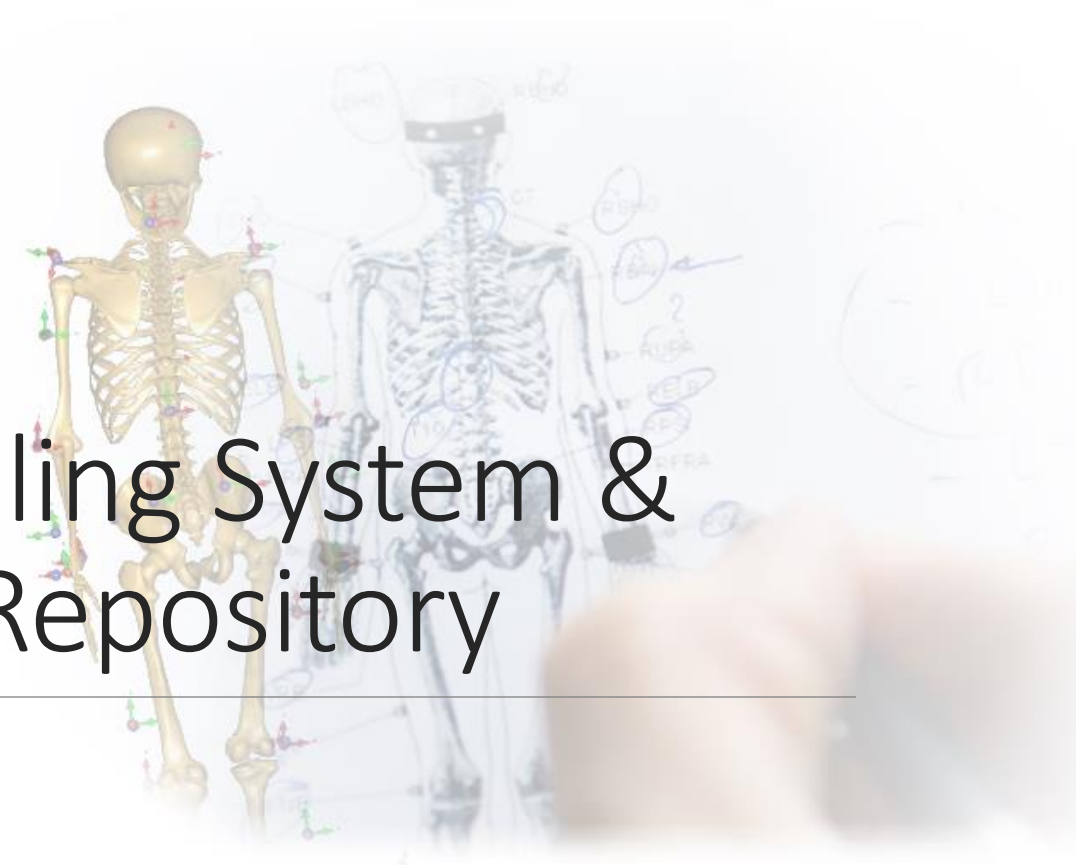


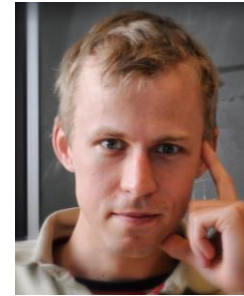
The new AnyBody Modeling System & Musculoskeletal Model Repository

TOUR AND OVERVIEW OF THE NEW 7.1 VERSION



Outline

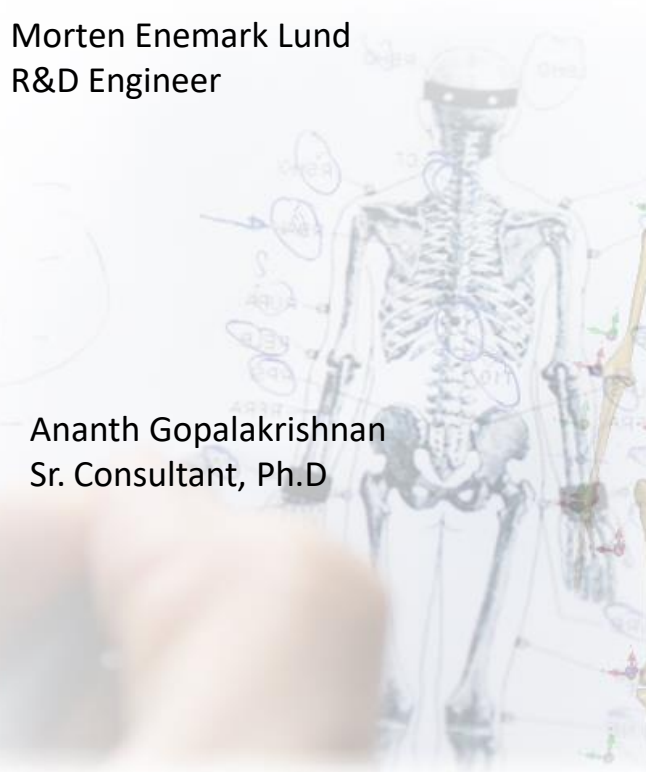
- General introduction to the modeling system
- New features in the Modeling System
- New help resources and documentation
- New Model Repository (AMMR 2.0)
- Questions and answers



