**Sunday 23rd June 2013**

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| **08:45** | **Registration and Coffee** |

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| **09:15** | **Welcome and Introduction** |

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| | **Session 1 - Platform Design** |

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| **09:30** | **Invited lecture - Robert D. Howe, Harvard University** |

**10:15**  **Design of a Bone-Attached Robot for Mastoidectomy**
N.P. Dillon*, R.J. Webster, T. J. Withrow
*Vanderbilt University, USA*

**10:30**  **Achieving Biocompatibility in Soft Sensors for Surgical Robots**
A. Gosline*, V. Arabagi , A. Kassam, P.E. DuPont
*Boston Children's Hospital, Harvard Medical School, USA*

**10:45**  **3D Ultrasound-Guided Retrieval of Foreign Bodies from a Beating Heart using a Dextrous Surgical Robot**
P. Thienphrapa*[1], A. Popovic[2], R. H. Taylor[1],
[1]*Johns Hopkins University, USA*
[2]*Philips Research North America, USA*

**11:00**  **Virtobot-Robot System in Forensic Medicine**
W. Ptacek[1], L. Ebert[2], M. Fürst[1], R. Breitbeck[2], M. Thali[2], G. Kronreif*[1]
[1] *Austrian Centre for Medical Innovation and Technology Integrated Microsystems Austria GmbH, Austria*
[2]*Institute of Forensic Medicine, University of Zurich, Switzerland*

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| **11:15** | **Coffee Break** |

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| **11:45** | **Poster Teasers Session 1 (3 minute presentations)** |

P1  **ASTRO: A Novel Robotic Tool for Laser Surgery of the Prostate**
S. Russo, P. Dario, A. Menciassi
*The Biorobotics Institute, Scuola Superiore Sant'Anna, Italy*

P2  **Improvement of Target Registration Accuracy with Anatomical Landmarks**
J. Chien[1], J. Park[2], S. Jeon[1], J. Hong*[1]
[1] *Daegu Gyeongbuk Institute of Science and Technology, Korea*
[2]*Kyungpook National University, Medical Device and Robot Institute of Park, Korea*

**P3** **A Low Cost System for 3D Position and Orientation Sensing**

K. O'Donoghue*, P. Cantillon-Murphy
*University College Cork, Ireland*

**P4** **Accurate Dense Feature Matching in Endoscopic Videos**

G.-L. Mariottini, G.A. Puerto-Souza*
*University of Texas at Arlington, USA*

**P5** **Multimodal Reconstruction for Image-Guided Interventions**

P. Pratt*, A. Hughes-Hallett, A. di Marco, T.P. Cundy, E. Mayer, J. Vale, A. Darzi, G.-Z. Yang
*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*

**P6** **Towards an Ontology for Orthopaedic Surgery, Application to Hip Resurfacing**

P. Goncalves*
*Polytechnic Institute of Castelo Branco, Portugal*

**P7** **Ex-Vivo Robotic Trials for Thyroidectomy with Novel Retraction**

A. Arora*[1], N. Tolley[1], Z. Awad[2]; V. Luzzato[2], M. Oldfield[2], F. Rodriguez y Baena[2]
[1]*St Mary's Hospital, Imperial College Healthcare NHS Trust, UK*
[2]*Department of Mechanical Engineering, Imperial College London, UK*

**P8** **Automated Cognitive Load Detection with Electroencephalography: Towards Brain-Computer Interfacing in Robotic Surgery**

K. Shetty[1]*, T. Zander[2], D.R. Leff[1], R. Lorenz[2], G.-Z. Yang[1], A. Darzi[1]
[1]*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*
[2]*Team PhyPA, TU Berlin, Germany*

**P9** **Vibration-Induced Frictional Reduction for Magnetically Guided Intracorporeal Devices**

M. Sfakiotakis[1,2]*, N. Pateromichelakis[1], D.P. Tsakiris[1]
[1]*Institute of Computer Science, Foundation for Research and Technology, Greece*
[2]*Technological Educational Institute of Crete, Greece*

