Hamlyn Symposium 2012
Sunday 1st July 2012

The Royal Geographical Society, 1 Kensington Gore, London, SW7 2AR
http://www.rgs.org/HomePage.htm

09:00 - 09:30  Registration and Coffee

09:30 - 09:45  Welcome and Introduction - Professor Ara Darzi, Co-Director of The Hamlyn Centre for Robotic Surgery

Session 1: Training and Clinical Outcomes

09:45 - 10:15  Invited Lecture – Robotics and Urology
Dr. Vipul Patel
Medical Director of the Global Robotics Institute at Celebration Health and Medical Director of the Urologic Oncology Program for the Florida Hospital Cancer Institute

10:15 - 10:30  The Impact Of Trainees On Surgical Outcomes Following Robotic Assisted Radical Prostatectomy (RARP)
LS Lee, GL Shaw, DE Neal, N Shah
Department of Urology, Addenbrookes Hospital, Cambridge, UK

10:30 - 10:45  Short And Long Term Complications Of Robotic Abdominal Surgery In Children
N Gattas1, C Smith2, N Alizai2, C Van-Wyk2, J Sellors2, S Whiteley2, A Najmaldin2
1School of Medicine, University of Queensland, Australia
2Paediatric Surgery, Leeds Teaching Hospitals NHS Trust, United Kingdom
10.45-11.00  A New Global Ratings Scale For Assessing Virtual Reality Arthroscopy Simulator Performance Results Of A Pilot Study
Kash Akhtar1,2, Sofia Bayona3, Alex Dodds1, David Shier1, Chinmay Gupte1, Fernando Bello1, Roger Emery1, Justin Cobb1
1Department of Surgery & Cancer, Imperial College London
2School of Surgery, London Deanery
3Department of Computer Architecture and Technology, Computing Sciences, and Artificial Intelligence, Universidad Rey Juan Carlos, Madrid

11.00-11.15  Retrograde Versus Antegrade Nerve-Sparing During Robot-Assisted Radical Prostatectomy: Which Is Better For Early Functional Outcomes?
Ananthakrishnan Sivaraman, Young Hwii Ko, Rafael F. Coelho, Sanket Chauhan, Oscar Schatloff, Srinivas Samavedi, Camilo Giedelman, Kenneth Palmer and Vipul R. Patel
Global Robotics Institute, University of Central Florida, School of Medicine, Orlando, USA

11:15-11.45  Coffee Break and Poster Presentations

11.45-12.45  Poster Teasers Session 1 (3 minute presentations)

P1.  Functional Outcomes Following Transoral Robotic Surgery For Obstructive Sleep Apnoea
A. Arora1, B. Kotecha2, A. Hassaan3, Z. Awad1, J. Budge1, A. Darzi3, N. Tolley1
1ENT Department, St Mary's Hospital, Imperial College Healthcare NHS Trust, London
2Royal National Throat Nose and Ear Hospital, London
3Department of Biosurgery and Surgical Technology, St Mary’s Hospital, Imperial College London

P2.  Patient-Specific 3D Surgical Planning To Perform Cutting Edge Robotic Surgery
Carbone M.1, Cappelli C.2, Ferrari V.1, Signori S.3, De Lio N.3, Perrone V.3, Mosca F.1, Boggi U.3
1EndoCAS – University Hospital of Pisa,
N Gattas^1, A White^2, S Whiteley^3 and A Najmaldin^2
^1School of Medicine, University of Queensland, Australia
^2Paediatric Surgery, Leeds Teaching Hospitals NHS Trust, United Kingdom

P4. Can Biometric Measures Predict Feasibility In Transoral Robotic Surgery (TORS)?
A.Arora^1, A.Acharya^2, S.Khemani^3, J.Kotecha^4, A.Darzi^2, B.Kotecha^4
N.Tolley^5
^1Dept. Of Otolaryngology, Imperial College Healthcare NHS Trust
^2Division of Surgery, Imperial College London
^3Dept. Of Otolaryngology, Surrey and Sussex NHS Trust
^4Royal National Throat Nose and Ear Hospital, London

