Georgia Institute Of Technology
Wallace H. Coulter Department Of Biomedical Engineering

Request to Use Non-BMED Undergraduate Research to Satisfy BME Depth/Technical Elective Requirements

Student's Name: Mahdi Al Husseini **Student Number:** _____

Course: _____ **Term:** _____ **Year:** _____ **Credit hours:** _____

Faculty research mentor: A. Veneziani **Faculty research department:** BME (Ext Prog Fac), Emory Math&CS

List previous semesters working in this lab for credit or pay: None

Research Statement (general description of research, including its relationship to BME; < 3000 characters):

The student is expected to
1) learn basics of computational fluid dynamics (coding in C++)
2) basics of image processing for vascular diseases (coding in C++/Python)
3) Apply numerical models to the investigation of cardiovascular diseases in clinical contexts.

Point 1: introduction to the incompressible Navier-Stokes Equations and their approximation with the Finite Element Method. Reference code: LifeV (developed by the advisor and his group)

Point 2: 3D reconstruction of vascular geometries from DICOM files (OCT/CT).
Reference code: Vascular Modeling ToolKit (VMTKLab)

Point 3: we plan to perform some preliminary analysis of blood flow in the Total CavoPulmonary Connection (TCPC) to assess the role of the shape of the connection on the flow distribution.

Signatures

Student	Date	Faculty Research Mentor	8/24/2017 Date

Approval

BME Associate Chair for UG Studies Date