlink:href="#PlotGridH41" y="60"/>
<use xlink:href="#PlotGridV41" x="45"/>
<use xlink:href="#PlotGridV41" x="0"/>
<use xlink:href="#PlotGridV41" x="20"/>
</g>
<g class="PlottData41" fill="none" stroke-linejoin="bevel" transform="translate(0,-30.8981)">
<g class="PlottDataStd41" id="41_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#41_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
<use xlink:href="#41_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
</g>
<g class="PlottDataStd41" id="41_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#41_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
<use xlink:href="#41_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
</g>
<g class="PlottDataStd41" id="41_a_28_t_angle_value_1_amLAFE.M" fill-opacity="0.3"
fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#41_a_28_t_angle_value_1_amLAFE.M" fill="none"/>
<use xlink:href="#41_a_28_t_angle_value_1_amLAFE.S" stroke="none"/>
</g>
<g class="PlottDataStd41" id="41_a_28_t_angle_value_1_amRAFE.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#41_a_28_t_angle_value_1_amRAFE.M" fill="none"/>
<use xlink:href="#41_a_28_t_angle_value_1_amRAFE.S" stroke="none"/>
</g>
<g class="PlottDataStd41" id="41_a_0_t_angle_cycle_1_aLAFE.MS" fill-opacity="0.3"
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">

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        <use xlink:href="#41_a_0_t_angle_cycle_1_aLAFE.S" stroke="none"/>
        <use xlink:href="#41_a_0_t_angle_cycle_1_aLAFE.M" fill="none"/>
    </g>
    <g class="PlotDataStd41" id="41_a_0_t_angle_cycle_1_aRAFE.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
        <use xlink:href="#41_a_0_t_angle_cycle_1_aRAFE.S" stroke="none"/>
        <use xlink:href="#41_a_0_t_angle_cycle_1_aRAFE.M" fill="none"/>
    </g>
</g>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot43" x="13600" y="22800"
width="5400" height="5000">
    <title>Plot43</title>
    <description>Plot43</description>
    <defs>
        <style type="text/css"><![CDATA[
text.FontTitle43 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: bold; font-style: normal; text-decoration: none }
text.FontXTTitle43 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.FontYTTitle43 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.FontXValues43, text.FontVZeroVal43 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.FontYValues43, text.FontHZeroVal43 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
text.FontLegend43 { font-size: 280; font-family: Times New Roman; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
g.FontLabels43 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none }
]]></style>
        <line id="PlotGridH43" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" x1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
        <line id="PlotGridV43" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" y1="61.877911252758" y2="-30.938955626379" stroke-width="1" stroke-dasharray="4,6"/>
        <line id="PlotZeroH43" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="visible" stroke-width="2.451581209898" stroke-dasharray="9.806325E-02,1470949" x1="0" x2="100"/>
        <line id="PlotZeroV43" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" stroke-width="2.451581209898" stroke-dasharray="9.806325E-02,1470949" y1="61.877911252758" y2="-30.938955626379"/>
        <line id="PlotXTick43" x1="0" y1="0" x2="0" y2="40" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
        <line id="PlotYTick43" x1="0" y1="0" x2="-36" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
        <marker id="PlotAxisArrow43" viewBox="0 0 6 6" refX="0" refY="3" markerUnits="strokeWidth"
markerWidth="4" markerHeight="3" orient="auto">
            <path d="M 0 0 L 6 3 L 0 6 z"/>
        </marker>
        <rect class="PlotBorder43" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
        <text class="PlotTitle43" text-anchor="middle" x="2700" y="344" visibility="visible">Progressione del Piede</text>
