Open MASc/PhD Position: Early Detection of Coronary Artery Bypass Graft Failure using Medical Imaging and Computational Fluid Dynamics

The research group of Prof. Piero Triverio at the University of Toronto is seeking a graduate student for a research project in computational fluid dynamics applied to coronary artery disease.

Project rationale: In Canada, about 1 person out of 7 dies because of coronary artery disease (CAD). Coronary arteries play a vital role, bringing oxygen-rich blood to the heart, but can become occluded. With graft surgery, new vessels are created to increase blood flow to the heart and prolong life. However, graft failure is quite common, and we still do not know exactly *why* grafts fail and, consequently, how to prevent their failure.

Goal: The objective of this research is to obtain new insights into the mechanisms responsible for graft failure, using computational fluid dynamics simulations guided by the latest advancements in medical imaging (CT and 4D-flow MRI). Simulations will be performed on a cohort of patients who had CAD surgery. Results will be correlated with patient outcomes one year after surgery. The project is in collaboration with Dr. Laura Jimenez-Juan (cardiovascular radiologist, Sunnybrook Health Sciences Centre), Dr. Stephen Fremes (cardiovascular surgeon, Sunnybrook Health Sciences Centre), and Prof. Gianluigi Rozza (professor of scientific computing, International School for Advanced Studies, Trieste, Italy).

Required qualifications: Bachelor's degree in engineering, applied mathematics, or a field closely related to the project.

Desired qualifications: Experience with computational fluid dynamics (highly desired), high-performance computing, medical imaging, cardiovascular simulations.

Institution and environment: The University of Toronto consistently ranks first in Canada and among the top universities in the world. Located in downtown Toronto, the university enjoys the lively and vibrant atmosphere of the city. With nearly all of the world's culture groups represented, and more than 100 languages spoken, Toronto is one of the most multicultural cities in the world.

More information: see this article

To apply: Email your CV and transcripts to `piero.triverio@utoronto.ca`. Applications will be assessed on a rolling basis. Only shortlisted candidates will be contacted.

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