Title (tentative): Mechanical catheter design for endoscopic navigation

Thesis advisor(s): Storace Marco, Padraig Cantillon-Murphy (University College Cork, Ireland)

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### Description

**Motivation and application domain**

This project involves design, refinement, testing and validation of a novel mechanical user interface for lung catheter navigation at UCC. Lung cancer is the leading cause of cancer death globally and the key to survival is early diagnosis.

**General objectives and main activities**

This project is part of an ongoing effort at UCC to create an endoscopic platform which can reach further into the deep airways to facilitate real time. The project outcome will be a mechanical handle capable of actuating steering and control for an existing catheter configuration. The student will also be required to complete a thorough mechanical design analysis of the final design as well as complete a failure mode analysis for the prototype. The project will build upon existing expertise in mechanical device design at the Biomedical Design research group at University College Cork. The anticipated project duration is 6 months. Students with experience in 3D drawing (SolidWorks), rapid prototyping (3D printing) and mechanical design are most suitable. Further questions can be directed to padraig@alum.mit.edu

**Training Objectives (technical/analytical tools, experimental methodologies)**

The student will complete a peer-reviewed publication documenting the methodologies and outcomes. Mail technical tools: 3D CAD design, SolidWorks, AutoCAD or similar, 3D prototyping and printing.

**Place(s) where the thesis work will be carried out:** The Biomedical Design Research Group, University College Cork, Ireland

**Additional information**

**Pre-requisite abilities/skills:** 3D prototyping and printing experience is an advantage

**Maximum number of students:** 1