

Christos Bergeles, Ph.D.

Pediatric Cardiac Bioengineering
Harvard Medical School and Children's Hospital Boston
Room 350, Ender's Building
320 Longwood Avenue, Boston MA 02115

Citizen of the Grece
Born on 21.03.1984

Education

Ph.D. Mechanical Engineering (Dec. 2006 - Mar. 2011)
Institute of Robotics and Intelligent Systems, ETH Zurich, 2011
Thesis title: "Visually Servoing Wireless Untethered Intraocular Microrobots"

Diploma (M.Sc.) Electrical and Computer Engineering (Oct. 2001 - Jul. 2006)
National Technical University of Athens (NTUA), 2006
G.P.A.: 9.52/10.0 (top 1%)
Thesis title: "Tracking of Moving Objects with Emphasis on Human Gestures"

Research Interests

Medical Image Analysis, Computer Vision, Surgical Robotics, Microrobotics.

Professional Experience

Research Fellow Jan. 2012 - now
Harvard Medical School, Children's Hospital
Boston, Massachusetts
Research on MRI actuated robots.

Research Associate Mar. 2011 - Dec. 2011
ETH Zurich, Institute of Robotics and Intelligent
Zürich, Switzerland
Systems
Research and evaluation (*in vitro*, *ex vivo*, *in vivo*) of microrobots for retinal drug delivery.

Research Assistant Oct. 2006 - Mar. 2011
ETH Zurich, Institute of Robotics and Intelligent
Zürich, Switzerland
Systems
Research and development of localization algorithms for untethered intraocular microrobots. Research on the mobility of steerable intravitreal implants.

IT Responsible Jan. 2008 - Oct. 2011
ETH Zurich, Institute of Robotics and Intelligent
Zürich, Switzerland
Systems
Responsible for first-level IT support in Linux and Windows PCs at the Multiscale Robotics Laboratory of the Institute of Robotics and Intelligent Systems.

Intern - Computer Science Jul. 2005 - Aug. 2005
TU Berlin, Fak III
Berlin, Germany
Design and implementation a mini content management system for the events and courses for Fak. 3 of TU Berlin. Contribution in the design of a geo-based portal.

Intern - Software Engineering Sep. 2004 - Oct. 2004
Institute for Language and Speech Processing
Marousi, Greece
Beta-testing on Simfonia, a greek-language spell-checking tool for Microsofts Word.

Teaching Experience

Teaching Assistant 2007 - 2009
Institute of Robotics and Intelligent Systems Zürich, Switzerland
Preparation of tutorials and lectures for the course of "Theory of Robotics and Mechatronics".

Teaching Assistant 2009
Institute of Robotics and Intelligent Systems Zürich, Switzerland
Student guidance and team co-leader for the participation in Robocup 2009 (course of "Advanced Robotics and Mechatronics").

Laboratory Assistant 2007
Institute of Robotics and Intelligent Systems Zürich, Switzerland
Assistance in debugging and developing for the course of "Introduction to Robotics and Mechatronics".

Laboratory Assistant 2003 - 2005
School of Electrical and Computer Engineering Athens, Greece
Performing of exercise sessions on C for the course of "Programming Techniques".

Laboratory Assistant 2002 - 2004
School of Electrical and Computer Engineering Athens, Greece
Performing of exercise sessions on PASCAL for the course of "Introduction to Programming".

Professional Activities

Associate Editor: ICRA 2012.

Reviewer: Ro-Man 2008, BioRob 2008, ICRA 2009, 2010, 2011, 2012, IROS 2009, 2010, 2011, AIM 2010.

Research and networking workshop co-organizer: 2-day workshop for 50 participants, Aug.2010.

Member of the recruitment and marketing team of Zurich's local IAESTE committee, 2008–2011.

Member of the IEEE Robotics and Automation Society, 2012–now.

Member of the IEEE Engineering in Medicine and Biology Society, 2012–now.

Student Member of the IEEE Robotics and Automation Society, 2004–2011.

Student Member of the IEEE Engineering in Medicine and Biology Society, 2004–2011.

IEEE Student Branch Board Member: Responsible for recruitment and marketing, 2005–2006.

Awards

Best Medical Robotics and CAI Systems Paper Award Finalist at the Int. Conf. Medical Image Analysis and Computer-Assisted Interventions., Toronto, 2011.

Recipient of the Transferkolleg 2011 support for my proposal "X-Ray and Fluorescence-Based Magnetic Micro/Nanorobot Control for In Vivo Navigation and Drug Delivery" (16000 CHF).

Best Vision Paper Finalist at the Int. Conf. Robotics and Automation, Shanghai, 2011.

ETH Travel Support for the Int. Conf. on Robotics and Automation, Alaska, 2010 (1500 CHF).

