

Christos Bergeles, PhD

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Qualifications

- **ETH Zurich** **Switzerland**
Doctor of Sciences *December 2006–March 2011*
I conducted my Ph.D. at the Institute of Robotics and Intelligent Systems, under the supervision of Prof. Bradley J. Nelson. The title of my thesis was "Visually servoing wireless untethered intraocular microrobots".
- **National Technical University of Athens** **Greece**
Dipl.-Ing. Electrical and Computer Engineering *October 2001–July 2006*
I graduated from ECE NTUA with First Class Honours (top 1%), with a major in Computer Science and minor in Signals, Systems, and Robotics. My M. Sc. thesis was on the topic of "Tracking of moving objects with emphasis on human gestures", conducted under the supervision of Prof. Petros Maragos.

Professional experience

- **Institute of Healthcare Engineering, University College London** **United Kingdom**
Engineering Lead, "Eyes for Life" Programme *January 2016–now*
I am the engineering leader of the "Eyes for Life" Flagship Programme of the UCL Institute of Healthcare Engineering. My role is to create fundamental resources and components and link the biological/clinical/engineering projects in ophthalmology towards a common concise goal: to enhance, maintain, and regain sight.
- **University College London** **United Kingdom**
Assistant Professor (UK Lecturer) *September 2015–now*
I am a member of the Translational Imaging Group of the Centre for Medical Image Computing. My team focuses on development of novel imaging devices, robots, and algorithms to assist surgery.
- **Imperial College London** **United Kingdom**
Hamlyn Fellow *May 2013–August 2015*
I was an independent Research Fellow at the Hamlyn Centre for Robotic Surgery of Imperial College London. I contributed endoscopic navigation algorithms to the Wellcome Trust funded Micro-IGES project led by Prof. Guang-Zhong Yang and Prof. Ara Darzi. As part of my independent research, I investigated flexible trocars for ophthalmic surgery and cost-effective ophthalmoscopy.
- **Respi, Inc.** **United States**
Co-founder and Technology Manager *September 2013–December 2015*
I co-founded, with Antonios Kouris, Respi, Inc. aiming to develop a smartphone-enabled spirometer for measuring the respiratory capacity of COPD sufferers and athletes *in situ*. I led the engineering team towards device prototyping. I left Respi, Inc. to devote my full attention to my academic duties.
- **Boston Children's Hospital and Harvard Medical School** **United States**
Research Fellow *January 2012–April 2013*
I worked under the supervision of Prof. Pierre Dupont. My research was on computational design of flexible robots and the development of MRI pulse sequences for the control of MRI-powered robot actuators.
- **ETH Zurich** **Switzerland**
Research Associate *April 2011–December 2011*

I led the evaluation of intraocular microrobots via animal trials, coordinating the team of engineers of the Multiscale Robotics Lab of the Institute of Robotics and Intelligent Systems and the veterinarians of Tierspital Zurich.

Awards and honours

- **Academic Grants Program (Quadro M5000)** **United States**
 ○ *NVIDIA Corp.* *April 2017*
 NVIDIA donated a graphics card for the project "OCT-guided robotic retinal interventions".
- **Best Presentation Award Finalist** **Italy**
 ○ *CRAS Workshop* *September 2016*
 George Dwyer was a finalist for the Best Presentation Award for our paper titled "Cooperative control with distal manipulation for fetoscopic laser photocoagulation".
- **EPSRC-funded Future Leaders Award (£29,224)** **United Kingdom**
 ○ *University College London* *September 2016*
 The award supports my research on "Image-guided micro-surgical robots for retinal stem cell delivery".
- **IPEM Outstanding M.Sc. Thesis Award** **United Kingdom**
 ○ *University College London* *September 2016*
 My student ZuiQui Duan was the recipient of this award for his thesis titled "Disrupting costly eye examinations in developing economies".
- **TEDMED Research Scholar** **United States**
 ○ *TEDMED* *February 2016 - December 2016*
 I was selected as a reviewer to safeguard the excellence of TEDMED's nominated speakers.
- **Best Application Paper Award** **Korea**
 ○ *IEEE Trans. Automation Science and Engineering* *August 2015*
 Our paper titled "Robust electromagnetic control of microrobots under force and localisation uncertainties" received the Best Paper Award (2014 publications in TASE).
- **Best Student Paper Award** **Greece**
 ○ *ICST Int. Conf. Wireless Mobile Communication and Healthcare* *November 2014*
 My student Charalampos Michailidis won this award for our paper titled "Development of a smartphone-enabled spirometer for personalised respiratory health".
- **Best Orally Presented Paper Finalist** **United Kingdom**
 ○ *Hamlyn Symposium on Medical Robotics* *July 2014*
 The nominated paper was titled "Intraoperative 3D fusion of microscopic and endoscopic images in transanal endoscopic microsurgery".
- **Fight for Sight Award (£5,000)** **United Kingdom**
 ○ *Fight for Sight & Royal College of Ophthalmologists* *June 2014*
 The award was granted to acknowledge my Doctoral and Post-doctoral contributions in ophthalmology.
- **SFEE Innovation Project (€15,000)** **Greece**
 ○ *Hellenic Association of Pharmaceutical Companies (SFEE)* *November 2013*
 This award funded our proposal of the smartphone-enabled spirometer and kick-started Respi, Inc.
- **Best Medical Robotics Paper Finalist** **Germany**
 ○ *IEEE Int. Conf. Robotics and Automation* *May 2013*
 The nominated paper was titled "Closed-loop commutation control of an MRI-powered robot actuator".

