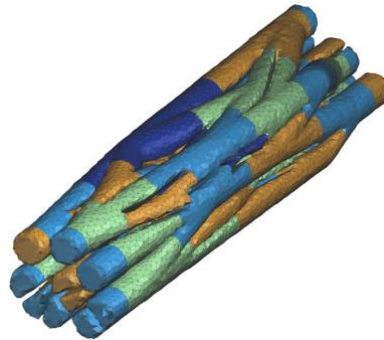# Development of meshing tools for generation of cardiac meshes at cellular scale

Research engineer fixed-term contract, 12 months, renewable

Context

The engineer will work in the context of the MICROCARD European project which aims at developing a production-ready simulation platform able to exploit future exascale computers and to simulate cardiac electrophysiology on models with micrometer resolution.

To do so, it is necessary to develop the tools that will automatically generate the 3D meshes (i.e. the spatial discretization of the computational domain) of the cardiac tissue from imaging data (mesh of both intracellular and extracellular domains).

Model of 50 myocytes (identified by colors), M. Potse

Missions

The engineer will be in charge of the development of the meshing tools and of the generation of 3D tetrahedral meshes for the project test cases. He/she will develop and/or improve the open source toolchain of mesh generation from segmented data (voxels labeled as vessels, myocyte, fibroblast…) provided by project partners:

1. Voxels tetrahedralization ;
2. Data filtering and cleaning ;
3. Explicit discretization of cellular domains by isovalue discretization and mesh improvement and adaptation (implementation within the parallel open source remesher ParMmg and the sequential remesher Mmg).

Desired profile

Master degree level, a first experience in software development as well as some knowledges in mesh generation and adaptation techniques would be appreciated.

Competences

- Programming: C language and MPI norm knowledges are required
- Classical programming tools: Git, CMake/CTest, Jenkins or github workflow, gdb…
- Linux environment
- Other: English (fluent), drafting ability and autonomy.

Location: Inria Bordeaux, 200, avenue de la Vieille Tour 33405 Talence CEDEX, CARMEN team
Employer: Université de Bordeaux
Starting date: 2022, between August and November
Application: Send a resume and cover letter to algiane.froehly@inria.fr