



# KOÇ UNIVERSITY

## Optical Microsystems Laboratory (OML)

OML UPDATE, ISSUE NO:3

FEBRUARY 2010



**OML Director Hakan Ürey joined Koc University in 2001 and currently an Associate Professor of Electrical Engineering. He has 22 US and European patents, 30 SCI journal papers, 310 Citations, >100 conference papers with many invited talks, 8 edited books, 2 book chapters, 4 awards and chaired several international conferences.**

### PROJECTS:

**MID-IR  
SPECTROMETER  
LASER 3DTV**

**2D/3D  
DISPLAYS**

**THERMAL  
IMAGING**

**BIOSENSORS**

**MOEMS SCANNERS**

## OML RESEARCH ON DISPLAY

OML Research has been showcased during a number of events and visits held in recent months.

OML Director has been invited to present the research highlights during a meeting of the Koc University Board of Trustees held in October 2009.

In November 2009 OML researchers participated in the annual industrial innovation congress which was organized by Istanbul Chamber of Commerce.



**Photo showing samples of OML research prototypes (above), Koç University Booth at the 2009 Innovation Congress organized by Istanbul Chamber of Commerce (below), Turkish Cabinet Ministers during their visit to Koç booth (left).**



In February 2010, OML Director presented OML research highlights during a gathering of senior directors and ministers from Turkish government and private sector companies at the 2009 Sinerjiturk Congress held in Antalya, Turkey. Subsequently, a high level of delegation from one of the major research funding authorities of the Turkish government visited OML as part of their visit to Koç University Research Laboratories.



OML was represented at the FP7 Concertation Meeting of Photonics sector in Athens, Greece during September 2009, at the Photonics21 Meetings in Brussels during January 2010, and at the FP7 MNBS (Micro-Nano-Bio Convergence Systems) workshop in Switzerland during February 2010.

# OML JAM SESSION (2009) HELD

## DIRECTOR

Assoc. Prof. Hakan Ürey

## PROJ. MANAGER

Dr. Zafer Ürey

## RESEARCHERS

Mr. Sven Holstrom  
Mr. Selim Ölçer  
Dr. Kishore Chellappan  
Dr. Jaibir Sharma

## PhD/MS STUDENTS

Mr. Onur Ferhanoglu  
Mr. Erdem Erden  
Ms. Pelin Nayerden  
Mr. Burak Erarslan  
Mr. Kutal Gökçe

## ALUMNI

Dr. Arda Yalçinkaya  
Dr. Çağlar Ataman  
Mr. Hamdi Torun  
Mr. Olgaç Ergeneman  
Mr. Ata Akatay  
Mr. Murat Sayinta  
Mr. Serhan Işıkman  
Mr. Fatih Toy  
Ms. Aslıhan Arslan  
Mr. Gökhan Hatipoğlu  
Mr. Hüseyin Seren

## FULL LIST

<http://home.ku.edu.tr/~mems/members.htm>

Past and present OML members took the holiday period as an opportunity to get together for an end-of-the year gathering on Dec. 29th. An afternoon session with presentations by some of the past and present members of the OML ended with the traditional dinner & entertainment in Barınak restaurant.

15:00 - 15:25 Welcome & OML Update by Assoc. Prof. Hakan Ürey (Koç University)

15:25 - 15:50 "Ultra Wide-field On-Chip Cell Holography for Subcellular Imaging and Point-of-Care Diagnostics" by Serhan Isikman (PhD Student at UCLA)

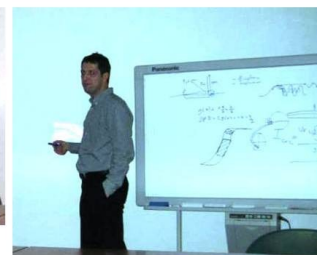
15:50 - 16:15 "3D Optical Imaging of Living Cells in Microgravity: Application to Study Dynamic Changes of the Cytoskeleton" by M. Fatih Toy (PhD Student at EPFL)

16:15 - 16:40 "Study of complex interfacial properties with nanoscale resolution optical microscopy" by A. Ata Akatay (PhD Student at EPFL)

16:40 - 17:05 "Diamond as a MEMS Material" by Dr. Caglar Ataman (Post-doctoral Researcher at EPFL)

17:05 - 17:30 "MEMS Inspired Biological creatures in OML and latest update on Thermal Imaging research" by Onur Ferhanoglu (PhD Student at Koç Univ.)