- **Travel Award (\$800)** **United States**
National Science Foundation *May 2012*
 NSF facilitated my participation at the IEEE Int. Conf. Robotics and Automation, where I presented my paper titled "Robust H-inf control for electromagnetic steering of microrobots".
- **Best Medical Robotics and CAI Systems Paper Finalist** **Canada**
Int. Conf. Medical Image Computing and Computer-Assisted Intervention *October 2011*
 The nominated paper was titled "Steerable intravitreal inserts for drug delivery: in vitro and ex vivo mobility experiments".
- **Best Computer Vision Paper Finalist** **China**
IEEE Int. Conf. Robotics and Automation *May 2011*
 The nominated paper was titled "Model-based localization of intraocular microrobots for wireless electromagnetic control".
- **Travel Award (CHF1,500)** **Switzerland**
ETH Zurich *May 2010*
 ETH Zurich facilitated my participation at the IEEE Int. Conf. Robotics and Automation, where I supported our Nanogram team.
- **Nanogram Championship Winner** **Austria**
Robocup *July 2009*
 I was a leader of our team participating and winning at the microrobotic soccer competition of Robocup.
- **Best Conference Paper Finalist** **United States**
IEEE Int. Conf. Biomedical Robotics and Biomechanics *October 2008*
 The nominated paper was titled "On imaging and localizing untethered intraocular devices with a stationary camera".
- **Best Student Paper Finalist** **United States**
IEEE Int. Conf. Biomedical Robotics and Biomechanics *October 2008*
 The nominated paper was titled "On imaging and localizing untethered intraocular devices with a stationary camera".
- **Academic Performance Award** **Greece**
Greek Chamber of Engineers *May 2008*
 Awarded for excellent academic performance while a student at NTUA (top 1%).
- **Best Presentation** **United States**
Int. Competition on Genetically Engineered Machines *November 2007*
 Our team delivered an excellent presentation of our research on genetically modified E. coli at iGEM at MIT.
- **Gold Medal** **United States**
Int. Competition on Genetically Engineered Machines *November 2007*
 Our team was ranked among the best internationally at iGEM at MIT.
- **German Academic Excellence Scholarship** **Germany**
DAAD foundation *July 2005–September 2005*
 I was the recipient of a 2-months scholarship to conduct an internship at TU Berlin.
- **Christos Kyriakopoulos Prize** **Greece**
Electrical and Computer Engineering School, National Technical University of Athens *2002–2003*
 Awarded for excellent performance in mathematics.
- **Nikolaos Kritikos Award** **Greece**
Electrical and Computer Engineering School, National Technical University of Athens *2002*
 Awarded for excellent performance in mathematics.

- **IKY Award** **Greece**
2002
State Scholarship Foundation (IKY)
Awarded for best academic performance during my first year of studies (valedictorian).
- **Best Student Project Award** **Greece**
2000
Centre for Renewable Energy Sources
Awarded for our project on "Reducing Energy Consumption in School Buildings".

Funding

- **Proof Of Concept (£37,299)** **IGT Network+**
October 2017–March 2018
Principle Investigator
"Towards cancer-margin assessment with coherent Raman spectroscopy" | Christos Bergeles (PI), Paola Borri, Wolfgang Langbein. The grant was conceived and written under my supervision by the researcher co-investigator Brice Thurin.
- **Centres of Excellence Scheme (£13,000,000)** **Wellcome Trust/EPSC**
May 2017–April 2022
Co-Investigator
"Wellcome Trust EPSC Centre for Surgical and Interventional Sciences " | S Ourselin (PI), T Vercauteren, L da Cruz, M Tiwari, C Bergeles (Co-I), S Homer-Vanniasinkam, AW McEvoy, D Stoyanov, H U Ahmed, J Kelly, J Deprest, B Davidson, S Punwani, M Emberton, P De Coppi, R C V Loureiro, A Desjardins, R M Brownstone, V A Diaz, M Clarkson, A J Hart, A L David, J C Dainty, D Hawkes, I P Parkin, A Blandford, P C Beard, G Hamilton, L Lovat, J Duncan, Y Ventikos.
- **ERC Starting Grant (€1,500,000)** **ERC**
April 2017–March 2022
Principle Investigator
"Peri-ocularly navigated exteroceptive snake robot for novel retinal interventions" | Christos Bergeles (PI).
- **Global Ophthalmology Awards Programme (\$50,000)** **Bayer**
January 2017–December 2017
Co-Investigator
"Development of automated analysis of ultra-widefield fluorescein images" | Sobha Sivaprasad (PI), Adam M. Dubis (Co-I), Christos Bergeles (Co-I), Philip Hykin (Co-I), Pearse Keane (Co-I).
- **AMS Springboard Grant (£99,876)** **Academy of Medical Sciences & Wellcome Trust**
September 2016–August 2018
Principle Investigator
"3D in-focus endoscopic imaging with light-field cameras: optomechatronics and algorithms" | Christos Bergeles (PI).
- **Departmental Ph.D. Scholarship (£92,634)** **University College London**
September 2016–August 2020
Principle Supervisor
Supporting Filip Paszkiewicz on "OCT-based visual servoing of microsurgical robots".
- **Healthcare Technologies Grand Challenges Network+ (£600,000)** **EPSC**
June 2016–May 2019
Co-Author
"Network in image-guided therapies" | Sebastien Ourselin (PI).
- **New Lecturer Grant (£20,000)** **Fight for Sight**
January 2016–December 2016
Principle Investigator
"Single-shot in-focus 3D ophthalmoscopy with micro-lens arrays" | Christos Bergeles (PI).
- **EPSC Institutional Support (£20,000)** **EPSC/Imperial College London**
July 2015–June 2016
Co-Investigator

"Winter school for surgical imaging and vision" | Guang-Zhong Yang (PI), Christos Bergeles (Co-I), Stamatia Giannarou (Co-I).