**P10** **Multispectral Imaging using a Fast Filter Wheel System during Vascular Surgery**

N.T. Clancy*[1, 2], M. Ebner[3], J.S. Crane[2], R. Corbett[4], N. Duncan[4], C. Caro[5], D.S. Elson[1,2]
[1]*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*
[2]*Dept. Surgery and Cancer, Imperial College London, UK*
[3]*Karl-Storz GmbH & Co., Tuttlingen, Germany*
[4]*Dept. of Medicine, Imperial College London, UK*
[5]*Dept. of Bioengineering, Imperial College London, UK*

**P11** **Surgical Instrument Forces Exerted during Robot-Assisted Neurosurgery: A Cadaver Study**

H.J. Marcus*[1], K. Zareinia[2], L.S. Gan[2], F. Yang[2], S. Lama[2], G.-Z. Yang[1], G. Sutherland[2]
[1]*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*
[2]*Dept. of Clinical Neurosciences, University of Calgary, Canada*

**P12    New Solution for Solid-Organ Resection Based on a Compact MIS Robot**

J.M. Li[1], N.X. Zhou[2], L.A. Zhang[1], Y. Chen[1], S.X. Wang[1]*
[1]*Tianjin University, China*
[2]*Hepatobiliary Gastroenterology Institute, Beijing, China*


**P13    A Fault Analysis Procedure for Surgical Robotic Systems**

M. Capiluppi*[2], L. Schreiter[1], P. Fiorini[2], J. Raczkowsky[1], H. Woern[1]
[1]*Karlsruhe Institute of Technology, Germany*
[2]*University of Verona, Italy*


**P14    Real-Time Visual Stiffness Feedback for Soft Tissue Palpation in a Telemanipulation Environment**

M. Li*, J. Konstantinova, V. Aminzadeh, T. Nanayakkara, L.D. Seneviratne, P. Dasgupta, K. Althoefer
*King's College London, UK*


**P15    Detection and Identification of Multispectral Structured Light Patterns for Minimally Invasive Surgery**

J. Lin*, N.T. Clancy, G. Boissonnat, D.S. Elson
*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*


**P16    Hand Exoskeleton for Remote Control of Minimally Invasive Surgical Anthropomorphic Instrumentation**

A. Tzemanaki[1,2]*, X. Gao[2], A. Pipe[1,2], C. Melhuish[1], S. Dogramadzi[1,2]
[1]*Bristol Robotics Laboratory, UK*
[2]*University of the West of England, UK*


**P17    Embedded Middleware and Hard Real-Time Based Architecture for Robot Assisted Ophthalmic Surgery**

S. Nair, M. Ali Nasseri*, M. Eder, C.P.  Lohmann, A. Knoll
*TU München, Germany*


**P18    Application of Robot-Assisted Laparoscopic Surgery in Paediatric Urology – A Seven-Year Single Surgeon Experience**

T.P. Cundy*[1], N.E. Gattas[2], S.M. Whiteley[2], A. Springer[2], A.S. Najmaldin[2]
[1]*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*
[2]*Dept. of Paediatric Surgery, Leeds General Infirmary, UK*


**P19    Case-Specific Rehearsal Using a Temporal Bone Simulator: Is It Feasible and Clinically Applicable?**

A. Arora*,C. Swords, S. Khemani,  Z. Awad, A. Darzi,  A. Singh, N. Tolley
*St Mary's Hospital, Imperial College London, UK*


**12:45          Lunch**

## Session 2 - Image Guidance In Robotic Surgery

**14:30**      **Invited Lecture - Reiza Rayman, Titan Medical Inc**

**15:15**      **Robotic, Registered, Transrectal Ultrasound Guidance during da Vinci Radical Prostatectomy: Initial Clinical Experience**
O. Mohareri*, J. Ischia, C. Schneider, P. Black, S.E. Salcudean
*University of British Columbia, Canada*

**15:30**      **Backlash Compensation Method for Wire Drive Forceps Mechanism under Various Loading Conditions**
I. Sakuma *, Y. Tsukahara, T. Ando, H. Liao, E. Kobayashi
*School of Engineering, The University of Tokyo, Japan*