Member of the World Champion ETH Team at the Nanogram League of Robocup, Austria, 2009.

Best Conference Paper Finalist and Best Student Paper Finalist at the IEEE Int. Conf. Biomedical Robotics and Biomechatronics, Arizona, 2008.

Greek Chamber of Engineers Award for overall academic performance (2001-2006), 2008.

Best Presentation Award and Gold Medal at the Int. Genetically Engineered Machines Competition, MIT, Massachusetts, 2007.

Chr. Papakyriakopoulos mathematics award, NTUA, Greece, 2002, 2003.
N. Kritikos mathematics award, NTUA, Greece, 2002, 2003.
Ranked 1st among 300 students during 2001–2002, NTUA, Greece, 2002.
State Scholarship Foundation (IKY) award for excellent performance, NTUA, Greece, 2002.
Best Student Project Award for “Reducing Energy Consumption in School Buildings”, Greece, 2000.
Hellenic Ministry of Education Award for outstanding national-wide performance at the university entrance examinations, 2000.

Invited Talks

Northeastern University, Ph.D. Student Seminar (invited by Dimitris Kanoulas), 01/2012
Harvard Medical School, Biorobotics Lab (invited by Prof. Pierre Dupont), 07/2011.
Johns Hopkins University, Computational Interaction and Robotics Lab (invited by Prof. Gregory Hager), 06/2011.
Microsoft Research Cambridge, Machine Learning Laboratory (invited by Dr. Antonio Criminisi, and Dr. Abigail Sellen), 04/2011.

Technical Skills

Development: Matlab, C++, Qt4, OpenCV, C, PHP, OSLO, C#, CUDA.
Operating Systems: Linux, Mac OS X, Windows XP/Vista/7.
Image Processing: ImageJ, Adobe Illustrator, Adobe Lightroom, Adobe Photoshop.

Languages

Greek: *Native speaker*.
English: *Excellent* - Proficiency of Michigan, Proficiency of Cambridge.
French: *Intermediate* - Delf 1^{er} Degree.
German: *Basic/Intermediate*.
Chinese: *Beginner* - 2 years of studies.

Academic Publications

International Journals and Top Conferences

C. Bergeles, B. E. Kratochvil, and B. J. Nelson, “Visually servoing magnetic intraocular micro-robots,” *IEEE Trans. Robotics*, 2011, accepted.

C. Bergeles, M. P. Kummer, B. E. Kratochvil, C. Framme, and B. J. Nelson, “Steerable intravitreal inser for drug delivery: *in vitro* and *ex vivo* mobility experiments,” *in proc. Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 33–40, 2011, **Best Medical Robotics and CAI Systems Award Finalist**.

C. Bergeles, K. Shamaei, J. J. Abbott, and B. J. Nelson, “Single-camera focus-based localization of intraocular devices,” *IEEE Trans. Biomedical Engineering*, vol. 57, no. 8, pp. 2064–2074, 2010.

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.

C. Bergeles, K. Shamaei, J. J. Abbott, and B. J. Nelson, "Wide-angle intraocular imaging and localization," in *proc. Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 540–548, 2009.

Book Chapters

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, December 2010, vol. XXII.

Full Paper International Conferences and Workshops

H. Marino, C. Bergeles, and B. J. Nelson, "Robust \mathcal{H}_∞ control for electromagnetic steering of microrobots," *IEEE Int. Conf. Robotics and Automation*, 2012, accepted.

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.

C. Bergeles, B. E. Kratochvil, and B. J. Nelson, "Model-based localization of intraocular microrobots for wireless electromagnetic control," *IEEE Int. Conf. Robotics and Automation*, pp. 2617–2622, 2011, **Best Vision Paper Finalist**.

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, Workshop on Mesoscale Robotics for Medical Interventions, Poster Presentation*, 2010.

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*, pp. 4523–4528, 2009.

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*, pp. 3934–3939, 2009.

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*, pp. 489–494, 2008, **Best Conference Paper Finalist, Best Student Paper Finalist**.

Patents

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.

Abstract-Based Conferences and Workshops

C. Framme, C. Bergeles, O. Ergeneman, B. E. Kratochvil, M. P. Kummer, S. Pané, V. Pospelova, and B. J. Nelson, "Magnetically steered inserts for minimally invasive intravitreal surgical procedures," *Deutsches Ophthalmologie Gesellschaft*, 2011.

Theses

C. Bergeles, "Visually servoing wireless magnetic intraocular microrobots," Ph.D. dissertation, ETH Zurich, 2011.

C. Bergeles, "Visual tracking of moving objects with emphasis on human gestures," Diploma thesis, National Technical University of Athens, 2006.