- **Surgical Robotics Small Grant Scheme (£39,000)** **NIHR Imperial BRC**
Principle Investigator *March 2014–February 2015*
"A concentric tube robot for deep cochlear implant insertion" | Christos Bergeles (PI), Guang-Zhong Yang (Co-I).
- **Accelerator Support (\$40,000)** **DreamIt Health Baltimore**
Co-Investigator *January 2014–May 2014*
"Respi: the smartphone spirometer" | Antonios Kouris (PI), Christos Bergeles (Co-I).
- **Wyss Project Grant (\$100,000)** **Wyss Institute**
Co-Investigator *January 2013–December 2014*
"MRI-powered milli-robot swarms for neurosurgery" | Pierre E. Dupont (PI), Panagiotis Vartholomeos (Co-I), Christos Bergeles (Co-I).
- **Technology Transfer Grant (CHF16,000)** **Swiss Academy of Engineering Sciences**
Co-Investigator *January 2011–December 2011*
"X-ray and fluorescence-based magnetic micro/nanorobot control" | Bradley J. Nelson (PI), Christos Bergeles (Co-I).

Supervisory experience

Post-Doctoral Researchers.....

- **Dr. Joan M. Nunez Do Rio** **Post-Doctoral Researcher**
Secondary Supervisor *February 2017–now*
Joan is processing retinal images and adaptive optics images to understand how disturbances in retinal blood flow correlate with disease.
- **Dr. Brice Thurin** **Post-Doctoral Researcher**
Primary Supervisor *January 2017–now*
Brice is modelling and experimenting with light-field systems for medical applications. Parts of his research investigate endoscopic imaging and ophthalmoscopy.

Ph. D. Students.....

- **Benjamin Davidson** **Ph. D. student**
Primary Supervisor *September 2016–August 2020*
Benjamin is investigating cell segmentation techniques in adaptive optics images, and multi-scale registration methodologies for multi-scale neuron-to-vessel retinal maps. Ben is co-supervised by Prof. Michel Michaelides, Moorfields Eye Hospital.
- **Anestis Mablekos-Alexiou** **Ph. D. student**
Secondary Supervisor *September 2016–August 2020*
Anestis is funded through Moorfields Eye Charity to research robotic technologies for precise stem-cell implantation. Anestis' primary supervisor is Prof. Lyndon da Cruz, Moorfields Eye Hospital.
- **Filip Pazskiewicz** **Ph. D. student**
Primary Supervisor *September 2016–August 2020*
Filip is funded through EPSRC to research multi-modal image registration algorithms and their application in visual servoing of ophthalmic robots. Filip is co-supervised by Prof. Lyndon da Cruz, Moorfields Eye Hospital.

- **Sotiris Nousias**
Primary Supervisor

Sotiris (M.Phil. 2017) is funded through Moorfields Eye Charity to conduct research on light-field imaging with applications on ophthalmoscopy and endoscopy. Sotiris is co-supervised by Dr. Pearse Keane, Moorfields Eye Hospital.

Ph. D. student
January 2016–December 2019
- **Konrad Leibrandt**
Post-doctoral Mentor

Konrad was a Ph. D. student of Prof. Guang-Zhong Yang at the Hamlyn Centre for Robotic Surgery, Imperial College London. I mentored him during his Ph. D. thesis and guided him on his research projects around computationally efficient inverse kinematics solvers for continuum robots.

Ph. D. student
May 2014–June 2016
- **Alessandro Vandini**
Post-doctoral Mentor

Alessandro was a Ph. D. student of Prof. Guang-Zhong Yang at the Hamlyn Centre for Robotic Surgery, Imperial College London. I mentored him during his Ph. D. thesis and guided him on his research projects around intraoperative vision-based shape estimation of continuum robots.

Ph. D. student
May 2013–June 2016
- M.Sc./M.Res. Students**.....
- **Prashant Kummar**
Primary Supervisor

Prashant works on computational design of flexible robots, aiming to increase the speed of existing design algorithms to interactive rates.

M. Sc. student
November 2016–August 2017
- **William Wood**
Primary Supervisor

Will worked on light-field imaging for medical applications, focusing on how micro-lens arrays can improve the imaging capabilities of ophthalmoscopes and endoscopes. He was co-supervised by Dr. Brice Thurin.

M. Res. student
November 2016–May 2017
- **Maxwell Flitton**
Primary Supervisor

Max works on the concept of information compression using events cameras, and more specifically in their application in combination with HD endoscopic systems. He is co-supervised by Sotiris Nousias.

M. Sc. student
November 2016–August 2017
- **ZuiQui Duan**
Primary Supervisor

ZuiQui worked on the topic of cost-effective ophthalmoscopy, developing a hand-held ophthalmoscope driven by system-on-a-chip processors. He was co-supervised by Luis Garcia Peraza Herrera.

M. Sc. student
November 2015–August 2016
- **Han (Kevin) Gao**
Primary Supervisor

Kevin worked on modelling of concentric tube robots using Finite Elements Analysis. He was co-supervised by Dr. Manish Tiwari from UCL Dep. Mechanical Engineering.

M. Sc. student
March 2016–August 2016
- **Malindie Sugathapala**
Primary Supervisor

Malindie worked on computational modeling of the fibrous structure of the vitreous humour. She was co-supervised by Prof. Guang-Zhong Yang.