Morten Enemark Lund
R&D Engineer

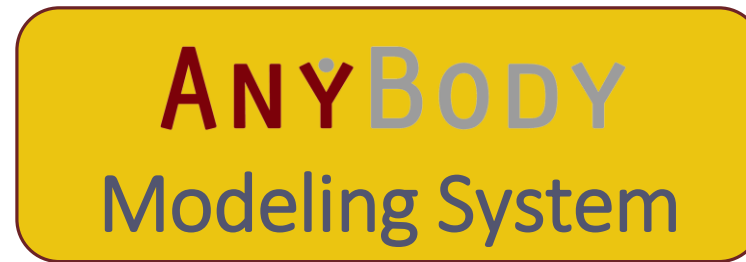


Ananth Gopalakrishnan
Sr. Consultant, Ph.D



Musculoskeletal Simulation

Motion data
Kinematics + Forces

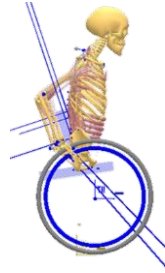


Body Loads

- Joint moments
- Muscle forces
- Joint reaction forces



Movement
Analysis

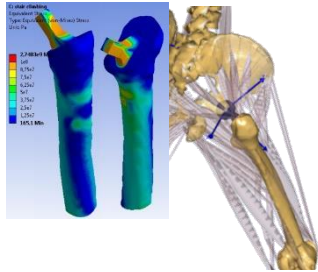


Product Design
Optimization



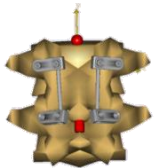
Ergonomic
Analysis

ANYBODY
Modeling System

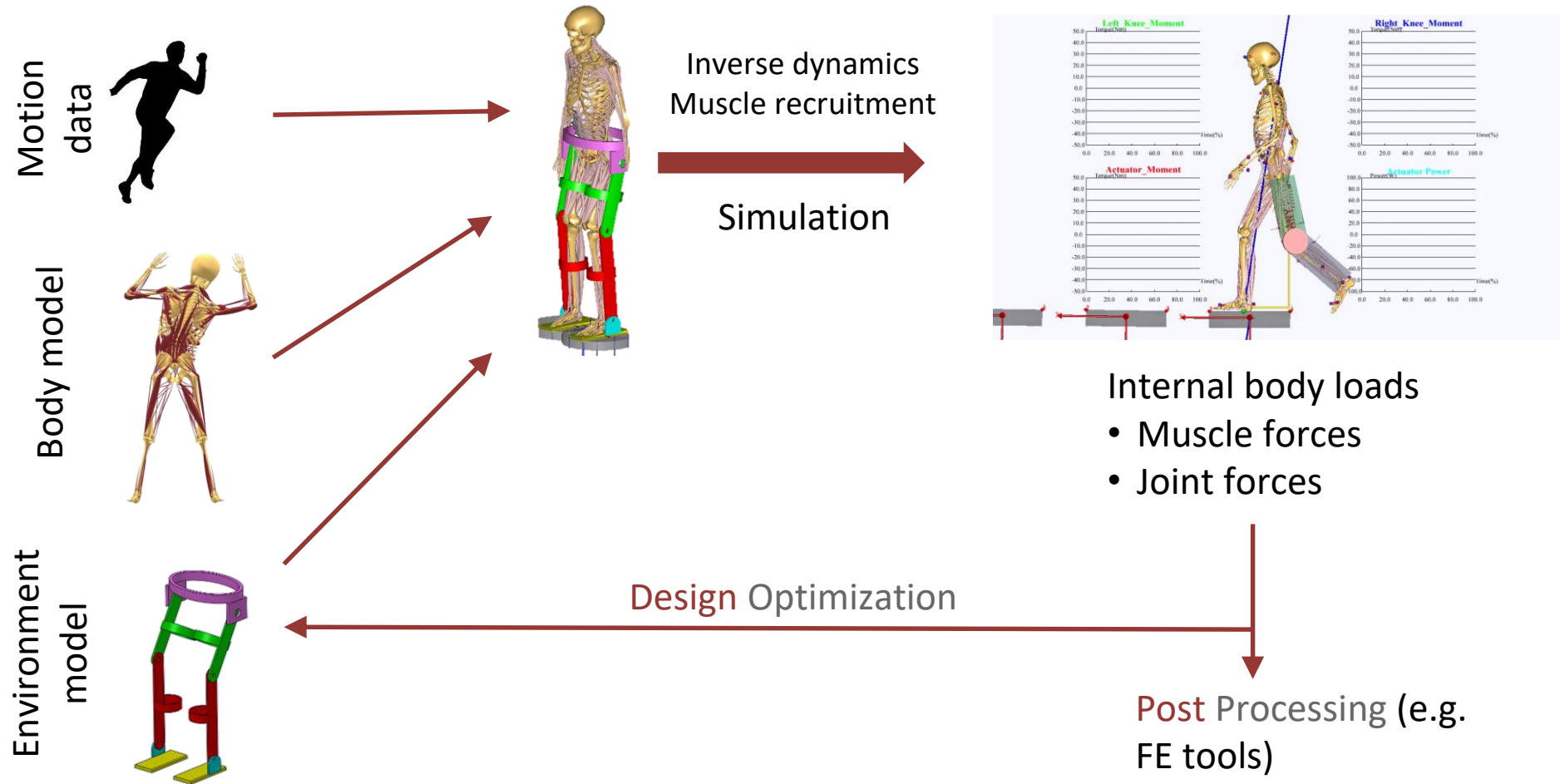


Load Cases for
Finite Element
Analysis

Surgical Planning and
Outcome Evaluation

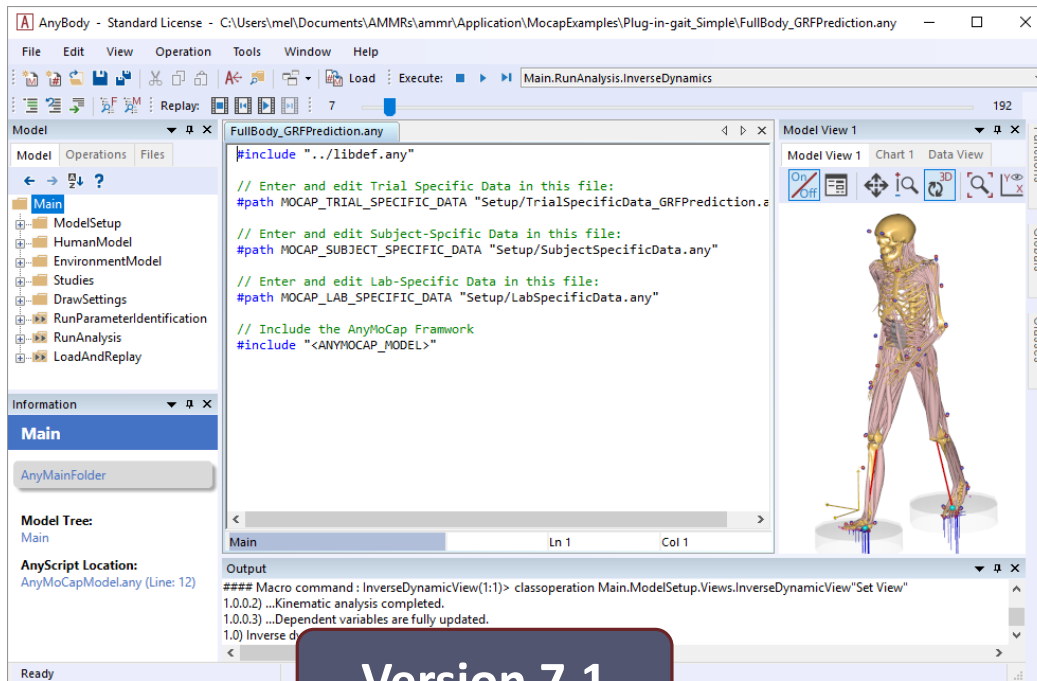


AnyBody Modeling System



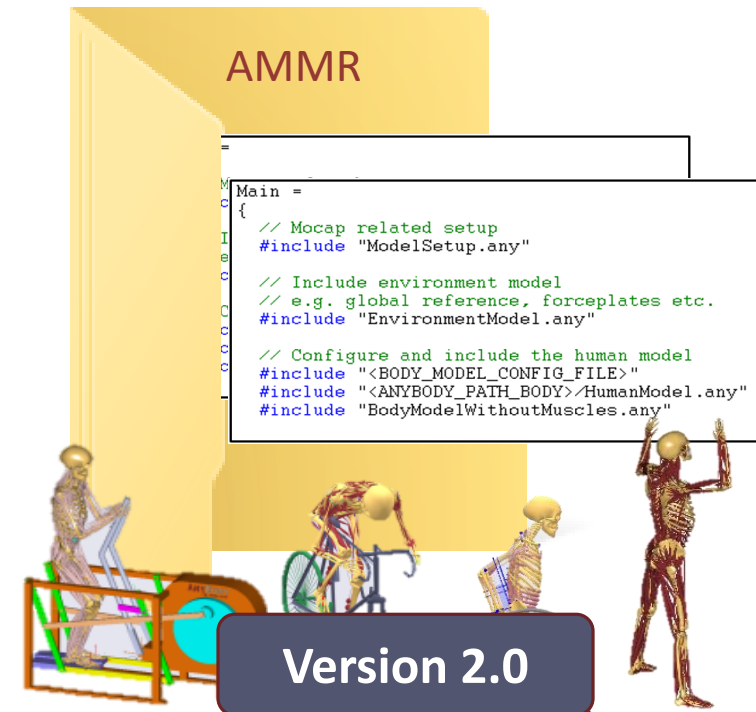
AnyBody Modeling System

ANYBODY Modeling System



Version 7.1

Model Repository



Version 2.0

How to get the new version?

anybodytech.com: Custo x

Sikker | https://www.anybodytech.com/downloads/customer-downloads/?no_cache=1

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AnyBody Modeling System

Download installers for the AnyBody Modeling System here.

AnyBody Modeling System (64-bit version)	v. 7.1.0.5957	2017.11.30	479M	Download Download mirror (faster outside Europe) Install Guide
Note: Organizations with floating licenses must run V12 or higher of the RLM license server (available below).				
AnyBody Modeling System (32-bit version)	v. 7.1.0.5957	2017.11.30	383M	Download Install Guide
Note: Organizations with floating licenses must run V12 or higher of the RLM license server (available below).				
https://www.anybodytech.com/download.html?did=anybody.alternate_download				
	0.1.5467	2017.07.06	318M	Download

What is new?

AnyBody Release Notes

Hide Back Print Options

Contents Index Search

- AnyBody Release Notes
- Legal Notice, Trademarks
- AnyBody Release Notes
 - Version ID
 - System requirements
 - New in this version**
- Acknowledgements

New in This Version

AnyBody Modeling System, version 7.1.0, November, 2017.

AnyBody, v.7.1.0

AnyBody, v.7.1.0 provides a number of minor updates and new features. Many of these are supporting the new version of the AnyBody Managed Model Repository, AMMR v.2.0, or updates to the 7.0.x GUI.

AMMR v.2.0 provides many significant improvements of human body model, including the first release of a lower extremity model based on the TLEM2 dataset. It also includes a new motion capture mode referred to as AnyMoCap. Please refer to the release notes of AMMR for further details.



AnyBody - Standard License - C:\Users\me\Documents\AMMR\ammr\Application\MocapExamples\Plug-in-gait_Simple\FullBody_GRFPrediction.any

File Edit View Operation Tools Window Help

Load : Execute: Main.RunAnalysis.InverseDynamics

Model View 1

Model Operations Files #include "../libdef.any"

Help

- AnyBody Assistant...
- Tutorials
- AnyScript Reference
- AMMR Documentation
- Online documentation ...
- Demo...
- Check for Updates...
- Registration...
- License Agreement...
- Release Notes**
- About AnyBody...

Model View 1 Chart 1 Data View

Model View 1 On/Off 3D Y X

Ln 1 Col 1

d: InverseDynamicView(1:1)> classoperation Main.ModelSetup.Views.InverseDynamicView"Set View" analysis completed. variables are fully updated. analysis...

New in the Modeling System...

- 7.1 -> No major changes
- Many smaller bug fixes and improvements..
- Many tweaks to the user interface.
- Updates to muscle models
 - New/renamed members in `AnyMuscleModel`
 - Volume (Vol0) is now always present.
 - Some variables renamed (e.g. `Lfbar` to `Lf0`)
- New system for collecting mechanical objects in studies.