P5. Optimizing Oncological And Functional Outcomes With Robot Assisted Radical Prostatectomy(RALP) In Preoperatively High Risk Prostate Cancer Patients
Ananthakrishnan Sivaraman, Rafael F. Coelho, Sanket Chauhan, Oscar Schatloff, Srinivas Samavedi, Camilo Giedelman Kenneth Palmer and Vipul R. Patel
Global Robotics Institute, University of Central Florida, School of Medicine, Orlando, USA

P6. From Bench To Bedside: The Novel Use Of 3D MRI For Image-Guided Robotic Prostatectomy
D.C.Cohen^1, A.N.Sridhar^1, P Pratt^2, B Khoubehi^3, J Vale^3, G-Z Yang^1, A Darzi^1, E.K.Mayer^3, P Edwards^1
^1Division of Surgery, Imperial College London
^2Hamlyn Centre for Robotic Surgery, Imperial College London
^3Department of Urology, Imperial College Healthcare Trust

P7. Bespoke Fixtures For Robotic Thyroidectomy
A. Arora^1, Z. Awad^1, N. Tolley^5, V. Luzzato^2, J. Ahn^2, F. Ostovari^2, M.
Oldfield^2, F. Rodriguez y Baena^2
^1 Department of Otolaryngology, St Mary’s Hospital, Imperial College Healthcare NHS Trust, London, UK
^2Department of Mechanical Engineering, Imperial College London, UK

P8. A Study Of Executive Control During Intracorporeal Minimally Invasive Suturing Using Functional Near Infrared Spectroscopy (fNIRS)
K. Shetty^1,2, D.R. Leff^1,2, F. Orihuela-Espina^1, A.W Darzi^1,2, G-Z. Yang^1
^1Hamlyn Centre for Robotic Surgery, Imperial College, London
^2Department of Surgery and Cancer

J. Liu, J. Correa, S. McKeague, E. Johns, C. Wong, A. Vicente, G.-Z. Yang
The Hamlyn Centre, Imperial College London

P10. Robotic NOTES: System Concept And Architecture
R. Kojcev^1, E. Wilson^1, K. Davenport^1, H. Luo^1, K. Gary^2, S. Oonk^3, K. Cleary^1
^1Sheikh Zayed Institute for Pediatric Surgical Innovation, Children’s National Medical Center, Washington, DC, USA
^2Department of Engineering, Arizona State University, Phoenix, Arizona, USA
^3American GNC Corporation, Simi Valley, California, USA

P11. Navigated Endoscopy: Prototype System For Robotically Assisted Ureteroscopy
C.A. Peters^1, A. Burns^1, E. Wilson^1, H. Luo^1, K. LeRoy^2, J. Goldie^2, B. LaBrecque^2, K. Cleary^1
^1Sheikh Zayed Institute for Pediatric Surgical Innovation, Children’s National Medical Center, Washington, DC, USA
^2Infoscitex Corporation, Boston, Massachusetts, USA

A. Montellano López^1, R. Richardson^1, A. Dehghani^1, R. Roshan^1, D. Jayne^2, A. Neville^1
^1School of Mechanical Engineering, University of Leeds, Leeds, United Kingdom
^2Academic Surgical Unit, St. James’s Hospital, University of Leeds, Leeds, United Kingdom
P13. A Feasibility Study On The Use Of Concentric Tube Continuum Robots For Endonasal Skull Base Tumor Removal
Hunter B. Gilbert1*, Philip J. Swaney1*, Jessica Burgner1, Kyle D. Weaver2
Paul T. Russell III2, and Robert J. Webster III1,2
1Mechanical Engineering, Vanderbilt University
2Vanderbilt University Medical Center
*Shared First Authorship

Ramon Sargeant, Hongbin Liu, Kaspar Althoefer
King’s College London, UK

P15. 2-DOF MR-Compatible Cardiac Catheter Steering Mechanism
A. Ataollahi, Y. L. Ma, T. Schaefter, K. Rhode, R. Razavi, L. Seneviratne,
and K. Althoefer
Engineering Department, King’s College London,
Rayne Institute, King’s College London

P16. Closed-Loop Position Control Of An MRI-Powered Biopsy Robot
Panagiotis Vartholomeos1, Christos Bergeles1, Lei Qin2 and Pierre E. Dupont1
1Childrens Hospital Boston, Harvard Medical School, Boston, MA USA
2Dana Farber Cancer Institute, Harvard Medical School, Boston, MA USA

