1st Nov 2018 – 30th Jul 2019

R&D for Youdome pro sports and health care software

For avatars 3D reconstruction (body scanning) and measurement

- **Achieved tasks :**

  - Point set repositioning, cleaning, and processing (grid simplification, outliers removal)
  - 3D reconstruction (screened Poisson) / mesh generation integration
  - Mesh processing : holes and boundary detection, smoothing, altitude thresholding, hole filling
  - Mesh subselection and substripe selection
  - Isotropic **mesh slicing** algorithm
  - Convex hull option for slices girth
  - Limb girths and diameter curves
  - Avatar **slicing video**
  - Avatar **advanced segmentation and labelling**
  - Landmarks level / altitude detection
  - Avatar stick skeleton
  - Vectorized / oriented slicing
  - Lumbar profile extraction and bending values estimation
  - Input parameters estimation and adjustment
  - Output data formated writing
  - Output data automatic statistics generation and registration for each athlete in its folder
  - Output main resulting images registration for each athlete in its acquistion folder
  - Automatic file name segmentation and file management
  - Fully automatic mode, sequential mode, test mode
  - Data file format conversion (.xyz, .off, .ply, .obj)
  - Parallel processing
  - GPU tests
  - Processes monitoring
  - Code user manual and programer documentation
  - Youdome visual slogan and icon

Programming languages, libraries, versioning tools and OS :

- Matlab
- Meshlab & Meshlab server
- DOS
- Doxygen

- **Collaborations and partnerships**

- Christian Barat, I3S
- Clément Lavallard, Iccus
- Benjamin Guilleray, dynamic audio
- Maks Ovsjanikov, LIX Polytechnique
- Bastien Blomme, IT systems