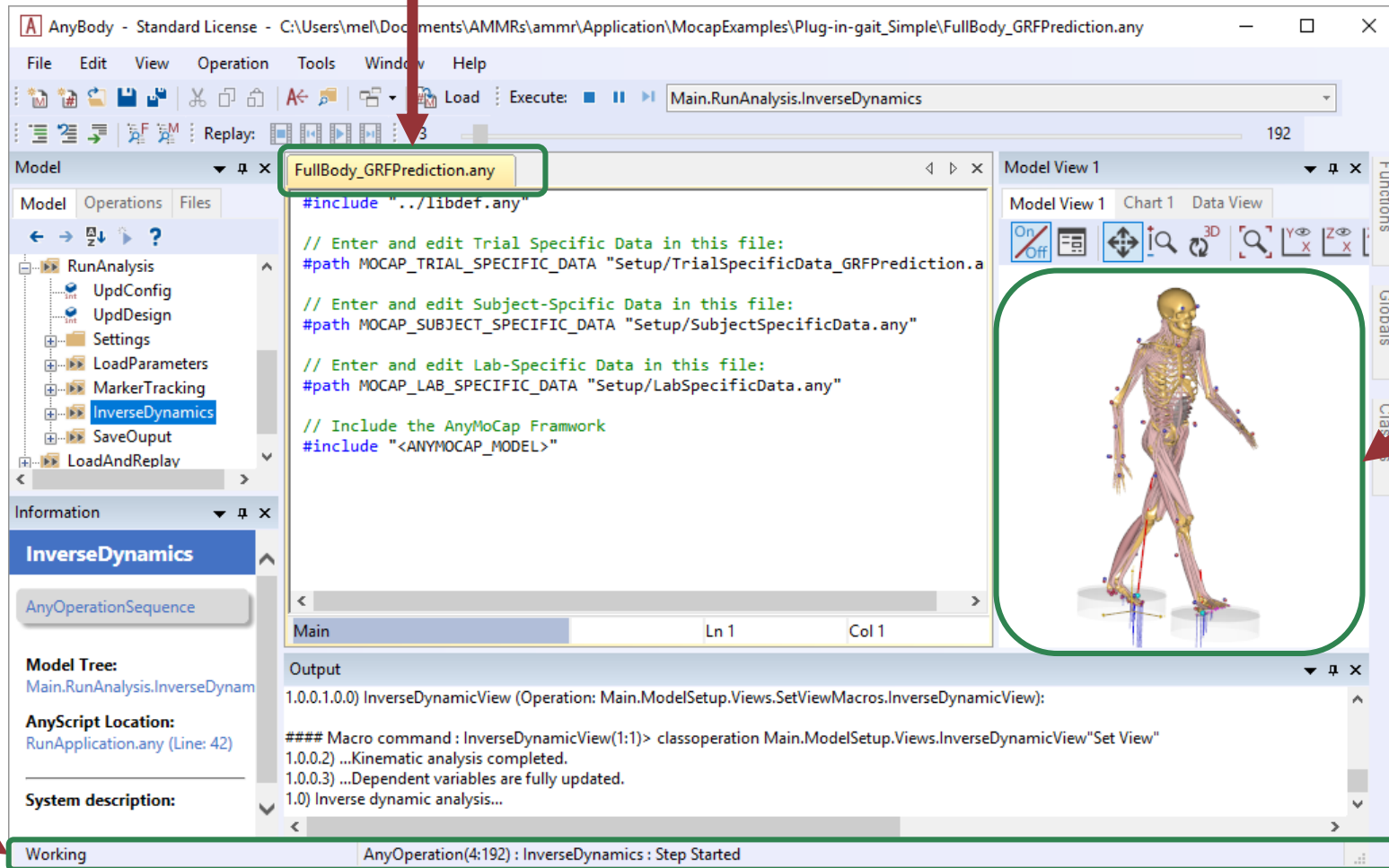
Preparation for future releases

- No influence on backwards compatibility
- May give warnings/notice when loading old models

WARNING(SYS4) : C:/U..s/mel/D..s/A..s/a..d/Body/A..n/L..M/MusPar.any(4058) : SoleusMedialis1Par.Lfbar : Deprecated Object/Member Lfbar, Gammabar, and Espilonbar are deprecated objects. It is recommended to use Lf0, Gamma0, and Epsilon0, respectively.

UI updates and tweaks

Improved logic for editor tabs



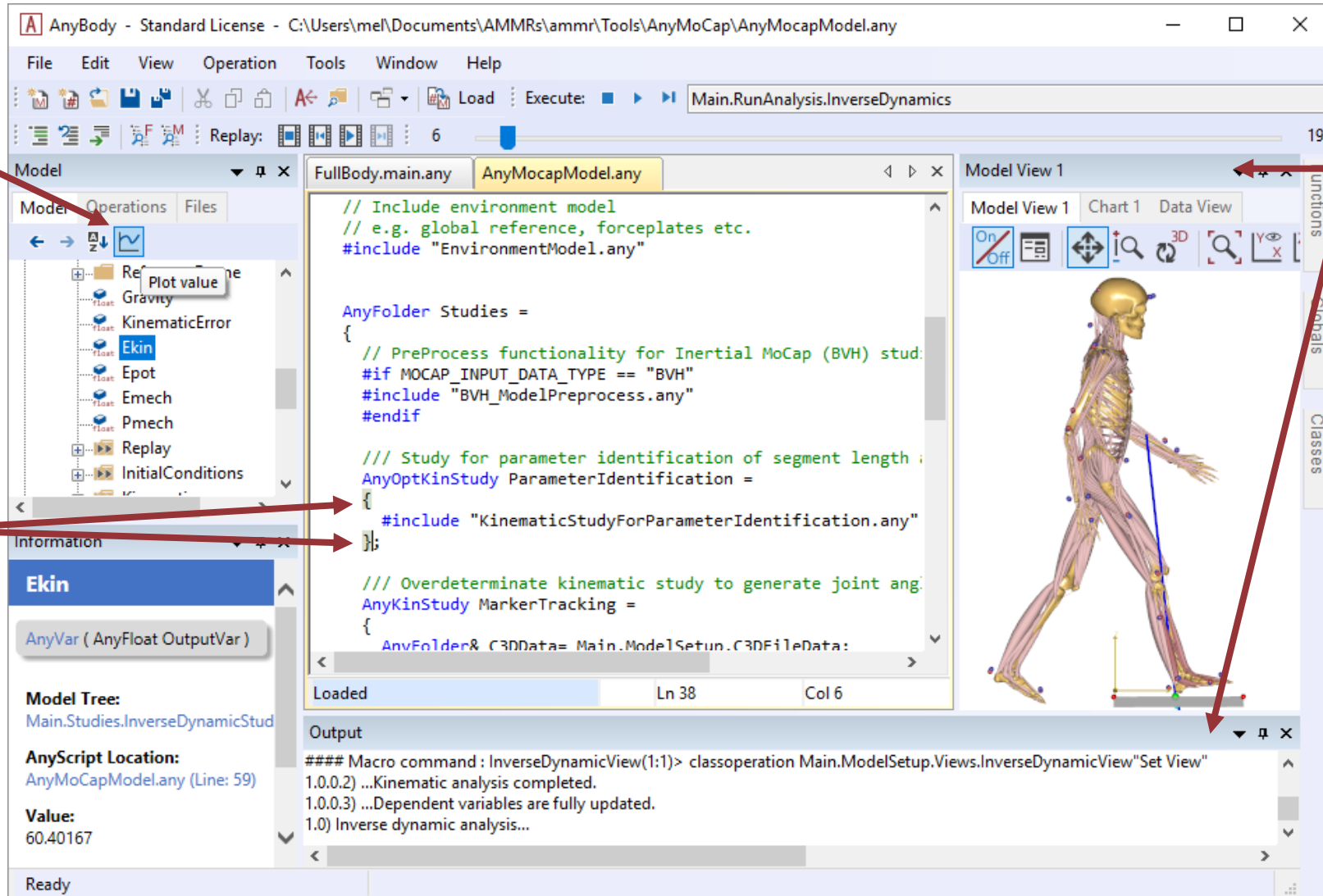
New status bar

Faster graphics
in model view.

UI updates and tweaks

New button for plotting variables directly from the model tree

Highlight matching braces



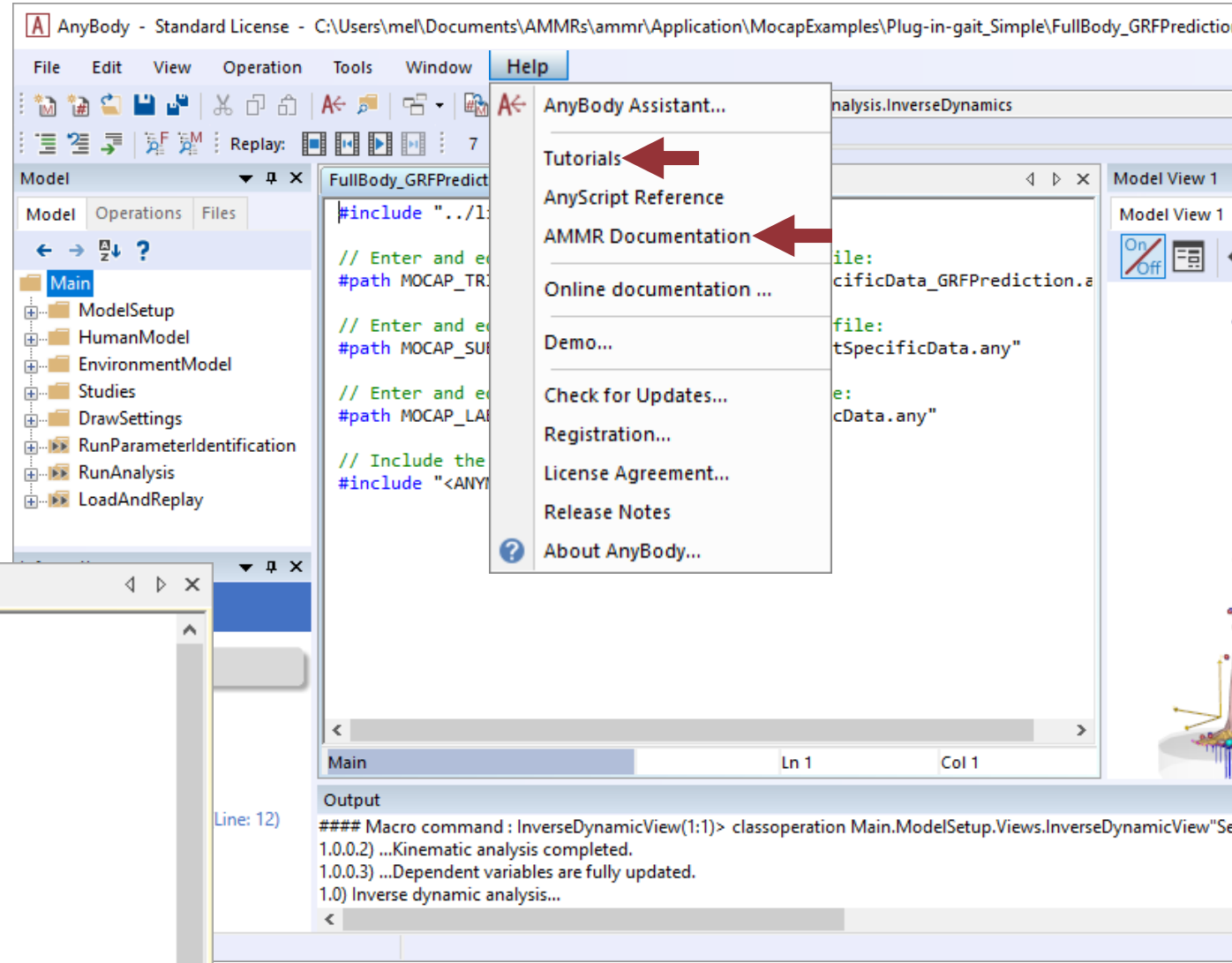
Windows can no longer undock by dragging

