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Automatic
Control and
Systems
Engineering

The Department of Automatic Control & Systems Engineering
is pleased to announce the following seminar:

“Lifesaving Capsule Robots”

Professor Pietro Valdastri

*Chair in Robotics & Autonomous Systems,
School Electronic and Electrical Engineering, University of Leeds*

Wednesday, 3 April 2019 at 14:00

LT2, The Diamond

Abstract

The talk will focus on *Medical Capsule Robots*. Capsule robots are cm-size devices that leverage extreme miniaturization to access and operate in environments that are out of reach for larger robots. In medicine, capsule robots can be designed to be swallowed like a pill and to diagnose and treat mortal diseases, such as cancer. The talk will move from capsule robots for the inspection of the digestive tract toward a new generation of surgical robots and devices, having a relevant reduction in size, invasiveness, and cost as the main drivers for innovation. During the talk, we will discuss the recent enabling technologies that are being developed at the University of Leeds to transform medical robotics. These technologies include magnetic manipulation of capsule robots, hydraulic and pneumatic actuation, real-time tracking of capsule position and orientation, ultra-low-cost design, frugal innovation, and autonomy in robotic endoscopy.

Biography

Prof. Valdastri's academic career started with a Laurea degree *cum Laude* in Electronic Engineering from the University of Pisa in 2001 and a PhD degree *cum Laude* in Biomedical Engineering from Scuola Superiore Sant'Anna in 2006, with Prof. Paolo Dario as primary advisor. After the PhD, he served as Assistant Professor of Biomedical Engineering at the BioRobotics Institute of Scuola Superiore Sant'Anna for three years, focusing on implantable medical devices and surgical robotics. In 2011, Prof. Valdastri moved to Vanderbilt University, where he became Assistant Professor of Mechanical Engineering. There, Prof. Valdastri started the Science and Technologies Of Robotics in Medicine (STORM) Lab focusing on medical capsule robots for gastrointestinal endoscopy and abdominal surgery. In 2016, he moved to Leeds as Full Professor and Chair in Robotics and Autonomous Systems with a primary appointment in the School of Electronic and Electrical Engineering and a secondary appointment in the School of Mechanical Engineering. In Leeds, Prof. Valdastri is directing the [STORM Lab](#), the Institute of Robotics, Autonomous System and Sensing (IRASS), and the [Robotics at Leeds network](#). Prof. Valdastri is a Royal Society Wolfson Research Fellow, a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), the Editor for Medical and Rehabilitation Robotics of the IEEE Robotics and Automation Letters, a member of the Technology Committee of the European Association for Endoscopic Surgery (EAES), and a member of the steering committee of the International Society for Medical Innovation and Technology (iSMIT). In the last five years, Prof. Valdastri received more than €10M in research funding as Principal Investigator, including the National Science Foundation CAREER Award with the proposal “Lifesaving Capsule Robots” in 2015 and the European Research Council Consolidator Grant Award with the proposal “NoLiMiTs – Novel Lifesaving Magnetic Tentacles” in 2019. STORM Lab's research has been featured by several tech news outlets, including BBC, The Financial Times, The Spectator, WIRED, IEEE Spectrum, Medgadget, Medical Design Technology Magazine, Medical Xpress, Newswise, NSF Science Now.