



Release Notes - Pipeline - 0.7.0

Summary	1
Progression.....	1
Planified	1
Milestone objectives	2
Changelog.....	2
Pipeline.....	2
Hub.....	3
Plugins	3
How-to use new features?	4
General.....	4
Cycle alignment display.....	4

SUMMARY

List of tasks completed in this milestone and information on how to use the features.

PROGRESSION

Completed tasks

- **Statistical computation**
 - Implementation of the plugin to normalize along the time Arnaud Barré
 - Integration of the statistics in the Matlab code Arnaud Barré

Tasks in progress

- **Statistical computation**
 - Implementation of the plugin to compute descriptive statistics Arnaud Barré
 - Outcome computation (GGI, GPS, GDI, spatiotemporal parameters) Arnaud Barré

Tasks in progress (on hold)

- **Force plate assignation**
 - Associate semi-automatically a force plate with a foot.
- **History (testing)**
 - Main operation, first level.
 - Detailed operation creation / copy / write data.
- **Analysis viewer**
 - Allow to display the content of the analysis and the different level.
 - Display data and meta data associate to all the level.

Fixes

- Missing time series attributes (i.e. SampleRate, StartTime) in generated datasets.

PLANIFIED

Next tasks

- **Statistical computation**
 - Event detection
- **Batch processing**
- **Exportation**
 - C3D

Known issues

- Filenames containing accented characters in the path generates a Matlab error indicating an invalid path
- Butterworth filters are not suitable when there is only one sample and will generate NaN data.
- Wrong way to use custom HJC attributes. The calibration of the CGM 1.x model has to include them instead.
- Custom computation of the centre of mass for the torso segment (quick fix).
- The cycle alignment does not generate information about the time axis (the normalization can be different than 101 points between 0 and 100% of a gait cycle).

MILESTONE OBJECTIVES

- The deliverable includes a demo script to use all the features. The main goal is to use real datasets with the demo script to see both the usage of the scripts and the results generated.
 - Test the exposed functionalities for the reading of C3D files.
 - Use Butterworth filters and fill gaps.
 - Test the exposed functionalities for the configuration and calibration of the model.
 - Test the exposed functionalities to reconstruct segments' poses.
 - Test the exposed functionalities to estimates joint kinematics.
 - Test the exposed functionalities to compute body segments inertial parameters (BSiP).
 - Test the exposed functionalities to compute joint kinetics.
 - Test the exposed functionalities to compute cycle alignments.
- We are expecting feedback on missing features and comments on usability. Comments on user habits are essential to guarantee their adherence to the solution.

CHANGELOG

Compared to the version 0.6.0, the following elements were integrated:

PIPELINE

Added

- New Matlab function `plot_kinematics_cycles_lowerlimb`.
- The Matlab function `compute_cgm11` includes the required steps to align cycles.
 - Events extraction from C3D file
 - Cycles indexation (Left and Right context)
 - Parameters preparation (Left and Right context)
 - Linear length normalization

Changed

- The Matlab function `compute_cgm11` accepts the settings of the inter ASIS distance.

Fixed

- Quick fix for the computation of the centre of mass for the torso

HUB**Added**

- Matlab: new function `moveck.data_set.shape`.
- Matlab: new function `moveck.data_attribute.shape`.

Changed

- The function `moveck.display_analysis` is disabled for the moment in the bindings (Matlab, Python).

PLUGINS**Added**

- Callable `cgm1x.reconstruction` sets time series attributes (i.e. `SampleRate`, `StartTime`, `NumSamples`) to the model.
- Callable `cgm1x.reconstruction` uses a new way to propagate time series attributes (i.e. `SampleRate` and `StartTime`) instead of manually setting `SampleRate` only.
- Callable `cgm1x.joint-angles` sets time series attributes (i.e. `SampleRate` and `StartTime`) to each computed angle.
- Callable `cgm1x.progression-angles` sets time series attributes (i.e. `SampleRate` and `StartTime`) to each computed angle.
- Callable `cycle.index_from_events` added.
- Callable `cycle.prepare_parameters` added.
- Callable `cycle.linear_length_normalization` added.

Changed

- Callable `c3d-format.events-detect` computes times based on the shape of the `EVENT:TIMES` parameter. It does not assume a shape (2,USED), but also (USED,2) and (2*USED,1).
- Callable `c3d-format.forceplate-detect` has type-5 implemented and option to convert from imperial to SI units.
- Callable `data-modifier.group-copy` requires the parameter `SourceGroup`.

Fixed

- Callable `classical-mechanics.straight-progression-axis` does not set missing time series attributes (i.e. `SampleRate` and `StartTime`) for the computed set `Progression/T_SCS`.
- Callable `signal.set-butterworth` can have computation errors in case the chosen axis was not the last one.
- Callable `signal.set-fill-gap` can have computation errors in case the chosen axis was not the last one.

HOW-TO USE NEW FEATURES?

GENERAL

Most of the new or updated features were integrated in the `compute_cgm11` Matlab script. The workflow for the processing can be visualized at the end of the document.

CYCLE ALIGNMENT DISPLAY

The Matlab function `plot_kinematics_cycles_lowerlimb` (included the script `demo_cgm11`) creates two figures. One is for the kinematics of the left lower limb. The other is for the kinematics of the right lower limb. The name of the figure (in the title bar) show which side is displayed.

In each figure, there are 3 rows and 3 columns. Each row present a joint (hip, knee, angles), while each column presents a specific angle (F/E, Abd/Add, RI/RE).

This function is a demo to show what it is possible to do.