Instead: Double-click or right-click and choose undock

New help resources

- Updated AnyBody Tutorials
- New Model Repository Documentation

Double-click html links to open documentation directly...



```
BodyModelConfig.any *
// -----
// Model configuration:
// For more info on body model configuration options.
// Please load the model and double click on:
// #path HTML_DOC "<AMMR_PATH_DOC>/bm_config/index.html"
// -----
Main = {

#define BM_SCALING_SCALING_LENGTHMASSFAT_
#define BM_MANNEQUIN_DRIVER_DEFAULT OFF

#ifdef BM_LEG_MODEL
#define BM_LEG_MODEL_LEG_MODEL_TLEM2_
#endif

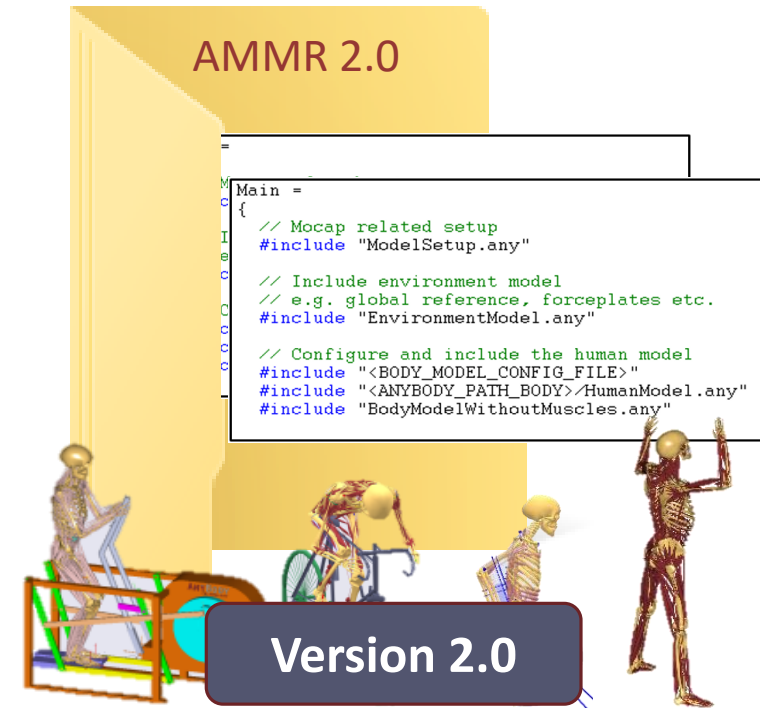
#if INCLUDE_UPPERBODY == ON
```

New Model Repository

Major release: version 1.6 -> **2.0**

- Many improvements and changes.
- New Lower Extremity Model
- New Mandible Model
- New framework for MoCap based models
- New and updated examples

Model Repository



Repository Changelog

AMMR v2.0.0 Documentation » About the AMMR » [previous](#) [next](#) [toc](#) [index](#)

Changelog

AMMR 2.0.0 (2017-11-29)

Major changes:

New lower extremity model (TLEM2.1)

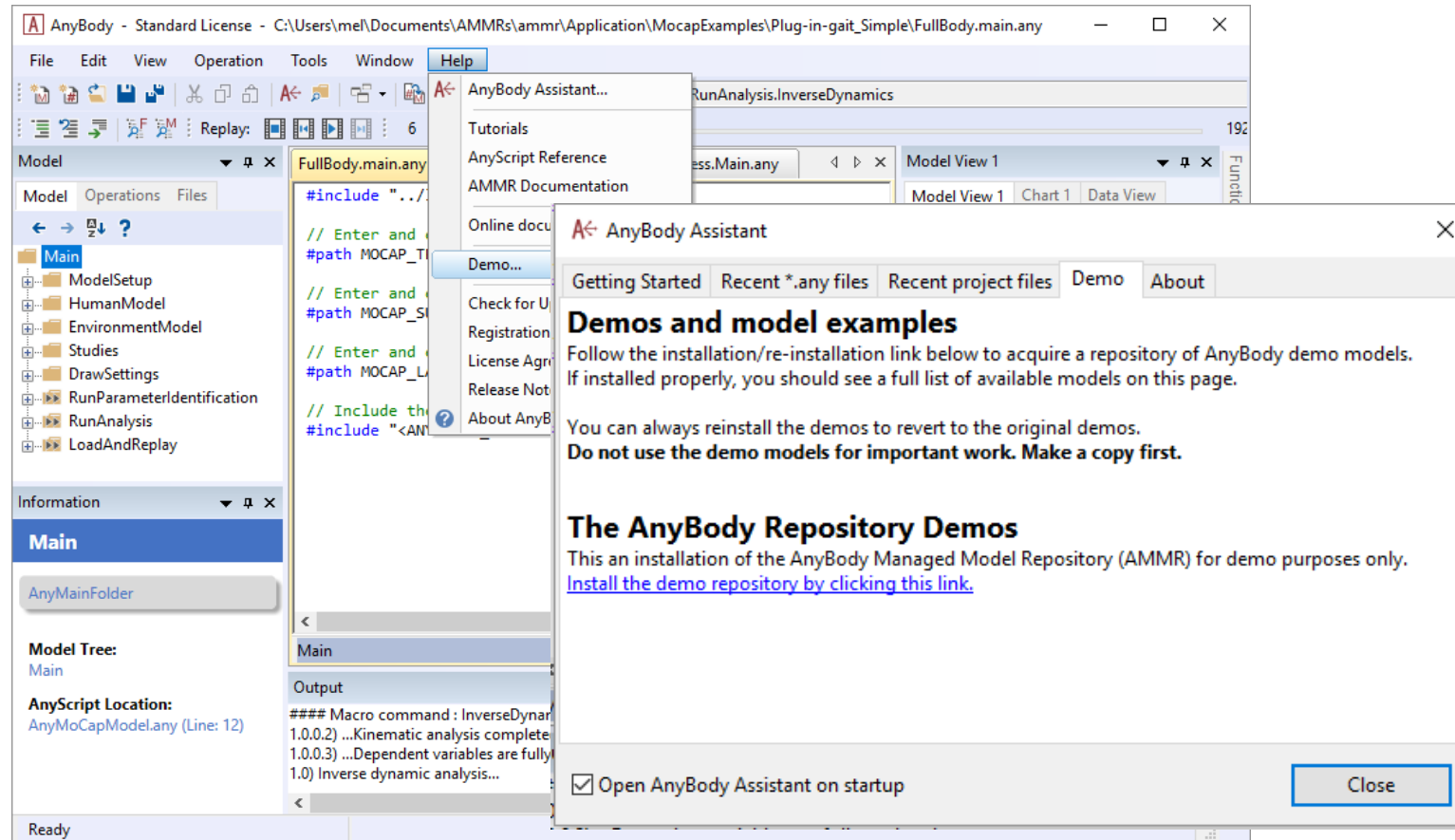
- The Twente Lower Extremity Model version 2.0 dataset, developed in the TLEMSafe EU project was implemented in the AMMR repository. The model is not the default model, but can be enabled with the BM parameter `#define BM_LEG_MODEL _LEG_MODEL_TLEM2_`
- The model is versioned TLEM 2.1, to indicate the number of changes and correction which has been added in the process. The changes and updates to the TLEM2 dataset was done in the Life Long Joints EU research project (paper submitted for publication).
- The most important changes to the TLEM 2 dataset include the following:
 - Updated wrapping for the Gluteus Maximus, Iliacus, Psoas around the hip

About the AMMR
► *Changelog*

Table Of Contents

- Welcome to the AMMR document
- Getting Started with AMMR
- Configuring the Body Model
- The Body Models
- Application Examples
- Creating a Human model from scan
- Introduction to Scaling
- The AnyMoCap Framework
- About the AMMR
- Changelog
- Contribute to Model Development
- Legal, Trademarks and Copyrights

How do I get the new Model Repository?