        <text class="PlotYTitle43" text-anchor="middle" transform="rotate(-90)" x="-2702" y="344" visibility="visible">Angolo
[deg]</text>
        <text class="PlotXTTitle43" text-anchor="middle" x="2699" y="4942" visibility="visible">cielo [%]</text>
        <g class="PlotLabels43" text-anchor="end" visibility="visible" transform="translate(5000,0)">
            <text class="PlotLabelUp43" y="745">Int</text>
            <text class="PlotLabelDn43" y="4149">Ext</text>
        </g>
        <g class="PlotLegend43" visibility="hidden" transform="translate(5400,401)">
            <rect class="PlotLegend43" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3055" height="4596"/>
        </g>
        <path class="PlotXAxis43" fill="none" marker-end="url(#PlotAxisArrow43)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4267 H 5000"/>
        <path class="PlotYAxis43" fill="none" marker-end="url(#PlotAxisArrow43)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4267 V 481"/>
        <g class="PlotXValues43" text-anchor="middle" visibility="visible" transform="translate(921,4560)">
        <g class="PlotYValues43" text-anchor="end" visibility="visible" transform="translate(801,4267)">
        <g class="PlotXTicks43" visibility="visible" transform="translate(921,4267)">
        <g class="PlotYTicks43" visibility="visible" transform="translate(921,4267)">
        <svg class="PlotArea43" preserveAspectRatio="none" x="921" y="481" width="4079" height="3786" viewBox="0 -40 100
60_xa_ym">
            <g class="PlotGrid43" transform="translate(0,-30.93896)">
                <use xlink:href="#PlotZeroH43"/>
                <use xlink:href="#PlotZeroV43"/>
                <use xlink:href="#PlotGridH43" y="40"/>
                <use xlink:href="#PlotGridV43" x="30"/>
                <use xlink:href="#PlotGridV43" x="0"/>
                <use xlink:href="#PlotGridV43" x="20"/>
            </g>
            <g class="PlotData43" fill="none" stroke-linejoin="bevel" transform="translate(0,-30.93896)">
                <g class="PlotDataStd43" id="43_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
                    <use xlink:href="#43_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
                    <use xlink:href="#43_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
                </g>
                <g class="PlotDataStd43" id="43_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
                    <use xlink:href="#43_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
                    <use xlink:href="#43_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
                </g>
                <g class="PlotDataStd43" id="43_a_28_t_angle_value_1_amRAIE.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
                    <use xlink:href="#43_a_28_t_angle_value_1_amRAIE.M" fill="none"/>
                    <use xlink:href="#43_a_28_t_angle_value_1_amRAIE.S" stroke="none"/>
                </g>
                <g class="PlotDataStd43" id="43_a_28_t_angle_value_1_amLAIE.M" fill-opacity="0.3"
fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
                    <use xlink:href="#43_a_28_t_angle_value_1_amLAIE.M" fill="none"/>
                    <use xlink:href="#43_a_28_t_angle_value_1_amLAIE.S" stroke="none"/>
                </g>
                <g class="PlotDataStd43" id="43_a_0_t_angle_cycle_1_aRAIE.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
                    <use xlink:href="#43_a_0_t_angle_cycle_1_aRAIE.S" stroke="none"/>
                    <use xlink:href="#43_a_0_t_angle_cycle_1_aRAIE.M" fill="none"/>
                </g>
            </g>
    </svg>

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</g>
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">
<g class="PlotDataStd43" id="43_a_0_t_angle_cycle_1_aLAIE.MS" fill-opacity="0.3"
<use xlink:href="#43_a_0_t_angle_cycle_1_aLAIE.S" stroke="none"/>
<use xlink:href="#43_a_0_t_angle_cycle_1_aLAIE.M" fill="none"/>
</g>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Plot" id="Plot45" x="2000" y="7200"
