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

Dibris

Thesis Project Form

Title (tentative): Numerical investigation of the role of eyelashes on the reduction of particle deposition on the cornea

Thesis advisor(s): Repetto Rodolfo, Jan Pralits (DICCA)

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Description

Motivation and application domain

The student will investigate with numerical simulations the role of eyelashes on the reduction of particle deposition on the cornea.

General objectives and main activities

Eyelashes are thought to have two important roles: i) they decrease the evaporation rate of the tear film and ii) protect the cornea from particle deposition. We propose study particle deposition on the ocular surface with numerical simulations with the aim of quantify the importance of eyelashes. We will consider various geometries of the cornea, the eyelashes and investigate the role of the properties of the incoming flow. We will also consider particles of various diameters and densities.

Training Objectives (technical/analytical tools, experimental methodologies)

The student will learn how to carry out numerical simulations of fluid flow and particle transport. We will use the free software OpenFOAM, which solves the governing equations using the finite volume method.

Place(s) where the thesis work will be carried out: DICCA

Additional information

Pre-requisite abilities/skills: Basic knowledge of fluid mechanics

Maximum number of students: 1