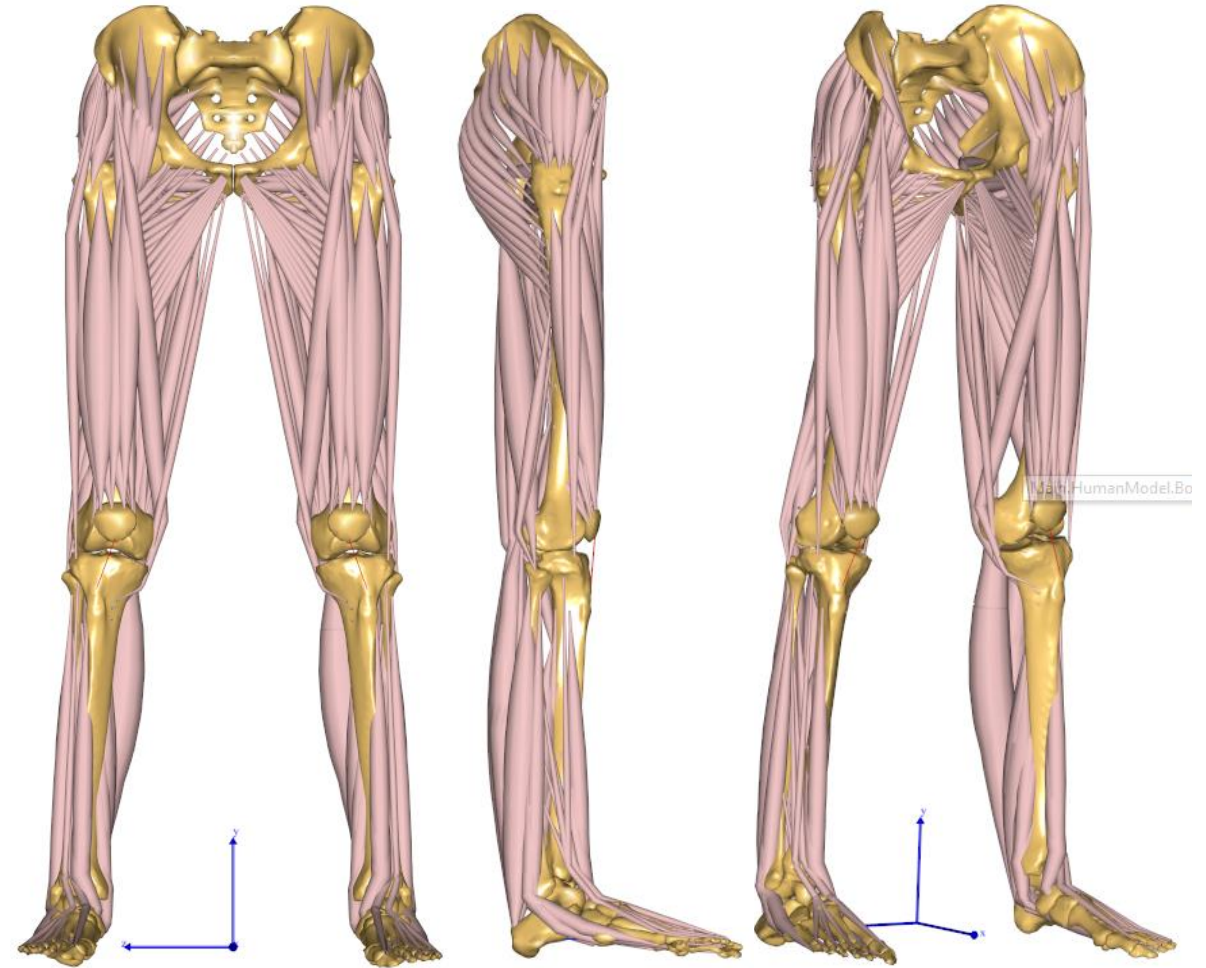
New lower extremity model

- Twente Lower Extremity Model 2.0
 - Dataset from TLEMsafe EU project



TLEMsafe <https://www.tlemsafe.eu/>

- First implementation (TLEM 2) by:
 - Vincenzo Carbone and René Fluit from the University of Twente



Journal of Biomechanics 48 (2015) 734–741

Contents lists available at ScienceDirect

Journal of Biomechanics

journal homepage: www.elsevier.com/locate/jbiomech
www.JBiomech.com

TLEM 2.0 – A comprehensive musculoskeletal geometry dataset for subject-specific modeling of lower extremity

V. Carbone^{a,n,1}, R. Fluit^{a,1}, P. Pellikaan^a, M.M. van der Krogt^{a,b}, D. Janssen^c, M. Damsgaard^d, L. Vigneron^e, T. Feilkas^f, H.F.J.M. Koopman^a, N. Verdonschot^{a,c}

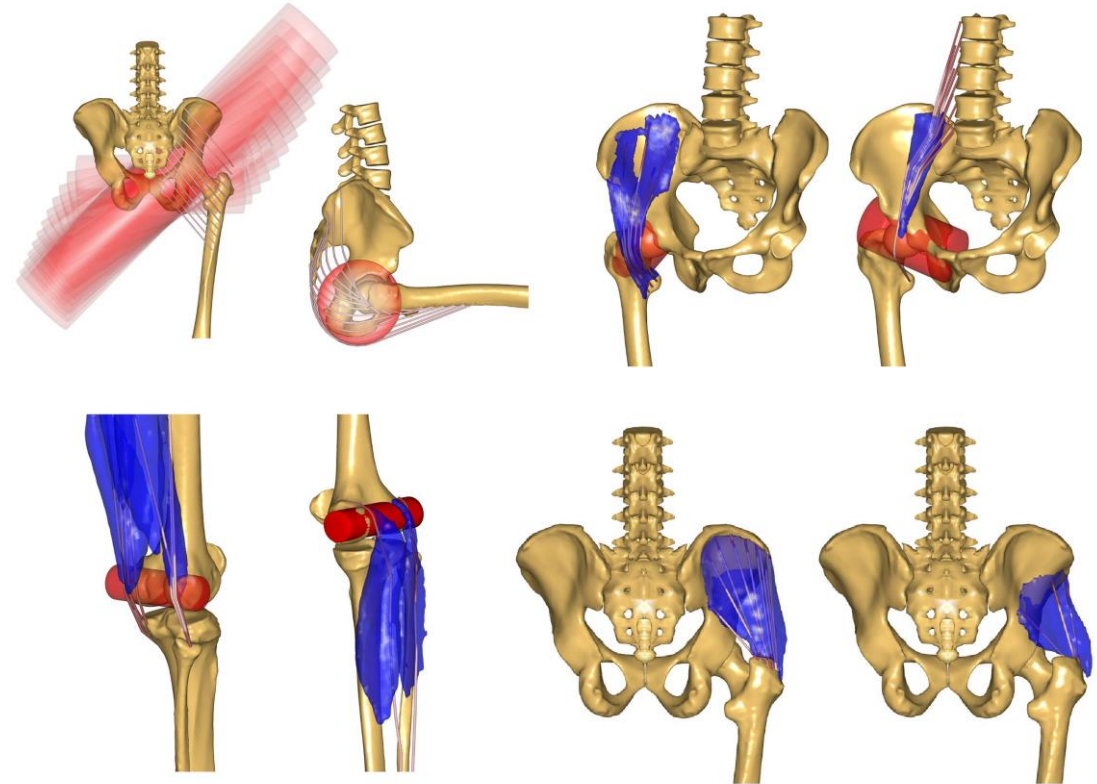
^a Laboratory of Biomechanical Engineering, Faculty of Engineering Technology, MIRA Institute, University of Twente, Enschede, The Netherlands
^b Department of Rehabilitation Medicine, Research Institute MOVE, VU University Medical Center, Amsterdam, The Netherlands
^c Orthopaedic Research Laboratory, Radboud University Medical Centre, Nijmegen, The Netherlands
^d AnyBody Technology A/S, Aalborg, Denmark
^e Materialise N.V., Leuven, Belgium
^f Brainlab AG, Munich, Germany

New lower extremity model

- Released version TLEM 2.1
 - Updated implementation
 - Re-engineered wrapping surfaces from MRI scans
 - Joint axis fitted from bone geometry
 - Many small bugfixes and improvements
- Work was done in the *Life Long Joint* EU project by: Enrico De Pieri, ETH Zurich. *
- Not the default model. Activate by setting:

```
#define BM_LEG_MODEL _LEG_MODEL_TLEM2_
```

[See more in the AMMR documentation](#)



* De Pieri, E., Lund, M. E., Gopalakrishnan, A., Rasmussen, K. P., Lunn, D. E., and Ferguson, S. J., 2017, "Biofidelic Muscle Wrapping in a Musculoskeletal Model Improves Hip Contact Force Prediction Accuracy," PlosOne. (Submitted)

New Mandible Model

Mandible model based on a CT scan of a 40 year old male.

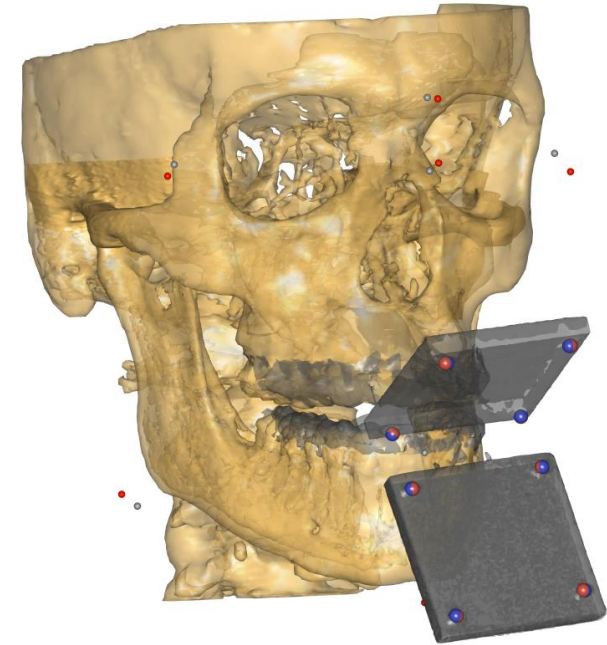
Created by:
Michael Skipper Andersen and **Mark de Zee**.
Aalborg University, Denmark.