P17. Clinical Study Of Prostate Tumour Identification Using A Rolling Indentor Robot
Jichun Li1, Hongbin Liu1, Jelizaveta Zirjakova1, Benjamin Challacombe2,
Prokar Dasgupta3, Lakmal D Seneviratne1, Kaspar Althoefer1
1Centre for Robotics Research, King’s College London,
2Departments of Urology and Histopathology, Guys and St Thomas Hospital,
3MRC Centre for Transplantation, NIHR Biomedical Research Centre, Guy’s Hospital
A.I. Skinner¹, K. Hohenberg¹, A. Pereira¹, S. Bowyer¹, Y. Tenzer², F. Rodriguez y Baena¹
¹Department of Mechanical Engineering, Imperial College London,

**P19. Extending The Reach And Stability Of Manually Steerable Neuroendoscopes Through Robotics**
Pierre E. Dupont¹, Szymon Chawarski², Evan J. Butler², Robert Hammond-Oakley², Andrew H. Gosline², Patrick Codd², Tomer Anor¹, Joseph R. Madsen¹ and Jesse Lock²
¹Children’s Hospital Boston, Harvard Medical School, Boston, MA USA,
²Sterling Point Research, Winchester, MA USA

12.45-14.30 Lunch Break and Poster Presentations

### Session 2: Image Guidance in Robotic Surgery

14.30-15.00 **Invited Lecture- Robots for cardiac intervention**
Professor Pierre Dupont
Professor in the Departments of Mechanical Engineering and Biomedical Engineering Boston University and Chief of Paediatric Cardiac Bioengineering at Boston Children’s Hospital.

15.00-15.15 **Target Tracking In 3D Ultrasound Volumes By Direct Visual Servoing**
C. Nadeau¹, H. Ren²,³, A. Krupa¹, P. Dupont²
¹IRISA, Inria Rennes-Bretagne Atlantique, France,
²Children’s Hospital Boston and Harvard Medical School, Boston, MA, USA
³Department of Bioengineering, National University of Singapore, Singapore

15.15-15.30 **Active Stabilization Of Ultrasound Image For Robotically-Assisted Medical Procedures**
C. Nadeau¹, A. Krupa¹, P. Moreira², N. Zemiti², P. Poignet², J. Gangloff³
15.30-15.45

**Left Atrium Surface Flattening For Assisting Guidance In Catheter Ablation Procedures**

Rashed Karim¹, Ying-Liang Ma¹, James Housden¹, Aruna Arujuna², C. A. Rinaldi¹,², Mark O’Neill¹,², Reza Razavi¹,², Tobias Schaeffter¹ and Kawal Rhode¹

¹Division of Imaging Sciences and Biomedical Engineering, Kings College London, UK
²Guy’s and St. Thomas’ Hospitals NHS Foundation Trust, London, UK

15.45-16.00

**Image-Guided Transoral Robotic Surgery For The Treatment Of Oropharyngeal Cancer**

Philip Pratt¹, Eddie Edwards², Asit Arora², Neil Tolley², Ara Darzi², Guang-Zhong Yang¹

¹Hamlyn Centre for Robotic Surgery, Imperial College London
²Department of Surgery and Cancer, Imperial College London

16.00-16.30

**Coffee Break and Poster Presentations**

**Session 3: Platform design and control**

16.30-17.00

**Key Note Speaker: Creative design of robotic mechanisms**

Professor Shigeo Hirose

Professor at the Tokyo Institute of Technology, Department of Mechanical and Aerospace Engineering

17.00-17.15

**Raven II™: Open Platform For Surgical Robotics Research**

H. Hawkeye King¹,⁴, Lei Cheng³, Philip Roan³, Diana Friedman¹, Sina Nia Kosari¹, Ji Ma³, Daniel Glozman³, Jacob Rosen², Blake Hannaford¹

¹University of Washington, Seattle, WA, USA
²University of California, Santa Cruz, CA, USA
17.15-17.30  **Robotic Control Of A Traditional Flexible Endoscope**  
J.G. Ruiter\textsuperscript{1,2}, G.M. Bonnema\textsuperscript{3}, M.C. van der Voort\textsuperscript{1}, I.A.M.J Broeders\textsuperscript{1,3}  
\textsuperscript{1} University of Twente, Enschede,  
\textsuperscript{2} DEMCON advanced mechatronics, Oldenzaal  
\textsuperscript{3} Meander Medical Centre, Amersfoort