**15:45**      **A Dexterous Instrument for Minimally Invasive Neurosurgery**

F. Khan*, B. Carrillo, T. Looi, J. Drake
*The Hospital for Sick Children, Toronto, Canada*

**16:00**      **Image Guided and Robotic Assisted Minimally Invasive Cochlear Implantation**
S. Weber, N. Gerber, K. Gavaghan*, T. Willamson, W. Wimmer, J. Ansó, L. Salas-Brogna, D. Chen, C. Weistanner, M. Caversaccio, B. Bell
*ARTORG Center for Biomedical Engineering, University of Bern, Germany*

**16:15**      **Coffee Break**

## Session 3 - Training and Clinical Outcomes

**16:45**      **A Filtering Approach for Surgical Registration with Unknown Stiffness**
S. Tully*[1], A. Bajo[2], N. Simaan[2], H. Choset[1]
[1]*Carnegie Mellon University, USA*
[2]*Vanderbilt University, USA*

**17:00**      **Per-Oral Endoscopic Cardiomyotomy and Pyloromyotomy using a Flexible Snake Robot – Proof of Concept with a Porcine Model**

T.P. Cundy*, N.K. Patel, J. Shang, C.A. Seneci, C.J. Payne, V. Vitiello, J. Clark, J.P. Teare , A. Darzi, G.-Z. Yang
*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*

**17:15**      **Mechanical Drive System for Enhancing Flexible Endoscopy: System Concept and Prototype Development**
L. Zhang[1,2], R. Khare[1], E.Wilson[1], A. Martin[1], K. Wu[1], K. Swords[1], K. Cleary[1]*, C.A. Peters[1]
[1]*The Sheikh Zayed Institute, Washington, USA*
[2]*Tianjin University, Tianjin, China*

**17:30**          **SINGER: A Virtual Simulator for Robotic Neurosurgery**

M. Niccolini*[1], C. Diversi[1,2], B. Kang[1,2], V. Catelli[1,2], B. Mazzolai[1], E. Sinibaldi[1]
[1]*Centre for Micro-biorobotics, Istituto Italiano di Tecnologia, Italy*
[2]*The Biorobotics Institute, Scuola Superiore Sant'Anna, Italy*


**18:00**          **Dinner for Programme Committee Members**

**Monday 24th June**

| 08:45 | **Registration and Coffee** |

| | **Session 4 - New Clinical Approaches and Pilot Studies** |

| 09:15 | **Keynote Lecture: Gary Guthart, Intuitive Surgical -** *The daVinci System at 14: Clinical Overview, Economics and Opportunities* |

| 10:00 | **Trans-Nasal Robotic Micro-Surgery of the Throat: A Cadaveric Feasibility Study** |

A. Bajo, L.M. Dharamsi, J. Netterville, C.G. Garrett, N. Simaan*
*Vanderbilt University, USA*

| 10:15 | **Implanted Miniature Engineering Mechanisms in Tendon-Transfer Surgery Improve Robustness of Post-Surgery Hand Function** |

R. Balasubramanian[1]*, J. Montgomery[1], K. Mardula[1], C. Allan[2]
[1]*Oregon State University*
[2]*University of Washington*

| 10:30 | **First Evaluations in the Control of a Novel Flexible Surgical Robot** |

A. De Donno*, L. Zorn, P. Zanne, F. Nageotte, M. de Mathelin
*University of Strasbourg, CNRS, France*

| 10:45 | **Nanoparticle Ferrofluids for Tissue Manipulations in Minimal Access Surgery** |

Y.S. Lin*, R. Roshan, P. Culmer,  T. Liskiewicz, A. Neville
 *iETSI, University of Leeds, UK*

| 11:00 | **Coffee Break** |

| 11:30 | **Poster Teasers – Part 2** |

| P20 | **Development of Robot-Assisted Surgery in Qatar** |

O. Al-Alao*[1], J.-M. Peyrat[2], J. Abi-Nahed[2], A. Al-Ansari[1,2]
[1]*Hamad Medical Corporation, Qatar*
[2]*Qatar Robotic Surgery Centre, QSTP, Qatar*

| P21 | **Operative Working Spaces in Keyhole Neurosurgery: An MRI Study** |

H.J. Marcus*[1], A. Hughes-Hallett[1], P. Pratt[1], J. Clark[1], D. Nandi[2], A. Darzi[1], G.-Z. Yang[1]
[1]*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*
[2]*Dept. of Neurosurgery, Imperial College Healthcare NHS Trust, UK*

| P22 | **Developing a Training Tool for Intraoperative Mitral Valve Analysis** |