M. Res. student
January 2015–August 2015
- **Fanyu Lin**
Primary Supervisor

Fangyu developed a prototype flexible vitreoretinal surgical robot based on concentric tubes. He was co-supervised by Prof. Guang-Zhong Yang.

M. Res. student
January 2014–August 2014

- **Hamal Marino** **M. Sc. student**
Primary Supervisor *January 2010–August 2011*
 Hamal developed an $H-\infty$ control algorithm to provably stabilise and manipulate magnetic microrobots. He was co-supervised by Prof. Bradley J. Nelson.
- **Kamran Shamaei** **M. Sc. student**
Primary Supervisor *January 2008–August 2009*
 Kamran developed a hand-held ophthalmoscope employing transcleral illumination and novel aspheric lenses. He was co-supervised by Prof. Bradley J. Nelson.
- **Georgios Fagogenis** **M. Sc. student**
Primary Supervisor *January 2007–August 2008*
 Georgios developed an image-based tracker and Kalman filter for estimating the position of intraocular microrobots. He was co-supervised by Prof. Bradley J. Nelson.
- **Daniela Schuler** **M. Sc. student**
Primary Supervisor *January 2007–August 2008*
 Daniela developed stereo reconstruction algorithms for estimating the 3D retinal structure from ophthalmoscopic images. She was co-supervised by Prof. Bradley J. Nelson.

B. Sc. Students.....

- **Olivia Wright** **B. Sc. student**
Primary Supervisor *November 2016–March 2017*
 Olivia conducted a literature survey on energy delivery to medical devices using ultrasound.
- **Shweta Lahiri** **B. Sc. student**
Primary Supervisor *November 2016–March 2017*
 Shweta conducted research on the benefits of endomicroscopy for micro-precise retinal surgery. She was co-supervised by Dr. Tom Vercauteren.
- **Yi Chou Han** **B. Sc. student**
Primary Supervisor *January 2011–May 2011*
 Yi Chou performed a literature survey on contrast enhancement techniques for medical imaging. He was co-supervised by Prof. Bradley J. Nelson.
- **Fabian Boesch** **B. Sc. student**
Primary Supervisor *January 2010–May 2010*
 Fabian investigated gesture-based control of microdevices. He was co-supervised by Prof. Bradley J. Nelson.

Teaching experience

- **Medical Instrumentation (4h teaching)** **Lecturer**
University College London *January–March 2017*
 - Covered the topics of microprocessors, microcontrollers, and binary numbers.
 - Prepared slides, exercise sessions and mock exams.
- **Clinical Engineering (8h teaching)** **Lecturer**
University College London *October–December 2015, 2016*
 - Covered the topics of transducers and measurements/calibration.
 - Prepared slides, exercise sessions and mock exams.
 - Prepared laboratory assignments on physiologic gait monitoring.

- **Biomedical Signal Processing and Control (5h teaching)** **Lecturer**
University College London *January–March 2017*
 - Covered the topics of control theory and feedback loops.
 - Prepared slides, exercise sessions and mock exams.
- **Medical Robotics and Instrumentation** **Teaching Assistant**
Imperial College London *October–December 2014–2015*
 - Prepared tutorials and exercise sessions.
 - Held regular office hours and advised students.
 - Gave multiple lecturer replacing the tutor.
- **Theory of Robotics and Mechatronics** **Teaching Assistant**
ETH Zurich *October–December 2007–2010*
 - Prepared tutorials and exercise sessions.
 - Prepared matlab code samples and visualisations of screw theory principles.
 - Trained new teaching assistant in screw theory.
 - Gave multiple lecturer replacing the tutor.
- **Programming Techniques** **Teaching Assistant**
ETH Zurich *March–June 2003–2005*
 - Held lab sessions and tutorials for students.
 - Supervised exams.

Professional community service

Examination committees.....

- **Ph. D. examiner** **ETH Zurich**
Institute of Robotics and Intelligent Systems *September 2016*
 I was on the Ph. D. thesis examination committee for Franziska Ullrich. Thesis title: "Assistive robotics for minimally invasive ophthalmic surgery".
- **M. Sc. viva examiner** **University College London**
Dep. Medical Physics and Biomedical Engineering *September 2016*

Editorial and chairing.....

- **Associate Editor** **IEEE Trans. Robotics**
IEEE Robotics and Automation Society *2017*
 I was responsible for allocating papers to reviewers, ensuring review quality, summarising the reviews and advocating acceptance/rejection to the Editor.
- **Associate Editor** **IEEE ICRA**
IEEE Robotics and Automation Society *2012, 2014, 2015, 2016, 2017*
 I am responsible for allocating papers to reviewers, ensuring review quality, summarising the reviews and advocating acceptance/rejection to the Editor.
- **Associate Editor** **IEEE BioRob**
IEEE Robotics and Automation Society *2016*
 I was responsible for allocating papers to reviewers, ensuring review quality, summarising the reviews and advocating acceptance/rejection to the Editor.
- **Associate Editor** **IEEE CASE**
IEEE Robotics and Automation Society *2016*

I was responsible for allocating papers to reviewers, ensuring review quality, summarising the reviews and advocating acceptance/rejection to the Editor.

Session Co-chair

IEEE IROS
2013

- *IEEE Robotics and Automation Society*

I co-chaired the "Medical Robotics I" session.

Scientific event and workshop organisation.....

"First-in-human - What does it take?"

Hamlyn Symposium

- *Co-organiser*

June 2017

The workshop was organised together with Prof. Russel Taylor and Prof. Pierre Dupont. It featured personal talks from academics who had successfully translated their robotics and medical device research to the clinic. It attracted 50 participants.