17.30-17.45  **Micro Medical Robot with Magnetic Remote Control in 3D Space**  
M Yasui\textsuperscript{1}, M Ikeuchi\textsuperscript{2}, K Ikuta\textsuperscript{2}  
\textsuperscript{1}Graduate School of Frontier Biosciences, Osaka University,  
\textsuperscript{2}Research Center for Advanced Science and Technology, The University of Tokyo

17.45-18.00  **Lessons Learned Using The Insertable Robotic Effector Platform (IREP) For Single Port Access Surgery**  
N.Simaan\textsuperscript{1,2}, A. Bajo\textsuperscript{1,2}, A. Reiter\textsuperscript{3}, P. Allen\textsuperscript{3}, D. Fowler\textsuperscript{4}  
\textsuperscript{1}A.R.M.A. Laboratory, Dept. of Mechanical Engineering, Vanderbilt University,  
\textsuperscript{2}Vanderbilt Initiative for Surgery and Engineering (VISE)  
\textsuperscript{3}Dept. of Computer Science, Columbia University  
\textsuperscript{4}Dept. of Surgery, Columbia University

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**Dinner for Programme Committee Members**
**Hamlyn Symposium 2012**

Monday 2\textsuperscript{nd} July 2012

The Royal Geographical Society, 1 Kensington Gore, London, SW7 2AR

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<td>9.00 - 9.30</td>
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| 9.30 - 9.45| **Totally Endoscopic Robotic Parathyroidectomy Through A Lateral Cervical Approach**                    | S. Van Slycke\textsuperscript{1,2}, H. Maes\textsuperscript{1}, H. Vermeersch\textsuperscript{2}, N. Brusselaers\textsuperscript{3} | \textsuperscript{1}OLV Clinic Aalst, Belgium, Department of General and Endocrine Surgery  
\textsuperscript{2}Department of Head and Neck Surgery, University Hospital Ghent, Belgium  
\textsuperscript{3}Department of Internal and General Medicine, University Hospital Ghent, Belgium |
| 9.45 - 10.00 | **A Pilot Ex-Vivo Evaluation Of A Telerobotic System For Transurethral Intervention And Surveillance** | A. Bajo\textsuperscript{1,3}, R. B. Pickens\textsuperscript{2}, S. D. Herrell\textsuperscript{2,3}, N. Simaan\textsuperscript{1,3} | \textsuperscript{1}A.R.M.A. Laboratory, Dept. of Mechanical Engineering, Vanderbilt University  
\textsuperscript{2}Dept. of Urologic Surgery, Vanderbilt University Medical Center  
\textsuperscript{3}Vanderbilt Initiative for Surgery and Engineering (VISE) |
| 10.00 - 10.15 | **Initial Experience With Robotic Partial Nephrectomy (RPN): A Collaborative Approach Drawing On Different Backgrounds** | A. Patel\textsuperscript{1}, C. Oliver\textsuperscript{1}, M. Billia\textsuperscript{1}, G. Kooiman\textsuperscript{2}, P. Dasgupta\textsuperscript{1}, T.S. O’Brien\textsuperscript{1}, B. Challacombe\textsuperscript{1}. | \textsuperscript{1}Urology Centre, Guy’s and St Thomas’ NHS Foundation Trust, London.  
\textsuperscript{2}Department of Urology, King’s College Hospital, London. |
| 10.15 - 10.30 | **Robotic Tele-Manipulating Devices For Laparoscopy Improve Surgical**                                   |                                                                         |                                                                              |
Performance In Simulated Porcine Laparoscopic Cholecystectomies On The ELITE Simulator When Compared To Surgical Assistants
K Sriskandarajah\textsuperscript{1}, S Gillen\textsuperscript{2}, A Di Marco\textsuperscript{2}, M Sodergren\textsuperscript{1}, DRC James\textsuperscript{1}, J Clark\textsuperscript{1}, HD Feussner\textsuperscript{2}, A Darzi\textsuperscript{1}, GZ Yang\textsuperscript{1}
\textsuperscript{1}Hamlyn Centre for Robotic Surgery & Global Health Innovation, Imperial College London
\textsuperscript{2}Department of Surgery, Klinikum rechts der Isar, Technische Universität der TUM, Munich