N.A. Tenenholtz*, R.D. Howe
*School of Engineering and Applied Sciences, Harvard University, USA*

P23     **Anatomical Neck Dissection for Real Time Intraoperative In-Vivo In-Situ Soft Tissue Morphology Characterisation using Confocal Endomicroscopy**

T.-P. Chang*, K. Sriskandarajah, T.P. Cundy, D.R. Leff, R. C. Newton, H. J. Marcus, A. Darzi, G.-Z. Yang
*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*

P24     **Pre-clinical Validation and Assessment of an Innovative Bi-Manual Surgical Robot for Single-Port Laparoscopy**

G. Petroni*, M. Niccolini, S. Tognarelli, C. Quaglia, S. Caccavaro, A. Menciassi, P. Dario
*The Biorobotics Institute, Scuola Superiore Sant'Anna, Italy*

P25     **Image Guidance Framework with Endoscopic Video for Automated Robotic Anastomosis in a Paediatric Setting**

T. Looi*[1], B. Yeung[2], M. Umasuthan[2], J.M. Drake[1]
*[1]The Hospital for Sick Children, Toronto, Canada*
*[2]MDA Corporation, Brampton, Canada*

P26     **Robotic Thyroidectomy: A Prospective Case Control Study**

A. Arora*, S. Sharma, K. Muthuswamy,  Z. Awad, A. Darzi, F. Palazzo, N.Tolley
*St Mary's Hospital, Imperial College Healthcare NHS Trust, UK*

P27     **Design and FEM Simulation of a Miniaturised Wristed Surgical Grasper**

C.A. Seneci*, J. Shang, G.-Z. Yang
*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*

P28     **A Bio-Galvanic Approach to Tissue Characterisation: Technological Considerations**

J.H. Chandler*[1], A. Hood, P.R. Culmer[1], D. Jayne[2], A. Neville[1],
*[1]School of Mechanical Engineering, University of Leeds, UK*
*[2]Leeds Academic Surgical Unit, St James' University Hospital, UK*

P29     **Gesture Based Gaze Contingent Control of a Robotic Arm for Laparoscopic Applications**

K. Fujii*, A. Salerno, K. Sriskandarajah, K.-W. Kwok, G.-Z. Yang
*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*

P30     **Video-Based Framework for Safer and Smarter Computer Aided Surgery**

S. Kumar[1], M.S. Narayanan*[2], S. Misra, S. Garimella[1], P. Singha[1], J.J. Corso[1], V. Krovi[1]
*[1]University at Buffalo (SUNY), USA*
*[2]ARMLAB SUNY Buffalo, USA*

P31     **Performance and Eye Behaviour Changes  Associated with Visuomotor Rotation – Relevance for Design of Robotic Telemanipulators**

K. Sriskandarajah*, K. Shetty, M. Sodergren, G.-Z. Yang, A. Darzi
*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*

**P32**    **Compact Modular System for Teleoperated Laparoendoscopic Single Site Surgery**

O. Isaac-Lowry*, S. Okamoto, P. Berkelman

*Dept. of Mechanical Engineering, University of Hawaii-Mano, USA*


**P33**    **Accuracy of an MRI-Compatible Pneumatic Active Cannula Robot**

D.B. Comber, E.J. Barth*, R.J Webster III, J.S. Neimat

*Vanderbilt University Medical Centre, USA*


**P34**    **5-DOF Manipulation of a Magnetic Capsule in Fluid using a Single Permanent Magnet: Proof-of-Concept for Stomach Endoscopy**

A.W. Mahoney*, J.J. Abbott

*University of Utah, USA*


**P35**    **Endoscopic Submucosal Dissection for Gastric Lesions using a Flexible Snake Robot – Early Assessment and Feasibility Study**

