

Mathematical Challenges in Ophthalmology

Thursday January 16, 2014

- 8:00–8:55 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:55–9:00 *Welcome and Opening Remarks*
- 9:00 *Robotic Session (Chairs: TC Tsao and JP Hubschman, UCLA)*
- 9:00–9:20 **Erik Dutson** (University of California, Los Angeles (UCLA))
Past, present and future of Robotic surgery
- 9:20–9:40 **Jean-Pierre Hubschman** (University of California, Los Angeles (UCLA))
Robotic Surgery in Ophthalmology
- 9:40–10:20 **Russell Taylor** (Johns Hopkins University)
A Microsurgery Assistant System for Retinal Surgery
- 10:40–11:10 *Break*
- 11:10–11:50 **Tsu-Chin "T.C." Tsao** (University of California, Los Angeles (UCLA))
The IRISS Platform
- 11:50–12:30 **Stefano Soatto** (University of California, Los Angeles (UCLA))
Overview of 3D Motion estimation and reconstruction from video streams (presented with Jonathan Balzer, UCLA)
- 12:30–12:40 *Discussion*
- 12:40–2:00 *Lunch (on your own)*
- 2:00 *Imaging Session 1 (Chairs: Emanuele Trucco and Irena Tsui, UCLA)*
- 2:00–2:20 **Irena Tsui** (University of California, Los Angeles (UCLA))
Ultra Wide Field Retinal Angiography
- 2:20–3:00 **Emanuele Trucco** (University of Dundee)
Automatic retinal image processing: the VAMPIRE project
- 3:00–3:30 **Zachary Taylor** (University of California, Los Angeles (UCLA))
The THz Laser
- 3:30–4:00 *Break*
- 4:00–4:20 **James Gibson** (University of California, Los Angeles (UCLA))
Adaptive Optics and Beam Steering for Disturbance Rejection and Target Tracking
- 4:20–4:50 **Bruno Uzzan** (Total Immersion)
Augmented reality: market and applications
- 4:50–5:10 *Discussion*
- 5:10–6:30 *Reception (Location: IPAM Lobby)*



Friday January 17, 2014

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Imaging Session 2 (Chairs: Emanuele Trucco and Irena Tsui, UCLA)*
- 9:00–9:20 **Kouros Nouri-Mahdavi** (University of California, Los Angeles (UCLA))
SD-OCT imaging in glaucoma: challenges and unmet needs
- 9:20–9:40 **Warren Grundfest** (University of California, Los Angeles (UCLA))
Spatiotemporal imaging spectroscopy: extraction of lifetime contrast information without the need for lifetime deconvolution
- 9:40–10:00 **Steven Schwartz** (University of California, Los Angeles (UCLA))
Adaptive Optics and Retinal Evaluation
- 10:00–10:10 *Discussion*
- 10:01 *Simulation Session (Chair: Joseph Teran, UCLA)*
- 10:10–10:50 **Suvranu De** (Rensselaer Polytechnic Institute)
Virtual Surgery
- 10:50–11:00 *Discussion*
- 11:00–11:20 *Break*
- 11:20–12:00 **Joseph Teran** (University of California, Los Angeles (UCLA))
Simulation in real-time: virtual surgery
- 12:00–12:40 **Jeff Eldredge** (University of California, Los Angeles (UCLA))
Numerical simulations of the mechanics of vitrectomy
- 12:40–12:50 *Discussion*
- 12:50–2:00 *Lunch (on your own)*
- 2:00–2:40 **Jernej Barbic** (University of Southern California (USC))
Vega FEM library for nonlinear solid deformable object simulation
- 2:40–3:00 **Pirouz Kavehpour** (University of California, Los Angeles (UCLA))
Biomechanics of Vitreous Gel
- 3:00–3:15 *Discussion*
- 3:15–3:45 *Discussion Break in Lobby and Conclusion of the Day*

Saturday January 18, 2014

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Vision and Optics Session (Chairs: Michael Gorin and Jean-Pierre Hubschman, UCLA)*
- 9:00–9:40 **Pablo Artal** (University of Murcia)
The human eye as a robust optics system
- 9:40–10:20 **Rich Braun** (University of Delaware)
Models for Tear Film Dynamics
- 10:20–10:30 *Discussion*
- 10:30–10:50 *Break*
- 10:50–11:10 **Michael Gorin** (UCLA Medical School)
Mathematical modeling for hereditary eye disorders: Challenges and Opportunities
- 11:10–11:50 **Eli Peli** (Harvard Medical School)
Challenges in Vision Rehabilitation: Computational Simulations of Impaired Vision
- 11:50–12:10 *Discussion (turn page>>)*
- 12:10 *Saturday, January 18, 2014 (Continued)*
- 12:10–2:00 *Lunch (on your own)*
- 2:00–2:20 **Rex Hamilton** (University of California, Los Angeles (UCLA))
Femtosecond Laser in Ophthalmology
- 2:20–2:30 *Discussion*
- 2:30–2:50 **Vladimir Feingold** (Presbia, Inc.)
Implants for the treatment of Presbyopia
- 2:50–3:30 **Sergio Barbero** (Consejo Superior de Investigaciones Científicas (CSIC))
Power-adjustable optical systems for optometry applications (work with Jacob Rubenstein)
- 3:30–3:45 *Discussion and Program Conclusion*

