

**27 January, 2pm (Ingram
Lecture Theatre)**

**Christos Bergeles
(UCL)**

**Micro-Surgical Robots for Dexterous
Vitreoretinal Interventions**

Vitreoretinal surgery is among the most skill-demanding interventions. The minuscule dimensions of the human eye vessels and the sensitivity of the eyes' photoreceptors on the retina require the application of forces that are commonly below the human's haptic perception. Further, the non-linear alteration of images due to the eye's optical system complicate the understanding of depth and the relative location of tools to the retina. All these issues pose significant hurdles to the adoption and success of novel interventions requiring the ultra-precise delivery of therapeutics such as drugs, genes, and stem cells. This talk will present advances in the field of microsurgical robots that aim to provide super-human dexterity to surgeons and spearhead the adoption of novel therapies. Mechatronics and imaging developments will be discussed, and the potential role of OCT in the precise and safe delivery of therapeutics will be highlighted.

About the speaker

Christos received his M.Sc. in Electrical and Computer Engineering from the National Technical University of Athens in 2006, and his PhD in Robots from ETH Zurich in 2011. Subsequently, he moved to Boston Children's Hospital/Harvard Medical School as a post-doctoral researcher. In 2013, he was awarded a Hamlyn Fellowship, and moved to the Hamlyn Centre for Robotic Surgery, Imperial College London. Since 2015, he is a Lecturer at the Dep. Medical Physics and Biomedical Engineering, University College London, within the Translational Imaging group of the Centre for Medical Image Computing. His current research focus lies in ophthalmology, developing devices for interventions like epiretinal membrane peeling, retinal vein cannulation, and laser treatment for diabetic retinopathy. These interventions require micromanipulation with sub-millimeter precision and with forces at the boundary of human perception, and combine microrobotics with surgery in a clinically challenging scenario.