width="5400" height="5000">
<title>Plot45</title>
<description>Plot45</description>
<defs>
<style type="text/css"><![CDATA[
text.PlottTitle45 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: bold; font-style: normal; text-decoration: none}
text.PlottXTTitle45 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlottYTitle45 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlottXValues45, text.PlottYValues45, text.PlottZeroVal45 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlottXZeroVal45, text.PlottYZeroVal45 { font-size: 220; font-family: Courier New; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
text.PlottLegend45 { font-size: 280; font-family: Times New Roman; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
g.PlottLabels45 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight: normal; font-style: normal; text-decoration: none}
]]></style>
<line id="PlotGridH45" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" x1="0" x2="100" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotGridV45" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="hidden" y1="46.3471439078205" y2="-46.3471439078205" stroke-width="1" stroke-dasharray="4,6"/>
<line id="PlotZeroH45" y1="0" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="visible" stroke-width="2.451581209898" stroke-dasharray="9.806325E-02,1470949" x1="0" x2="100"/>
<line id="PlotZeroV45" x1="0" x2="0" fill-opacity="0.0" stroke="rgb(0,0,0)" fill="rgb(255,255,255)"
visibility="visible" stroke-width="2.451581209898" stroke-dasharray="9.806325E-02,1470949" y1="46.3471439078205" y2="-46.3471439078205"/>
<line id="PlotXTick45" x1="0" y1="0" x2="0" y2="40" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
<line id="PlotYTick45" x1="0" y1="0" x2="-36" y2="0" fill-opacity="0.0" stroke="rgb(0,0,0)"
fill="rgb(255,255,255)" stroke-width="10"/>
<marker id="PlotAxisArrow45" viewBox="0 0 6 6" refX="0" refY="3" markerUnits="strokeWidth"
markerWidth="4" markerHeight="3" orient="auto">
<path d="M 0 0 L 6 3 L 0 6 z"/>
</marker>
</defs>
<rect class="PlotBorder45" x="5" y="5" width="5390" height="4990" stroke="rgb(0,0,0)" fill="rgb(255,255,255)" stroke-
opacity="1.0"/>
<text class="PlotTitle45" text-anchor="middle" x="2700" y="344" visibility="visible">Obliquità Pelvica</text>
<text class="PlotYTitle45" text-anchor="middle" transform="rotate(-90)" x="-2702" y="344" visibility="visible">Angolo
[deg]</text>
<text class="PlotXTTitle45" text-anchor="middle" x="2699" y="4942" visibility="visible">ciclo [%]</text>
<g class="PlotLabels45" text-anchor="end" visibility="visible" transform="translate(5000,0)">
<text class="PlotLabelUp45" y="750">Alta</text>
<text class="PlotLabelDn45" y="4149">Bassa</text>
</g>
<g class="PlotLegend45" visibility="hidden" transform="translate(5400,406)">
<rect class="PlotLegend45" x="0" y="0" fill-opacity="0" stroke-opacity="0" width="3782" height="4596"/>
</g>
<path class="PlotXAxis45" fill="none" marker-end="url(#PlotAxisArrow45)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4267 H 5000"/>
<path class="PlotYAxis45" fill="none" marker-end="url(#PlotAxisArrow45)" stroke="rgb(0,0,0)" stroke-width="20" d="M
921 4267 V 486"/>
<g class="PlotXValues45" text-anchor="middle" visibility="visible" transform="translate(921,4560)">
<g class="PlotYValues45" text-anchor="end" visibility="visible" transform="translate(801,4267)">
<g class="PlotXTicks45" visibility="visible" transform="translate(921,4267)">
<g class="PlotYTicks45" visibility="visible" transform="translate(921,4267)">
<svg class="PlotArea45" preserveAspectRatio="none" x="921" y="486" width="4079" height="3781" viewBox="0 -15 100
30_xa_ym">
<g class="PlotGrid45" transform="translate(0,0)">
<use xlink:href="#PlotZeroH45"/>
<use xlink:href="#PlotZeroV45"/>
<use xlink:href="#PlotGridH45" y="15"/>
<use xlink:href="#PlotGridH45" y="10"/>
<use xlink:href="#PlotGridV45" x="0"/>
<use xlink:href="#PlotGridV45" x="20"/>
</g>
<g class="PlotData45" fill="none" stroke-linejoin="bevel" transform="translate(0,0)">
