



Laser imaging of flows through heart models

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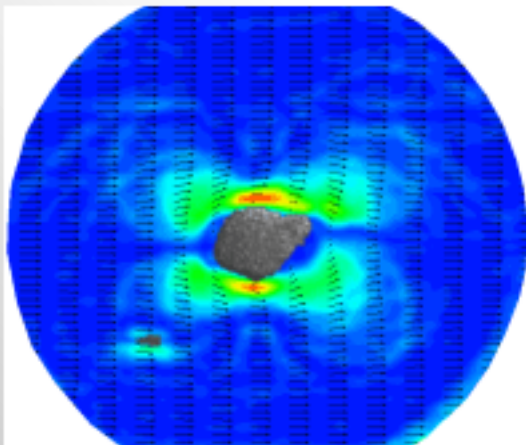
Department: Mechanical & Aerospace Engineering

Pre-requisites to do this project: You must currently be in your penultimate year (2011)

This project is open to: Students from Mechanical & Aerospace Engineering who have a keen interest in biological systems and biomedical imaging.

The Problem

The heart is a four chambered pump generating pulsatile flows throughout the body. The waveforms generated in the arteries are complex and the unsteady nature of the blood affects cellular function and plays an important role in cardiovascular diseases such as heart attack and stroke. The majority of medical research on blood flow has been done with steady or highly idealized flows ignoring the pulsatile nature of real blood flows.



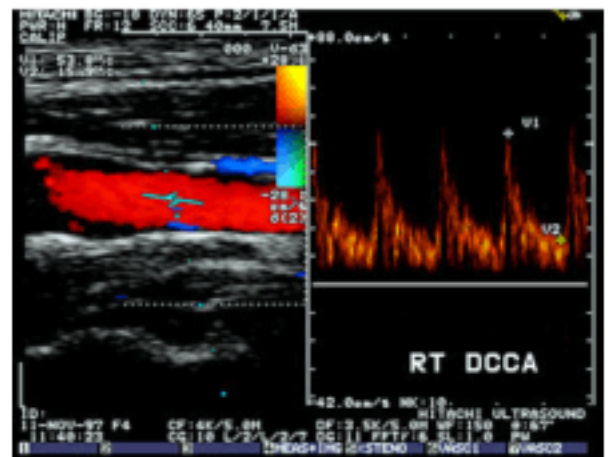
Laser imaging and velocimetry of flow around a thrombus showing the velocity vector field, with gradients of shear. Image courtesy: Elham Toluie, PhD student (Division of Biological Engineering, Monash University)

Facilities

- LDI experimental facilities
- World-leading image analysis suite

This project is offered in association with the Division of Biological Engineering

For more information about the Division, please visit: <http://www.mubeta.monash.edu/>



Ultrasound showing flow through an artery with flow velocity profile to the right. Image courtesy: Elham Toluie, PhD student (Engineering, Monash University)

The Project

You will use a pulsatile pump, custom designed and built by the MuBeta Lab to generate and study pulsatile flows in arterial models. The flows will be visualized and measured using laser based imaging techniques.

To achieve success in this challenging project, interest in **biomedical research** and **imaging** will be essential. The successful candidate will be required to work in a team including engineers and physicists.