UNIVERSITY OF GENOA
DEPARTMENT OF INFORMATICS, BIOENGINEERING, ROBOTICS AND SYSTEMS ENGINEERING
MASTER'S PROGRAM IN BIOENGINEERING

Dibris

Thesis Project Form

Title (tentative): Setup of an in vitro system to assess the performance of an assisted left ventricular device (LVaD)

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Description

Motivation and application domain

A left ventricular assist device (LVAD) is a pump that supports blood circulation and partially or completely replaces the function of a failing heart. LVADs can be used in patients with acute (sudden onset) or chronic (long-standing) heart failure. The device consists of a pump that works in parallel to the left ventricle; it pumps blood from the ventricle tip directly into the aorta.

General objectives and main activities

Various studies exist on the performance of LVADs but the problem of blood flow patterns in the aorta just after the connection of the shunt to the vessel has been disregarded so far. In this thesis, we propose to set up an experimental device to study, in particular, just downstream of the reentry of blood into the aorta. A model of the heart that has been developed at the University of Cagliari will be the basis for developing the new model.

Training Objectives (technical/analytical tools, experimental methodologies)

The student will be in charge of the experiment's setup and perform PIV blood flow measurements. The candidate will thus learn various experimental techniques, which are typically used in fluid mechanics.

Place(s) where the thesis work will be carried out: UniversitÃ di Cagliari

Additional information

Pre-requisite abilities/skills: Basic knowledge of fluid mechanics and cardiovascular blood flow

Maximum number of students: 1