<g class="PlotDataStd45" id="45_a_0_t_event_cycle_1_eRTO.MS" fill-opacity="0.3"
stroke="rgb(154,205,50)" fill="rgb(154,205,50)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#45_a_0_t_event_cycle_1_eRTO.S" stroke="none"/>
<use xlink:href="#45_a_0_t_event_cycle_1_eRTO.M" fill="none"/>
</g>
<g class="PlotDataStd45" id="45_a_0_t_event_cycle_1_eLTO.MS" fill-opacity="0.3"
stroke="rgb(220,20,60)" fill="rgb(220,20,60)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#45_a_0_t_event_cycle_1_eLTO.S" stroke="none"/>
<use xlink:href="#45_a_0_t_event_cycle_1_eLTO.M" fill="none"/>
</g>
<g class="PlotDataStd45" id="45_a_0_t_angle_cycle_1_aLPOBLI.MS" fill-opacity="0.3"
stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="2" stroke-dasharray="none">
<use xlink:href="#45_a_0_t_angle_cycle_1_aLPOBLI.S" stroke="none"/>
<use xlink:href="#45_a_0_t_angle_cycle_1_aLPOBLI.M" fill="none"/>
</g>
<g class="PlotDataStd45" id="45_a_0_t_angle_cycle_1_aRPOBLI.MS" fill-opacity="0.3"
stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="2" stroke-dasharray="none">
<use xlink:href="#45_a_0_t_angle_cycle_1_aRPOBLI.S" stroke="none"/>
<use xlink:href="#45_a_0_t_angle_cycle_1_aRPOBLI.M" fill="none"/>
</g>
<g class="PlotDataStd45" id="45_a_28_t_angle_value_1_amRPOBLI.M" fill-opacity="0.3"
fill="rgb(0,255,0)" stroke="rgb(0,255,0)" stroke-width="1" stroke-dasharray="none">
<use xlink:href="#45_a_28_t_angle_value_1_amRPOBLI.M" fill="none"/>
<use xlink:href="#45_a_28_t_angle_value_1_amRPOBLI.S" stroke="none"/>
</g>
</g>

```

```

fill="rgb(255,0,0)" stroke="rgb(255,0,0)" stroke-width="1" stroke-dasharray="none">
    <g class="PlotDataStd45" id="45_a_28_t_angle_value_1_aMLPOBLI.M" fill-opacity="0.3"
    <use xlink:href="#45_a_28_t_angle_value_1_aMLPOBLI.M" fill="none"/>
    <use xlink:href="#45_a_28_t_angle_value_1_aMLPOBLI.S" stroke="none"/>
    </g>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Legend" id="Legend2" x="14000"
y="19200" width="4200" height="2000">
    <title>Legend2</title>
    <description>Legend2</description>
    <defs>
    <style type="text/css"><![CDATA[
    text { font-size: 360; font-family: Times New Roman; fill:
    rgb(0,0,0); font-weight: bold; font-style: normal; text-decoration: none }
    text.LegendLabels2, text.LegendLLinks2 { font-size: 280; font-family: Verdana; fill: rgb(0,0,0); font-weight:
    normal; font-style: normal; text-decoration: none } ]></style>
    <line id="LegendLine2" x1="300" y1="0" y2="0" fill-opacity="0.0" stroke-opacity="1.0" x2="2506"/>
    </defs>
    <rect class="LegendBorder2" x="5" y="5" stroke-width="20" width="4190" height="1990" fill="rgb(255,255,255)"
stroke="rgb(255,0,0)" stroke-opacity="0.0"/>
    <text class="LegendTitle2" text-anchor="middle" x="2100" visibility="hidden" y="399"/>
    <g class="LegendLines2" visibility="visible">
    <use xlink:href="#LegendLine2" stroke="rgb(0,255,0)" fill="rgb(0,255,0)" stroke-width="20" stroke-
dasharray="none"/>
    <use xlink:href="#LegendLine2" stroke="rgb(255,0,0)" fill="rgb(255,0,0)" stroke-width="20" stroke-
dasharray="none"/>
    </g>
    <g class="LegendLabels2" text-anchor="start" transform="translate(2706,0)">
    <text class="LegendLabels2">Lato DX</text>
    <text class="LegendLabels2">Lato SX</text>
    </g>
</svg>
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" class="Table" x="2000" y="2000" width="10600"
height="2400" id="Table33_r3_c2">
    <title>Table33</title>
    <description>Table33</description>
    <defs>
    <line id="TableGridH33" x1="0" y1="0" x2="100%" y2="0"/>
    <line id="TableGridV33" x1="0" x2="0" y2="100%" y1="593"/>
    </defs>
    <rect class="TableBorder33" x="5" y="5" width="10590" height="2390" stroke="none" fill="rgb(255,255,255)">
    <g class="TableGrid33" visibility="visible" stroke="rgb(0,0,0)">
    <use xlink:href="#TableGridH33" y="593"/>
    <use xlink:href="#TableGridH33" y="1196"/>
    <use xlink:href="#TableGridH33" y="1799"/>
    <use xlink:href="#TableGridH33" y="2399"/>
    <use xlink:href="#TableGridV33" x="5"/>
    <use xlink:href="#TableGridV33" x="3439"/>