10.30-11.00 Coffee Break and Poster Presentations

11.00-11.45 Poster Teasers Session 2 (3 minute presentations)

P20. New Evaluation Metrics Applied To Robotic Anastomosis
Abdelaziz Farhat\textsuperscript{3}, Mohammed Al-Haddad\textsuperscript{4}, Georges Younes\textsuperscript{1,2}, Tarek El-Ghazaly\textsuperscript{3,5}, Julien Abi-Nahed\textsuperscript{1}, Abdulla Al-Ansari\textsuperscript{1,5}, George Turkiyyah\textsuperscript{2}
\textsuperscript{1}Qatar Robotic Surgery Centre
\textsuperscript{2}American University of Beirut
\textsuperscript{3}Weill Cornell Medical College in Qatar
\textsuperscript{4}Carnegie Mellon University in Qatar
\textsuperscript{5}Hamad Medical Corporation

P21. Skill Assessment With Proximal Force Sensing For Endovascular Catheterisation
H. Rafii-Tari\textsuperscript{1}, C.J. Payne\textsuperscript{1}, C. Riga\textsuperscript{2}, C. Bicknell\textsuperscript{2}, S.L. Lee\textsuperscript{3}, G.Z. Yang\textsuperscript{1}
\textsuperscript{1}The Hamlyn Centre for Robotic Surgery, Imperial College London, UK
\textsuperscript{2}Academic Division of Surgery, Imperial College London, UK

P22. Surgtrak: Synchronized Performance Data Capture For The Da Vinci Surgical Robot
L. W. White\textsuperscript{1}, T. M. Kowalewski\textsuperscript{2}, B. H. Hannaford\textsuperscript{2}, T.S. Lendvay\textsuperscript{3}
\textsuperscript{1}BioEngineering Department, University of Washington, USA
\textsuperscript{2}Electrical Engineering Department, University of Washington, USA
\textsuperscript{3}Department of Urology, University of Washington, USA

P23. Minimally Invasive Surgical Skill Assessment By Video-Motion Analysis
Seung-kook Jun\textsuperscript{1}, Madusudanan Sathia Narayanan\textsuperscript{1}, Abeer Eddib MD\textsuperscript{2},
Pankaj Singhal MD¹, Sudha Garimella MD², Venkat Krovi PhD¹
¹University at Buffalo, SUNY, Buffalo NY 14260
²Kaleida Health System, Buffalo, NY 14221 USA

**P24**  
Eye-Tracked Vergence Response During Active-Stereo Display  
A. T. Duchowski¹, B. Pelfrey¹, D. H. House¹, R. Wang¹  
¹School of Computing, Clemson University

**P25.**  
Intraoperative Analysis Of Locations For 3D Ultrasound-Guided Capture Of Foreign Bodies From A Beating Heart  
Paul Thienphrapa¹,², Bharat Ramachandran², Haytham Elhawary³, Aleksandra Popovic³, Russell H. Taylor¹  
¹ERC CISST/LCSR, Johns Hopkins University  
²Philips Research North America

**P26.**  
Fusion Of Visual And Inertial Measurements For 3D Tissue Reconstruction In Minimally Invasive Surgery  
Stamatia Giannarou, Zhiqiang Zhang and Guang-Zhong Yang  
Hamlyn Centre for Robotic Surgery, Imperial College London

**P27.**  
A Snapshot Endoscopic Polarisation Imaging System  
N.T. Clancy¹,² and D. S. Elson¹,²  
¹Hamlyn Centre for Robotic Surgery, Imperial College London, UK  
²Department of Surgery and Cancer, Imperial College London, UK

**P28.**  
Quantitative Tissue Measurements In Transoral Robotic Surgery  
D. Stoyanov¹, P. Pratt², E. Edwards², G.-Z. Yang², A. Arora³, A. Darzi²,³, N. Tolley³  
¹Center for Medical Image Computing, University College London  
²Hamlyn Centre for Robotic Surgery, Imperial College London  
³St. Mary’s Hospital, Imperial College Healthcare NHS Trust