"C⁴ Surgical Robots"

ICRA 2017

- *Co-organiser*

June 2017

The workshop was organised together with Dr. Hongliang Ren, Prof. Pierre Dupont, Prof. Michael Yip, Prof. Ron Alterovitz. It featured talks from industry, academia, and healthcare, and attracted 70 participants.

"Winter School on Surgical Imaging and Vision"

Hamlyn Centre

- *Organising Committee*

December 2013, 2014, 2015, 2016

The Winter School grew into a very selective weeklong school attracting international participants and speakers. Twenty students were selected for participation each year.

"Advances in image-guided ophthalmic interventions"

Hamlyn Symposium

- *Organiser*

June 2016

The workshop was organised together with Dr. Raphael Sznitman from ARTORG Bern. It featured talks from industry, academia, and healthcare, and attracted 50 participants.

"Accelerate your code"

University College London

- *Organiser*

May 2016

I organised together with Jonny Hancox from Intel UK a workshop on multiprocessor programming techniques.

"Advances in flexible access robots for surgical interventions"

IEEE ICRA

- *Organiser*

May 2014

I organised together with Profs. Pierre Dupont (United States), Guang-Zhong Yang (United Kingdom), and Koji Ikuta (Japan) a workshop attracting approximately 100 participants.

"Magnetically actuated multiscale medical robots"

IEEE IROS

- *Co-Organiser*

October 2012

I organised together with Prof. Pierre Dupont and Dr. Panagiotis Vartholomeos a workshop covering magnetic actuation from nanometre to centimetre scale. The workshop attracted around 50 participants.

Reviewer.....

- Funding bodies: European Research Council (ERC), Swiss National Science Foundation (SNSF).
- Journals: TRO, TMECH, TMI, TBME, RAL, RAM.
- Conferences: ICRA, IROS, BioRob, CASE, MICCAI, Hamlyn Symposium.

Memberships.....

- Member of the IET TPN Robotics and Mechatronics board, 2015 - now.
- Member of IET, 2015 - now.
- Member of IEEE, 2004 - now.

Invited scientific talks

- **"Advanced robotics for retinal microinterventions and therapeutics delivery"** **GVRS**
Invited by Dr. Stamatia Kabanarou *January 2017*
- **"Computational advances on flexible robots for minimally invasive surgery"** **CURAC**
Invited by Dr. Raphael Sznitman *September 2016*
- **"Light-field imaging for in-focus single-shot 3D ophthalmoscopy"** **EUretina**
Invited by Dr. Tariq Aslam *September 2016*
- **"Computational advances in flexible robots"** **Italian Institute of Technology**
Invited by Dr. Leonardo de Mattos *June 2016*
- **"Microsurgical robots for ophthalmology"** **100% Optical Conference**
Invited by Julian Jackson *January 2016*
- **"Designing flexible robots for minimally invasive surgery"** **University of Basel**
Invited by Prof. Philippe Cattin *May 2015*
- **"Incorporating surgical task information in robot development"** **Hamlyn Symposium**
Invited by Dr. Stamatia Giannarou *June 2014*
- **"Towards MRI-powered and controlled medical devices"** **Harvard University**
Invited by Prof. Robert Howe *April 2013*
- **"Magnetic microrobots for minimally invasive interventions"** **Northeastern University**
Invited by Dr. Dimitrios Kanoulas *February 2012*
- **"Visually servoing wireless magnetic intraocular microrobots"** **Johns Hopkins University**
Invited by Prof. Gregory Hager *June 2011*

Public engagement and outreach

- **"Flexible micro-surgeons for regenerative and restorative interventions"** **Pint of Science**
Speaker, invited through festival organisers *May 2017*
- **"Surgical Robotics"** **IET Savoy Place**
Organiser *April 2017*
This afternoon event had three invited speakers and a panel discussion. Mr. Neil Tolley, ENT surgeon at Imperial College NHS and expert in robotic surgery presented the clinical challenges in surgical robotics. Dr. Sanja Dogramadzi discussed research advances in the field, and Prof. Brian Davies highlighted the challenges and opportunities along the commercialisation path.
- **"Robot ethics: research and ethical considerations of robotic surgery"** **IET Savoy Place**
Organiser *February 2017*
This afternoon event had two invited speakers and a panel discussion. Prof. Guang-Zhong Yang from Imperial College London will discuss research on surgical robotics, and Dr. Catherine Easton from Lancaster University will discuss legal and ethical aspects of using surgical robots.
- **"Fragmented communication: living with sensory impairments"** **Bloomsbury Festival**
Co-organiser *October 2016*

This day-long event was co-organised with the Institute of Healthcare Engineering and GiveVision. It showcased the effect of hearing and sight pathologies to the perception of sound and images, highlighting the detriment to the quality of life. The event attracted 100 participants from the public.