    <use xlink:href="#TableGridV33" x="10599"/>
    </g>
    <text class="TableTitle33" visibility="visible" y="504" x="5300" text-anchor="middle" font-size="420" font-family="Times
New Roman" fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none"/>
    <text id="cell33_r_1_c_1" header="true" y="1036" x="137" text-anchor="start" font-size="360" font-family="Verdana"
fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell33">PAZIENTE</text>
    <text id="cell33_r_1_c_2" header="false" y="1027" x="3518" text-anchor="start" font-size="360" font-family="Times New
Roman" fill="rgb(0,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCell33">
    <text id="cell33_r_2_c_1" header="true" y="1639" x="137" text-anchor="start" font-size="360" font-family="Verdana"
fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell33">
    <text id="cell33_r_2_c_2" header="false" y="1630" x="3518" text-anchor="start" font-size="360" font-family="Times New
Roman" fill="rgb(0,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCell33">
    <text id="cell33_r_3_c_1" header="true" y="2241" x="137" text-anchor="start" font-size="360" font-family="Verdana"
fill="rgb(0,0,0)" font-weight="bold" font-style="normal" text-decoration="none" class="TableCell33">
    <text id="cell33_r_3_c_2" header="false" y="2241" x="3571" text-anchor="start" font-size="360" font-family="Verdana"
fill="rgb(0,0,0)" font-weight="normal" font-style="normal" text-decoration="none" class="TableCell33">CAST</text>
    </text>
    </table>
</report>
<units>
    <trackId_value unitName="m" unitFactor="1" roundDepth="3" confidence="1"/>
    <reference_value unitName="m" unitFactor="1" roundDepth="3" confidence="1"/>
    <velId_value unitName="m/s" unitFactor="1" roundDepth="3" confidence="1"/>
    <accId_value unitName="m/s^2" unitFactor="1" roundDepth="3" confidence="1"/>
    <angle_value unitName="deg" unitFactor="1" roundDepth="2" confidence="1"/>
    <angvelId_value unitName="deg/s" unitFactor="1" roundDepth="2" confidence="1"/>
    <angaccId_value unitName="deg/s^2" unitFactor="1" roundDepth="2" confidence="1"/>
    <scalar_value unitName="%" unitFactor="100" roundDepth="3" confidence="1"/>
    <forceId_value unitName="N" unitFactor="1" roundDepth="3" confidence="1"/>
    <torqueId_value unitName="N*m" unitFactor="1" roundDepth="3" confidence="1"/>
    <work_value unitName="J" unitFactor="1" roundDepth="3" confidence="1"/>
    <power_value unitName="W" unitFactor="1" roundDepth="3" confidence="1"/>
    <emg_value unitName="uV" unitFactor="1000000" roundDepth="3" confidence="1"/>
    <time_value unitName="s" unitFactor="1" roundDepth="3" confidence="1"/>
    <freq_value unitName="/min" unitFactor="60" roundDepth="3" confidence="1"/>
    <mass_value unitName="kg" unitFactor="1" roundDepth="3" confidence="1"/>
    <minert_value unitName="Kg*m^2" unitFactor="1" roundDepth="6" confidence="1"/>
    <volume_value unitName="m^3" unitFactor="1" roundDepth="3" confidence="1"/>
    <density_value unitName="kg/m^3" unitFactor="1" roundDepth="3" confidence="1"/>
    <event_value unitName="s" unitFactor="1" roundDepth="3" confidence="1"/>
</units>
<models>
    <stick_model sequence="asis-r" nLinks="33">
    <link label1="1Rfoot" label2="2Rfoot"/>
    <link label1="2Rfoot" label2="3Rfoot"/>
    <link label1="3Rfoot" label2="4Rfoot"/>
    <link label1="4Rfoot" label2="1Rfoot"/>
    <link label1="1Rtibia" label2="2Rtibia"/>

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<link label1="3Lfemur" label2="4Lfemur"/>
<link label1="1Lfemur" label2="4Lfemur"/>
<link label1="1Ltibia" label2="2Ltibia"/>
<link label1="2Ltibia" label2="3Ltibia"/>
<link label1="3Ltibia" label2="4Ltibia"/>
<link label1="4Ltibia" label2="1Ltibia"/>
<link label1="1Lfoot" label2="2Lfoot"/>
<link label1="2Lfoot" label2="3Lfoot"/>
<link label1="3Lfoot" label2="4Lfoot"/>
<link label1="4Lfoot" label2="1Lfoot"/>
</stick_model>
</models>
</protocol>
```

APPENDICE B: Bibliografia e riferimenti

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