Validation example:

[Application/Validation/AalborgMandibleValidation/](#)

Published in:

Andersen MS, de Zee M, Damsgaard M, Nolte D, Rasmussen J. 2017. *Introduction to Force-dependent Kinematics: Theory and Application to Mandible Modeling*. Journal of Biomechanical Engineering, 139(9), 091001. DOI: 10.1115/1.4037100.

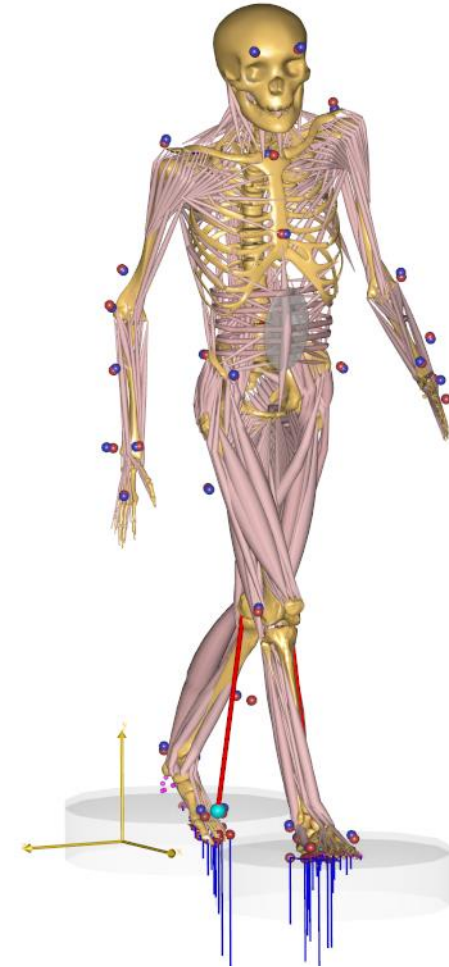
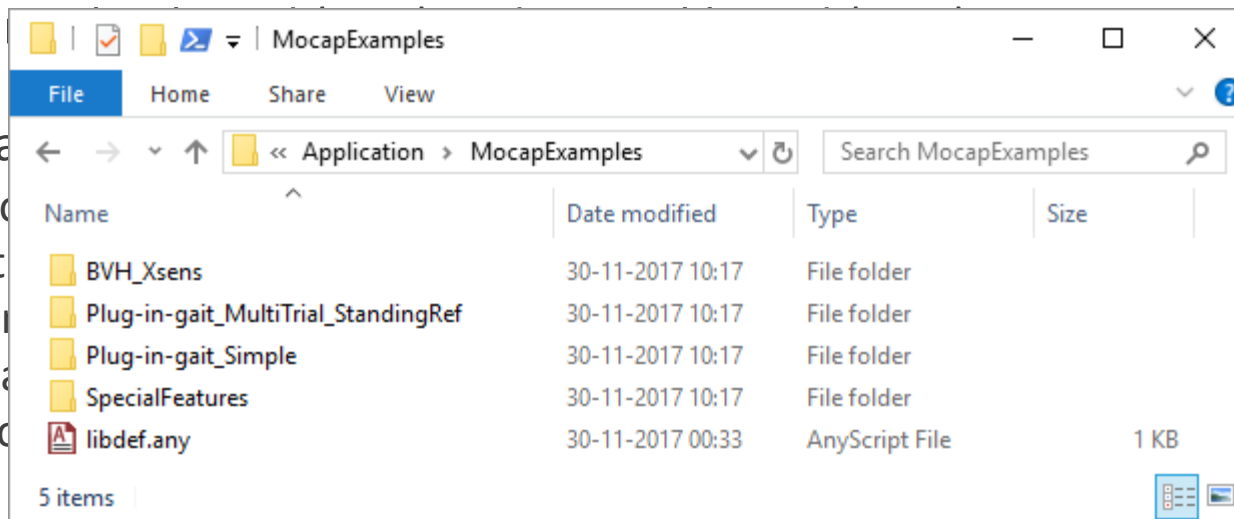


The work was supported by the Sapere Aude program of the Danish Council for Independent Research under grant number: DFF-4184-00018.

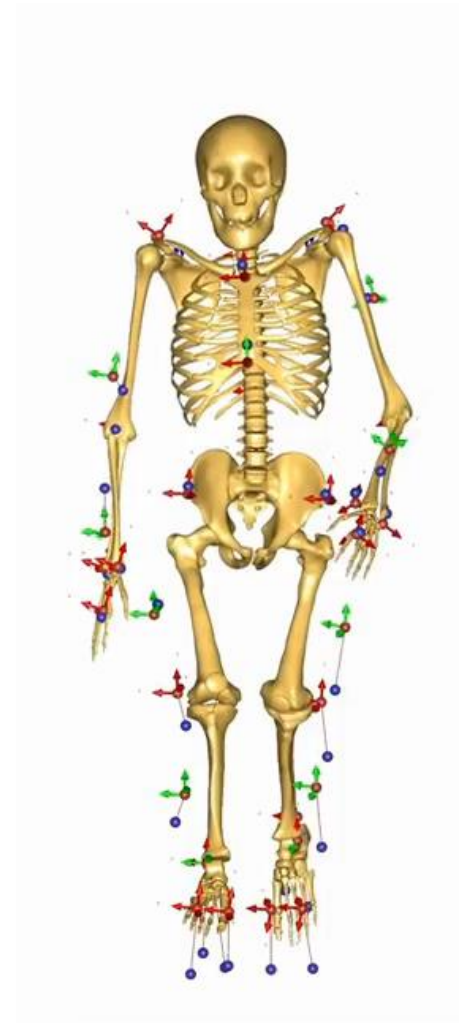
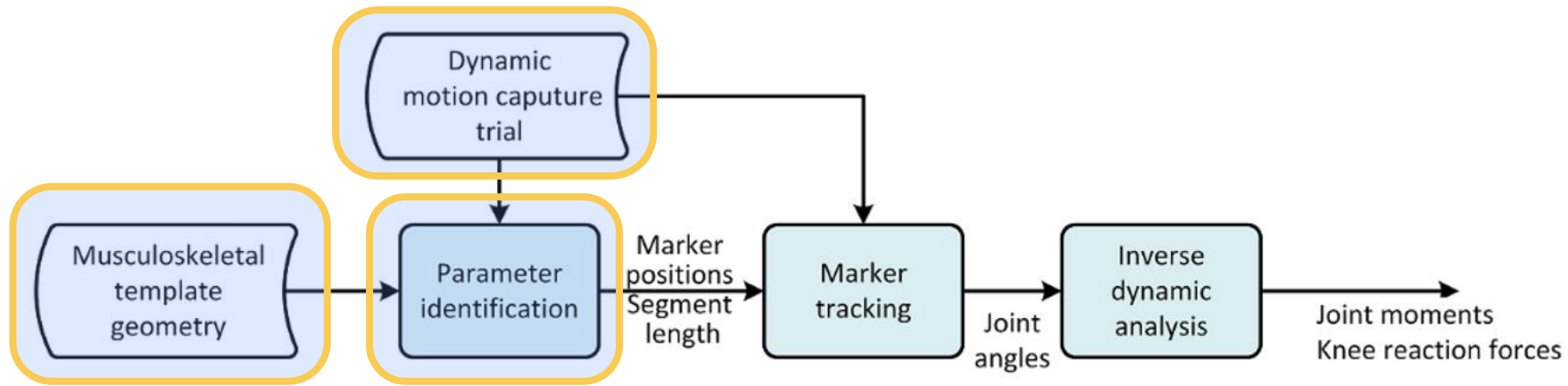
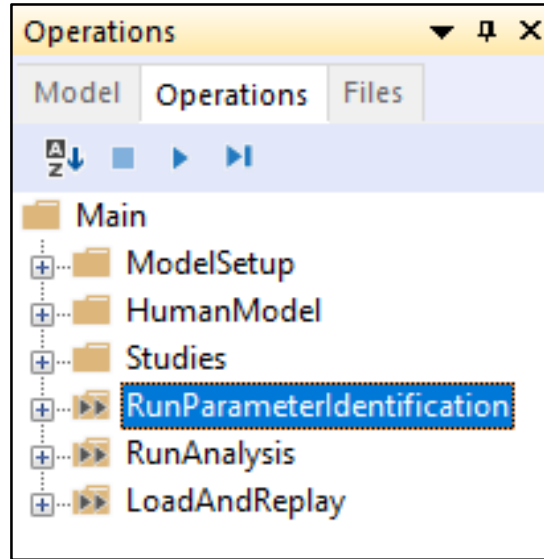
New Framework for MoCap models