N.K. Patel*, T.P. Cundy, J. Shang, C.J. Payne, C.A. Seneci, V. Vitiello, J. Clark, J. Teare , A. Darzi, G.-Z. Yang

*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*


**P36**    **Patient Mounted CT and MRI Compatible Shoulder Arthrography Robot for Needle Guidance in Paediatric Interventional Procedures**

R. Monfaredi[1,2], R. Sze[1], N. Safdar[1], K. Sharma[1], K. Cleary[1]*

[1]*The Sheikh Zayed Institute, Washington, USA*
[2]*Azad University, Tehran, Iran*


**P37**    **A Novel Three-Dimensional Stereoscopic Viewer for Transanal Endoscopic Microsurgery: A Report of Two Clinical Cases**

A. di Marco*, P. Pratt, G.-Z.Yang, A. Darzi

*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*


**P38**    **The Core-Snake, the Variable Stiffness Laparoscopic Camera**

A. Jiang*, K. Althoefer, P. Dasgupta, T. Nanayakkara

*King's College London, UK*


**12:30**          **Lunch**


**14:00**          **Panel Discussion**


**Session 5 - Intraoperative Tissue Tracking and Characterisation**


**14:45**          **Brain Surface Tissue Deformation Tracking in Craniotomies**

R. Vivanti[1], O. Sadowsky[1], M. Shoham[2], L. Joskowicz*[1],

[1]*School of Engineering and Computer Science, The Hebrew University of Jerusalem, Israel*
[2]*Faculty of Mechanical Eng. Technion, Israel Institute of Technology, Haifa, Israel*

**15:00**       **Towards an Endoscopic Device for Laser-Assisted Phonomicrosurgery**

D. Kundrat*, A. Schoob, B. Munske, T. Ortmaier

*Institute of Mechatronic Systems, Leibniz Universitat, Hannover, Germany*

**15:15**       **An Ultrasound-Based Methodology for Endoluminal Robot Tracking in Cardiovascular Procedures**

M. Mura, G. Ciuti, P. Dario, A. Menciassi*

*The BioRobotics Institute, Scuola Superiore Sant'Anna, Italy*

**15:30**       **Salient Features of Soft Tissue Examination Velocity during Manual Palpation**

J. Konstantinova*, K. Althoefer, P. Dasgupta, T. Nanayakkara

*King's College London, UK*

**15:45**       **Coffee Break**

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| | **Session 6 - Perceptual Docking** |

**16:15**       **Hopkins Lecture Ferdinand Köckerling, Vivantes, Germany  - *Robotics in Bariatric Surgery***

**17:00**       **Robotic Steering of Cardiac Ultrasound Imaging Catheters**

L.J. Brattain[1,2], P.M. Loschak*[1], C.M. Tschabrunn[3], E. Anter[3], R.D. Howe[1]

[1]*Harvard SEAS, USA*
[2]*MIT Lincoln Laboratory, USA*
[3]*Beth Israel Deaconess Medical Center, Harvard Medical School, USA*

**17:15**       **Collaborative Robot-Assisted Endovascular Catheter Navigation using Learned Models**

H. Rafii-Tari*, J. Liu, S.-L. Lee, G.-Z.Yang

*The Hamlyn Centre for Robotic Surgery, Imperial College London, UK*

**17:30**       **Workspace Analysis and Calibration Method for Mobile Image Overlay System used for Image-Guided Interventions**

M. Anand*[1], T. Ungi[1], T.A. Lasso[1], P.U. Thainual[1], J. Jayender[2], J. Fritz[3], J.A. Carrino[3], F.Jolesz[2], G. Fichtinger[1,3]

[1]*Queen's University, Canada*
[2]*Harvard Brigham and Women's Hospital, USA*
[3]*Johns Hopkins University, USA*

**17:45**       **Smooth Active Constraints Employed for Position and Force Control in Robot Assisted Surgery**

A. Proesch, S. Bowyer, F.  Rodriguez y Baena*

*Dept. of Mechanical Engineering, Imperial College London, UK*

**18:00**       **Closing Remarks & Awards followed by Drinks Reception**