- **"Robotic eye surgery"** **Cafe Scientifique Salisbury**
Speaker, invited through the Fight for Sight Speaker Network *June 2016*
- **"Snakes and cameras for ophthalmology"** **Fight for Sight**
Speaker, invited by Dr. Dolores Conroy *March 2015*

Media Publicity

- The Innovators - The Ophthalmologist: It's all about perspective, Dec. 2016. [<https://goo.gl/5jfvpT>]
- Sideview - Macular Society: Robots get positive reaction, Dec. 2016. [<https://goo.gl/lhpDnp>, p. 10]
- Ellines.com: 5 Greeks among the top researchers in Europe, Sep. 2016. [<http://goo.gl/JiPmAH>]
- Optometry Today: Fight for Sight and the Speaker Network at 100% Optical, Feb. 2016. [<https://goo.gl/8DZk00>]
- fightforsight.org.uk: An eye for robotics leads to the 2014 Fight for Sight Award, July 2014.
- MIT Technology Review: Greece's Startups on The Rise: Tech entrepreneurs in Greece's burgeoning startup scene push back against a bleak narrative, May 19th 2015.
- To Vima: Pneumo: Measuring breathing through the smartphone, Nov. 2013. [in Greek] ("To Vima" is one of the two highest quality Sunday journals in Greece).
- Robohub.org: Minimally-invasive eye-surgery on the horizon, June 26th 2013.
- 30 Meres: Christos Bergeles: From Cholargos' public schools to the labs of Harvard, 2012. [in Greek]
- RSI LA1: Mi si e ristetto il robot, 2012. [in Italian]
- Reuters: Tiny robot operates inside the eye, 2011.
- 20 Minuten: Klein, aber oho: dieser Roboter gehts in Auge, 2011. [in German]
- To Vima: Little magnets grant vision, 2011. [in Greek]
- New Scientist: Drug-carrying robot roams through eye, Mar. 10th, 2011.
- PBS NOVA: Making Stuff Smaller, 2011.
- Discovery Channel: How microrobots could prevent blindness, 2010.
- Science et Vie Junior: Des microrobots dans le corps humain, 2010. [in French]
- New Scientist: Rise of the Medirobots, 2009.
- ETH Life: MagMite outperforms the competition, 2009.
- Nouvo, TSR: Cherie, j' ai retrechi le medecin!, 2008. [in French]
- The Economist: Swallow the surgeon, 2008.
- ETH Life: Gold fuer gebildete Bakterien, 2007. [in German]

Academic Publications

International journals.....

1. C. Bergeles, A. M. Dubis, B. Davidson, M. Kasilian, A. Kalitzeos, J. Carroll, A. Dubra, M. Michaelides, and S. Ourselin, "Unsupervised identification of cone photoreceptors in non-confocal adaptive optics scanning light ophthalmoscope images", *Biomedical Optics Express*, vol. 8, no. 6, pp. 3081-3094, 2017.
2. A. Vandini, C. Bergeles, B. Glocker, P. Giataganas, and G.-Z. Yang, "Unified tracking and shape estimation for concentric tube robots," *IEEE Trans. Robotics*, 2017, **in press**.
3. K. Leibrandt, C. Bergeles, and G.-Z. Yang, "Rapid path-planning for unstable concentric tube robot guidance," *IEEE Robotics and Automation Magazine (RAM)*, 2017, **in press**.
4. G. Dwyer, F. Chadebecq, M. T. Amo, C. Bergeles, E. Maneas, V. Pawar, E. Vander Poorten, J. Deprest, S. Ourselin, P. De Coppi, T. Vercauteren, and D. Stoyanov, "A continuum robot and control interface for surgical assist in fetoscopic interventions," *IEEE Robotics and Automation Letters (RAL)*, vol. 2, no. 3, pp. 1656-1663, 2017.
5. C. Bergeles, and L. Da Cruz, "Keep an eye on robotics: emerging vitreoretinal surgical platforms," *Optometry Today*, pp. 58-63, Dec. 2016.
6. C. Bergeles, A. Gosline, N. Vasilyev, P. Codd, P. J. del Nido, and P. E. Dupont, "Concentric tube robot design and optimization based on task and anatomical constraints," *IEEE Trans. Robotics (TRO)*, vol. 31, no. 1, pp. 67-84, 2015.
7. O. Felfoul, A. Becker, C. Bergeles, and P. E. Dupont, "Achieving commutation control of an MRI-powered robot actuator," *IEEE Trans. Robotics (TRO)*, vol. 31, no. 2, pp. 387-399, 2015.
8. C. Bergeles, and G.-Z. Yang, "From passive tool holders to microsurgions: safer, smaller, smarter surgical robots," *IEEE Trans. Biomedical Engineering (TBME)*, vol. 61, no. 5, pp. 1565-1576, 2014.
9. H. Marino, C. Bergeles (co-first), and B. J. Nelson, "Robust electromagnetic control of microrobots under force and localization uncertainties," *IEEE Trans. Automation Science and Engineering (TASE)*, vol. 11, no. 1, pp. 310-316, 2014, **Best Application Paper Award**.
10. P. Vartholomeos, C. Bergeles, L. Qin, and P. E. Dupont, "An MRI-powered and controlled actuator technology for tetherless robotic interventions," *Int. J. Robotics Research (IJRR)*, vol. 32, no. 13, pp. 1536-1552, 2013.
11. F. Ullrich, C. Bergeles, J. Pokki, O. Ergeneman, S. Erni, G. Chatzipirpiridis, S. Pané, C. Framme, and B. J. Nelson, "Mobility experiments with microrobots for minimally invasive intraocular surgery," *Investigative Ophthalmology and Visual Science (IOVS)*, vol. 54, no. 4, pp. 2853-2863, 2013.
12. C. Bergeles, B. E. Kratochvil, and B. J. Nelson, "Visually servoing magnetic intraocular micro-robots," *IEEE Trans. Robotics (TRO)*, vol. 28, no. 4, pp. 798-809, 2012.
13. C. Bergeles, K. Shamaei, J. J. Abbott, and B. J. Nelson, "Single-camera focus-based localization of intraocular devices," *IEEE Trans. Biomedical Engineering (TBME)*, vol. 57, no. 8, pp. 2064-2074, 2010.
14. L. Zhang, J. J. Abbott, K. Peyer, B. E. Kratochvil, H. Zhang, C. Bergeles, and B. J. Nelson, "Characterizing the swimming properties of artificial bacterial flagella," *Nano Letters*, vol. 9, no. 10, pp. 3663-3667, 2009.