Replaces the old MoCap examples

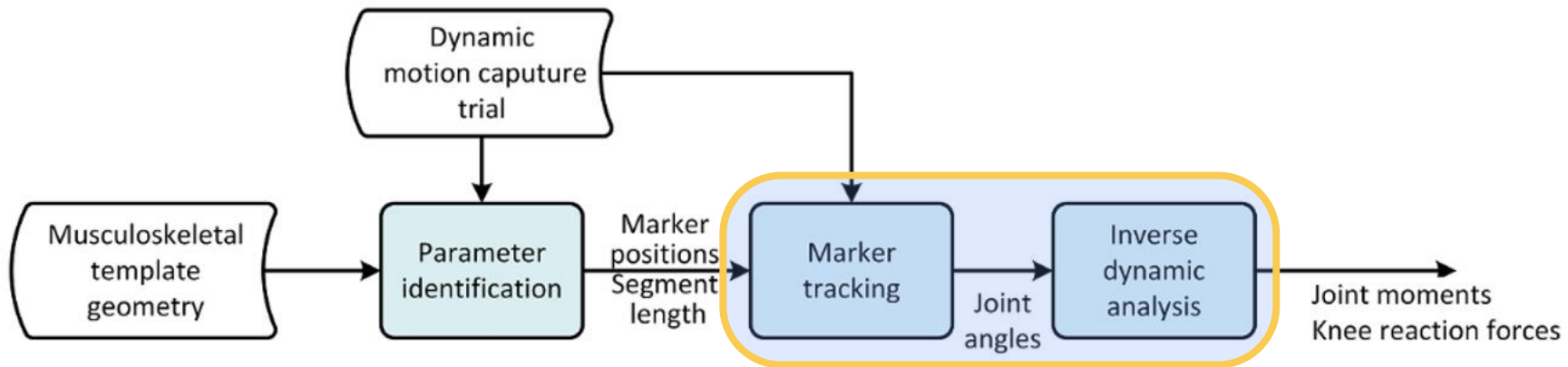
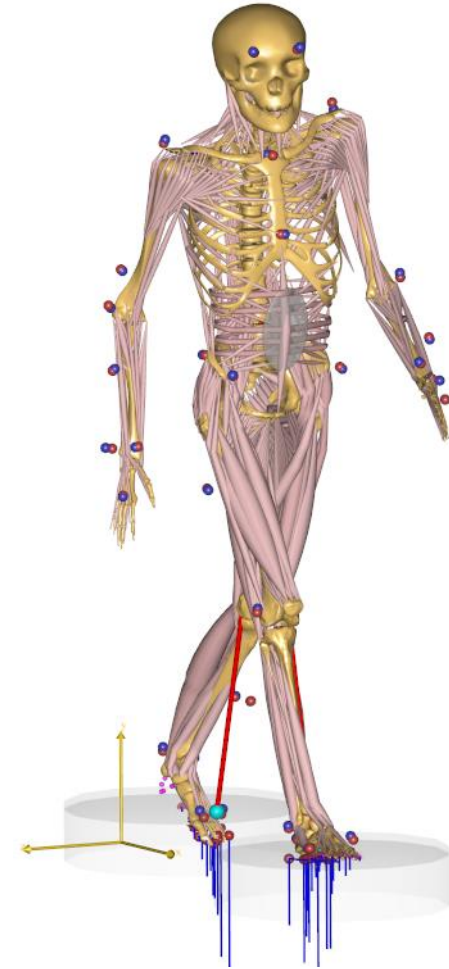
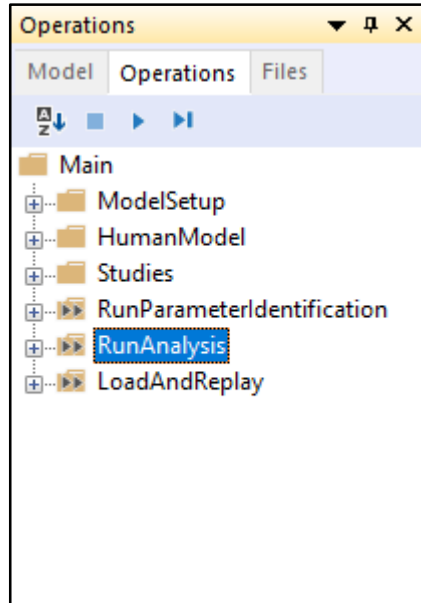
- Easy MoCap setup
- Support
- Many features
 - Prediction
 - Easy setup
 - Handle
 - Filter
 - Offset
- Plus much more. [See the documentation.](#)



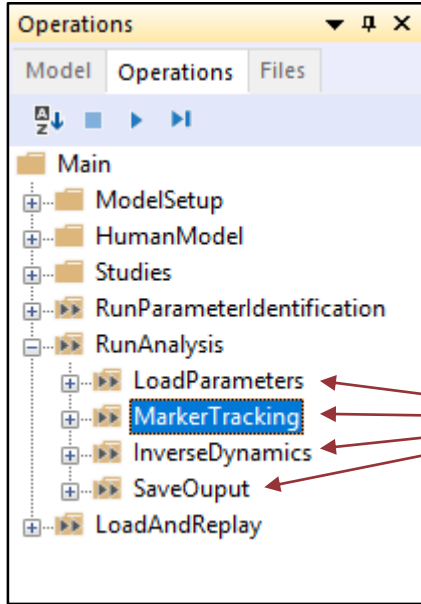
New Framework for MoCap models



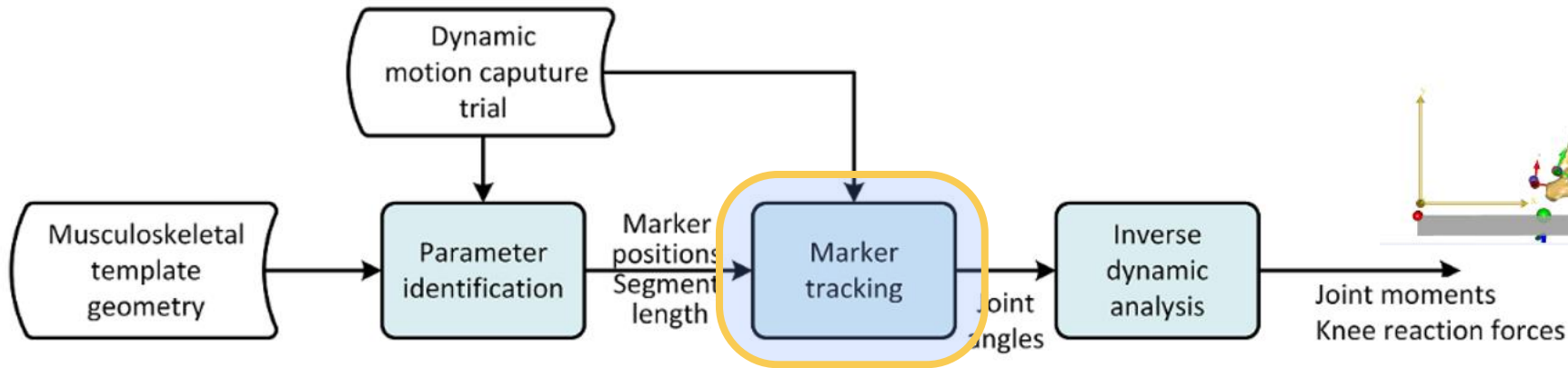
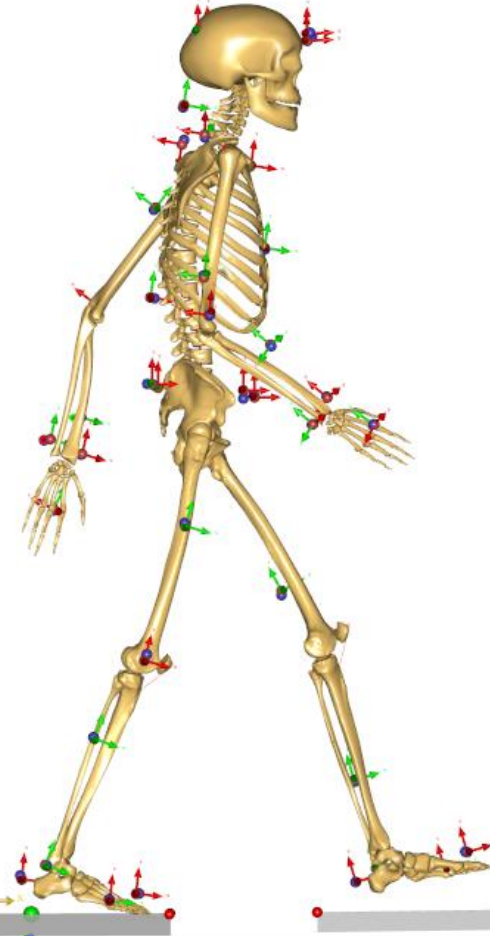
New Framework for MoCap models