11.45-13.45  
Lunch Break and Poster Presentations

Session 5: Planning and Navigation
13.45-14.15 Invited Lecture- Snake robots and motion planning framework
Professor Howie Choset
Professor of Robotics at Carnegie Mellon University

14.15-14.30 Improved Visualisation With Shape Instantiation For Robot Assisted Catheter Navigation
Su-Lin Lee¹, Ka-Wai Kwok¹, Celia Riga², Colin Bicknell², and Guang-Zhong Yang¹
¹Hamlyn Centre for Robotic Surgery, Imperial College London, UK, ²Academic Division of Surgery, Imperial College London, UK

Hinitt A¹, Sobhani M¹, Dogramadzi S¹, Raabe D², Atkins R³
¹Bristol Robotics Laboratory, University of the West of England, UK ²Berufsakademie Sachsen, University of Cooperative Education, Germany ³Bristol Royal Infirmary, University Hospitals Bristol, UK

14.45-15.00 Laser Ablation System For Remained Brain Tumor Based On Protoporphyrin Fluorescence Spectrum
Takehiro Ando¹, Junki Koike¹, Kousuke Mizumura¹, Etsuko Kobayashi¹, Hongen Liao¹, Takashi Maruyama², Yoshihiro Muragaki², Hiroshi Iseki² and Ichiro Sakuma²
¹Graduate School of Engineering, The University of Tokyo ²Faculty of Advanced Techno-Surgery, Tokyo Women's Medical University

15.00-15.15 Toward Intraoperative Image-Guided Transoral Robotic Surgery
W. P. Liu¹, S. Reaugamornrat¹, A. Deguet¹, J. M. Sorger⁴, J. H. Siewersden¹,² J. Richmon², R. H. Taylor¹,²
Departments of ¹Computer Science, ²Otolaryngology-Head and Neck Surgery, ³Biomedical Engineering, Johns Hopkins University, Baltimore, USA ⁴Intuitive Surgical Inc., Sunnyvale, USA

15.15-15.45 Coffee Break and Poster Presentations
Session 6: Haptics and Perceptual Feedback

15.45-16.00
Introduction to the Inaugural Karl Storz Harold Hopkins Lecture- Kelvin Hopkins MP

16.00-16.30
Inaugural Karl Storz Harold Hopkins lecture: Developing next generation robots
Professor Richard Satava
Professor of Surgery at the University of Washington Medical Centre and Senior Science Advisor at the US Army Medical Research and Materiel Command in Ft. Detrick, MD

16.30-16.45
The Role Of Haptics In Robotics-Assisted Mitral Valve Annuloplasty
Maria E. Currie, MD, Ali Talasaz, PhD, Ana Luisa Trejos, MASC, Reiza Rayman, MD, PhD, Michael W.A. Chu, MD, MEd, Bob Kiaii, MD, Terry Peters, PhD, Rajni Patel, PhD
1Division of Cardiac Surgery, Department of Surgery, London Health Sciences Centre, London, Ontario, Canada
2Dept. of Elect. & Comp. Engineering, Western University, London, Ontario, Canada
3Canadian Surgical Technologies & Advanced Robotics, Lawson Health Research Institute, London, Ontario
4Dept. of Surgery, Schulich School of Medicine & Dentistry, Western University, Canada
5Medical Imaging Laboratory, Robarts Research Institute, Western University, Canada

16.45-17.00
Vibrotactile Perception For Haptics In Virtual Reality Surgical Training
T. Martin, C. W. Schwingshackl, M. J. Oldfield, F. Rodriguez y Baena
Department of Mechanical Engineering, Imperial College London, UK

17.00-17.15
Surgical Instrument Vibrations Are A Construct-Valid Measure Of Technical Skill In Robotic Peg Transfer And Suturing Tasks
17.15-17.30  **Air-Float Stiffness Probe For Tissue Abnormality Identification In Soft Tissue Palpation**  
I.B. Wanninayake, K. Althoefer, L.D. Seneviratne  
Centre for Robotic Research, Kings College London

17.30-18.00  **Closing Remarks and Awards**

18.00  **Drinks reception**