Refereed full paper conference publications.....

1. K. Leibrandt, C. Bergeles, and G.-Z. Yang, "Implicit active constraints for concentric tube robots based on analysis of the safe and dexterous workspace," **under review**.

2. K. Leibrandt, C. Bergeles, and G.-Z. Yang, "Implicit active constraints for safe and effective guidance of unstable concentric tube robots," *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, pp. 1157–1163, 2016.
3. G. Fagogenis, C. Bergeles, and P. E. Dupont, "Adaptive nonparametric kinematic modeling of concentric tube robots," *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, pp. 4324–4329, 2016.
4. N. Liu, C. Bergeles, and G.-Z. Yang, "Design and analysis of a new wire-driven flexible manipulator for bronchoscopic interventions," *IEEE Int. Conf. Robotics and Automation (ICRA)*, pp. 4058–4063, 2016.
5. C. Bergeles, P. Berthet-Rayne, P. McCormac, L. C. Garcia-Peraza-Herrera, K. Onyenso, F. Cao, K. Vyas, M. Berthelot, and G.-Z. Yang, "Accessible digital ophthalmoscopy based on liquid-lens technology," *Int. Conf. Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 571–578, 2015.
6. F.-Y. Lin, C. Bergeles, and G.-Z. Yang, "Biometry-based concentric tubes robot for vitreoretinal surgery," *IEEE Engineering in Medicine and Biology Conf. (EMBC)*, pp. 5280–5284, 2015.
7. K. Leibrandt, C. Bergeles, and G.-Z. Yang, "On-line collision-free inverse kinematics with frictional active constraints for effective control of unstable concentric tube robots," *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, pp. 3797–3804, 2015.
8. A. Vandini, C. Bergeles, F.-Y. Lin, and G.-Z. Yang, "Intraoperative vision-based shape sensing of concentric tube robots," *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, pp. 2603–2610, 2015.
9. M. Power, H. Rafii-Tari, C. Bergeles, V. Vitiello, and G.-Z. Yang, "A cooperative control framework for haptic guidance with bimanual surgical tasks based on learning from demonstration," *IEEE Int. Conf. Robotics and Automation (ICRA)*, pp. 5330–5337, 2015.
10. C. Bergeles, P. Pratt, R. Merrifield, A. Darzi, and G.-Z. Yang, "Multi-view stereo reconstruction and advanced navigation for transanal endoscopic microsurgery," *Int. Conf. Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 332–339, 2014.
11. P. Pratt, C. Bergeles, A. Darzi, and G.-Z. Yang, "Practical intraoperative stereo camera calibration," *Int. Conf. Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 667–675, 2014.
12. C. Michailidis, I. Smanis (co-first), K. Stamatis, C. Bergeles, and A. Kouris, "Development of a smartphone-enabled spirometer for personalised respiratory health", *ICST Int. Conf. Wireless Mobile Communication and Healthcare*, pp. 66–70, 2014, **Best Student Paper Finalist**.
13. C. Bergeles, and P. E. Dupont, "Planning stable paths for concentric tube robots," *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, pp. 3077–3082, 2013.
14. C. Bergeles, P. Vartholomeos, L. Qin, and P. E. Dupont, "Closed-loop commutator control of an MRI-powered actuator," *IEEE Int. Conf. Robotics and Automation (ICRA)*, pp. 690–695, 2013, **Best Medical Robotics Paper Finalist**.
15. C. Bergeles, L. Qin, P. Vartholomeos, P. E. Dupont, "Tracking and position control of an MRI-powered needle-insertion robot," *IEEE Engineering in Medicine and Biology Conf. (EMBC)*, pp. 928–931, 2012.
16. J. Pokki, O. Ergeneman, C. Bergeles, H. Torun, and B. J. Nelson, "Localized viscoelasticity measurements with untethered intravitreal microrobots," *IEEE Engineering in Medicine and Biology Conf. (EMBC)*, pp. 2813–2816, 2012.
17. H. Marino, C. Bergeles, and B. J. Nelson, "Robust \mathcal{H}_∞ control for electromagnetic steering of microrobots," *IEEE Int. Conf. Robotics and Automation (ICRA)*, pp. 2498–2503, 2012.

18. C. Bergeles, M. P. Kummer, B. E. Kratochvil, C. Framme, and B. J. Nelson, "Steerable intravitreal inserts for drug delivery: *in vitro* and *ex vivo* mobility experiments," *Int. Conf. Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 33–40, 2011, **Best Medical Robotics and CAI Systems Award Finalist**.
19. O. Ergeneman, G. Chatzipirpiridis, S. Pané, G. A. Sotiriou, C. Bergeles, and B. J. Nelson, "Wireless microrobotic oxygen sensing for retinal hypoxia monitoring," *ICST Int. Conf. Wireless Mobile Communication and Healthcare*, 2011.
20. C. Bergeles, B. E. Kratochvil, and B. J. Nelson, "Model-based localization of intraocular micro-robots for wireless electromagnetic control," *IEEE Int. Conf. Robotics and Automation (ICRA)*, pp. 2617–2622, 2011, **Best Vision Paper Finalist**.
21. C. Bergeles, K. Shamaei, J. J. Abbott, and B. J. Nelson, "Wide-angle intraocular imaging and localization," *Int. Conf. Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 540–548, 2009.
22. C. Bergeles, K. Shamaei, J. J. Abbott, and B. J. Nelson, "Wide-angle localization of intraocular devices from focus," *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, pp. 4523–4528, 2009.
23. C. Bergeles, G. Fagogenis, J. J. Abbott, and B. J. Nelson, "Tracking intraocular microdevices based on colorspace evaluation and statistical color/shape information," *IEEE Int. Conf. Robotics and Automation (ICRA)*, pp. 3934–3939, 2009.
24. C. Bergeles, K. Shamaei, J. J. Abbott, and B. J. Nelson, "On imaging and localizing untethered intraocular devices with a stationary camera," *IEEE Int. Conf. Biomedical Robotics and Biomechanics (BioRob)*, pp. 489–494, 2008, **Best Conference Paper Finalist, Best Student Paper Finalist**.