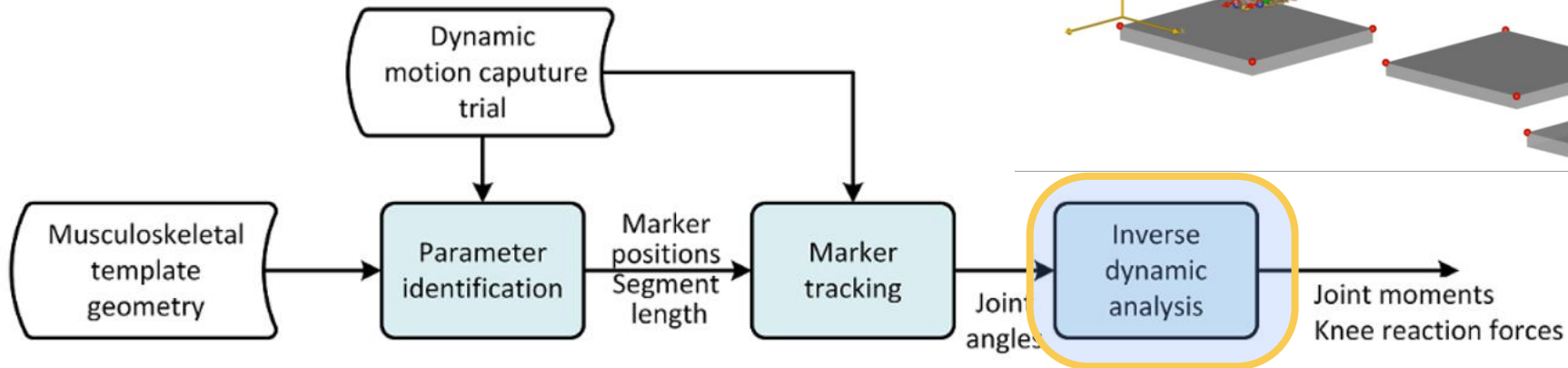
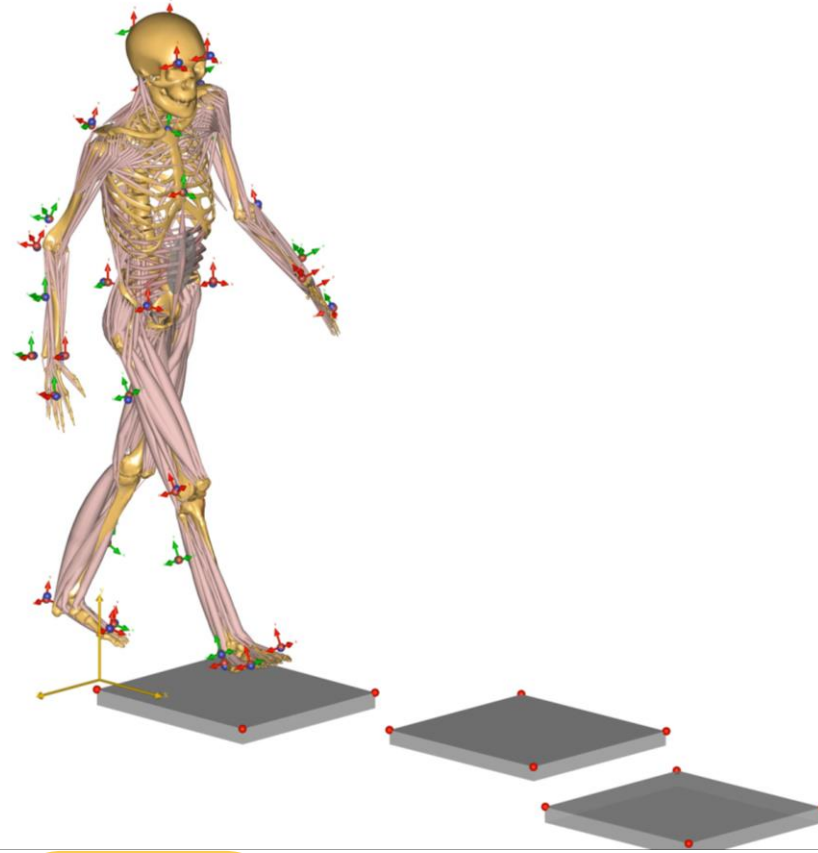
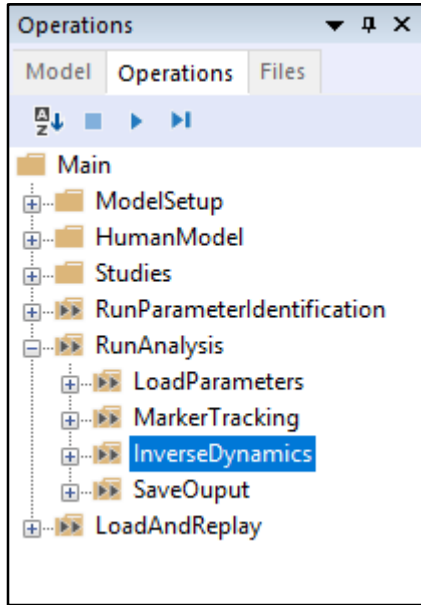
New Framework for MoCap models



RunAnalysis is split into several steps



New Framework for MoCap models

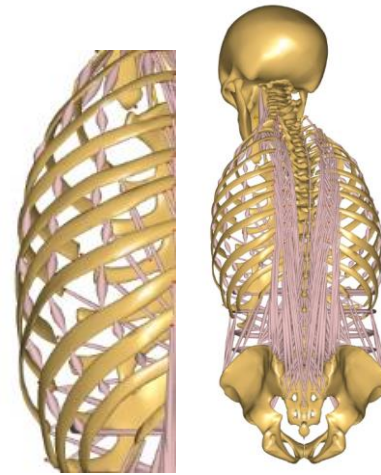


Future repository development...

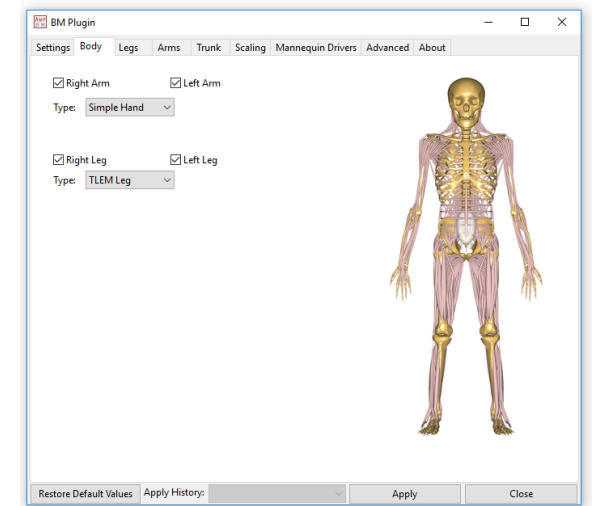
Spring 2018 release:

- **Graphical model editing**
 - Plugin for system (Using Python)

- **New Thoracic model**



New thoracic model



BM configurator plugin

- **Volume based muscle recruitment**

Previous webcasts

- Check our YouTube channel

www.anybodytech.com

- Events, dates, publication list, ...


www.anyscript.org

- Wiki, Forum, Repositories

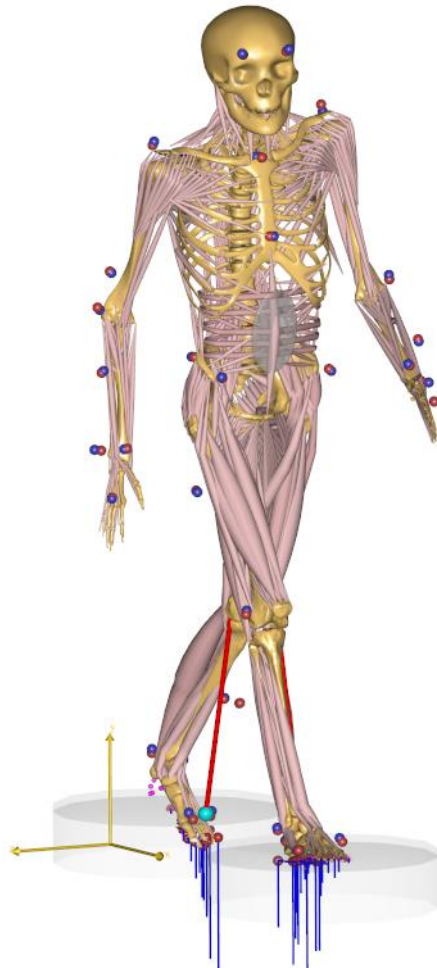


The screenshot shows the AnyBody Technology website's 'Publications' page. The page features a navigation menu with links for 'INDUSTRIES', 'SOFTWARE', 'SERVICES', 'EVENTS', 'DOWNLOADS', and 'CONTACT'. Below the navigation, there are filters for 'Industry' (orthopedics, automotive, exoskeleton, aerospace, defense, work place ergonomics, consumer products, furniture, sports) and 'Body part' (hand, wrist, upper extremity, shoulder, trunk, spine, hip, lower extremity, knee, ankle, foot, mandible, elbow, leg). The 'Research area' filter includes seating, gait, methods, FEA, animal, occupational health, validation, sensitivity analysis, and rehab. The main content area displays a list of publications with the following details:

Year	Publications	Keywords
2018	Chander DS, Cavatorta MP (2018), "Multi-directional one-handed strength assessments using AnyBody Modeling Systems", Appl. Ergon., vol. 67, pp. 225-236. [DOI, WWW]	NEW upper extremity validation
2017	Angelini L, Damm P, Zander T, Arshad R, Di Puccio F, Schmidt H (2017), "Effect of arm swinging on lumbar spine and hip joint forces", J. Biomech.. [DOI]	spine hip knee gait
2017	Arshad R, Angelini L, Zander T, Di Puccio F, El-Rich M, Schmidt H (2017), "Spinal loads and	spine gait

 **Meet us?** Send email to sales@anybodytech.com

Time for questions:



Welcome to the AMMR v2.0.0 Documentation

previous next toc index

«

Welcome to the AMMR documentation!

The AnyBody Model Repository (AMMR), is an open library of musculoskeletal models and examples ready to be used with the AnyBody Modelling System.

Quick search

Go

Table Of Contents

- Welcome to the AMMR documentation
- Getting Started with AMMR
- Configuring the Body Model
- The Body Models
- Application Examples
- Creating a Human model from scan
- Introduction to Scaling
- The AnyMoCap Framework
- About the AMMR

This Page

Show Source

The AnyBody Model Repository is a unique open collection of human body parts.