Refereed abstract conference publications.....

1. G. Dwyer, C. Bergeles, F. Chadebecq, V. Pawar, E. Vander Poorten, S. Ourselin, J. Deprest, P. De Coppi, T. Vercauteren, and D. Stoyanov, "Cooperative control with distal manipulation for fetoscopic laser photocoagulation", *Joint Workshop on New Technologies for Computer/Robot Assisted Surgery*, 2016, **Best Presentation Award Finalist**.
2. C. Bergeles, F.-Y. Lin, and G.-Z. Yang, "Concentric tube robot kinematics using neural networks," *Hamlyn Symposium on Medical Robotics*, 2015, **Oral Presentation**.
3. H H. King, J. Shang, J. Liu, C. Seneci, P. Wisanuvej, P. Giataganas, N. Patel, J. Clark, V. Vitiello, C. Bergeles, P. Pratt, K. Kerr, A. Darzi, G.-Z. Yang, "Micro-IGES robot for transanal robotic microsurgery," *Hamlyn Symposium on Medical Robotics*, 2015, **Oral Presentation**.
4. A. Kouris, C. Michailidis, and C. Bergeles, "Shifting respiratory care from lungs to patients: the necessity for patient-focused approach," *Int. Cong. European Respiratory Society*, 2015.
5. P. Giataganas, C. Bergeles, P. Pratt, M. Hughes, A. Darzi, and G.-Z. Yang, "Intraoperative 3D fusion of microscopic and endoscopic images in transanal endoscopic microsurgery," *Hamlyn Symposium on Medical Robotics*, 2014, **Oral Presentation, Best Orally Presented Paper Finalist**.
6. C. Bergeles, P. Vartholomeos, L. Qin, and P. E. Dupont, "RF-selective-excitation for state estimation of an MRI-powered motor," *Int. Symp. Magnetic Resonance in Medicine*, 2013.
7. P. Vartholomeos, C. Bergeles, L. Qin, and P. E. Dupont, "Closed-loop position control of an MRI-powered biopsy robot," *Hamlyn Symposium on Medical Robotics*, pp. 83-84, 2012.
8. C. Bergeles, P. Vartholomeos, L. Qin, and P. E. Dupont, "Closed-loop commutator control of an MRI-powered actuator," *Image Guided Therapy Workshop*, 2012.
9. S. Schuerle, B. E. Kratochvil, C. Bergeles, S. Erni, and B. J. Nelson, "An electromagnetic

manipulation system for pre-clinical testing of targeted drug delivery," *Int. Conf. Scientific and Clinical Applications of Magnetic Carriers*, 2012.

10. C. Framme, C. Bergeles, O. Ergeneman, B. E. Kratochvil, M. P. Kummer, S. Pané, V. Pocepova, and B. J. Nelson, "Magnetically steered inserts for minimally invasive intravitreal surgical procedures," *Deutsches Ophthalmologie Gesellschaft*, 2011.
11. C. Bergeles, M. P. Kummer, B. E. Kratochvil, J. J. Abbott, and B. J. Nelson, "Ex vivo experiments with intraocular microrobots," *IEEE Int. Conf. Robotics and Automation (ICRA), Workshop on Mesoscale Robotics for Medical Interventions*, 2010.

Book chapters.....

1. C. Bergeles *Towards intracorporeally navigated untethered microsurgions*, Encyclopedia of Medical Robotics, **in press**.
2. O. Ergeneman, C. Bergeles, M. P. Kummer, J. J. Abbott, and B. J. Nelson, *Wireless intraocular microrobots: opportunities and challenges*, 1st ed., ser. Surgical Robotics: Systems, Applications, and Visions, J. Rosen, B. Hannaford, and R. Satava, Eds. Springer-Verlag GbmH, Heidelberg, 2011, vol. XXII.

Patent applications.....

1. K. Shamaei, C. Bergeles, J. J. Abbott, and B. J. Nelson, "Ophthalmoscopy using direct sensing of the flat aerial image created by an aspheric lens," Patent W.O. 2010/034502 A2, April 1 2010 (no longer supported).

Theses.....

1. C. Bergeles, "Visually servoing wireless magnetic intraocular microrobots," Ph. D. dissertation, ETH Zurich, 2011.
2. C. Bergeles, "Visual tracking of moving objects with emphasis on human gestures," Diploma thesis, National Technical University of Athens, 2006.

Interests and extra-curricular activities

- **Traveling:** I enjoy hiking trips around the world, having hiked the Circle Trail in the Annapurna of Nepal, and the Salkantay Trail in Peru. My next hiking goal: Bhutan.
- **Snowboarding:** I have been snowboarding since 2006, a habit I acquired during my Ph.D. in Switzerland. I am currently on the upper intermediate level.
- **Windsurfing:** I am a beginner windsurfer, attempting to figure out whether riding the waves and the snow is similar.

References

- Up to 4 references available on request