17:30 - 17:55 "Automatic Localization of Medical Devices in Magnetic Resonance Imaging Systems" by Assist. Prof. Arda D. Yalcinkaya (Boğaziçi Univ.)



Photos taken during OML Jam Session





## RECENT PUBLICATIONS

H. R. Seren, H. Ürey, "Optical Characterization of Micro and Nano Mechanical Systems in Two Dimensions," Sensors and Actuators A: Physical Volume 156, Issue 1, November 2009, Pages 217-221

M. F. Toy, O. Ferhanoglu, H. Torun, H. Ürey, "Uncooled Infrared Thermomechanical Detector Array: Design, Fabrication, and Testing," Sensors and Actuators A: Physical, Volume 156, Issue 1, November 2009, Pages 88-94

S. O. Isikman, H. Ürey, "Dynamic Modeling of magnetic film actuators," IEEE Transactions on Magnetics, Vol. 45, No: 7, pp. 2912-2919, 2009

C. Ataman, H. Ürey, "Compact Fourier Transform Spectrometers using FR4 Platform," Sensors and Actuators A: Physical, Volume 151, Issue 1, 8 April 2009, Pages 9-16

S. O. Isikman, R. B. Sprague, H. Ürey, "FR4 laser scanner with dynamic focus," Photonics Technology Letters," Vol. 21, p. 233-235, 2009

A. Ozturk, H. I. Ocakli, N. Ozber, H. Kavakli, H. Ürey, E. Alaca, "A magnetically actuated resonant mass sensor with integrated optical readout," Phot. Tech. Lett., Vol. 20, 1905-1907, 2008

## FULL LIST

<http://portal.ku.edu.tr/~hurey/publications.htm>

# OML DIRECTOR IN THE NEWS

Assoc. Prof. Hakan Ürey received BS'92 Middle East Technical University, Ankara, Turkey, MS and PhD (1997) Georgia Institute of Technology, Atlanta, USA. After PhD, he had 4.5 years of industrial experience working as a Principle Scientist at Microvision Inc. (USA). He has been one of the key contributors to the development of pico-projectors and wearable displays based on MEMS scanner technology. He joined Koc University in 2001 and currently an Associate Professor of Electrical Engineering. He has 22 US and European patents, 28 SCI journal papers, >100 conference papers with many invited talks, 8 edited books, 2 book chapters, and chaired several international conferences. He is the recipient of Siemens Excellence in Research Award (2006), Turkish Academy of Sciences Outstanding Young Research Award (2007), JCI Top Young Person Award in Science and Technology (2008), and TUBITAK Encouragement Award given to a few Scientists under the age of 40 every year (2009).

Dr. Ürey's research is focused on MEMS, micro-optics, sensors and actuators. His research group has many active and completed projects closely linked with the industry in USA, Europe, and Turkey. His group is one of the largest at KOC and has a very successful project completion track record. He participated in the following FP6 projects: 3DTV (NoE titled 3D Capture, Transmission, and Display), NEMO (NoE titled Network of Excellence in Micro Optics, WP leader on Optical MEMS), and MINOS (SSA titled Micro-Nano Sensors Europe). Currently he is a key contributor to two active FP7-STREP projects: MEMFIS – Ultrasmall MEMS FTIR Spectrometer (Sep 2008- Aug 2011), and HELIUM3 – High Efficiency Laser-Based Multi-User Multi-Modal 3D Display (Jan 2008-Dec 2010).



**Prof. Ürey received TUBITAK-Encouragement Award (2009) from the President of Turkey, Abdullah Gül, at a ceremony held on Dec. 25th, 2009.**



**Prof. Ürey explaining OML research to visitors**



# OML RESEARCH INTERESTS AND SPONSORS

MEMS/NEMS, micro-optics, photonic microsystems, 2D/3D displays , Biophotonic Microsystem Applications

- FP7-ICT STREP projects:  
HELIUM3D and MEMFIS
- Microvision Inc. (USA)
- Fraunhofer IPMS (DE)
- TÜBİTAK (TR) (2 projects)
- ASELSAN INC (TR)



**K**oç University's mission is to produce the most capable graduates by providing a world-class education, to advance the frontiers of knowledge and to contribute to the benefit of Turkey and humanity at large. Koç University's graduates will be leaders in their respective professions, critical thinkers, creative individuals and will be able to operate in any environment, adhere to the highest ethical standards, feel social responsibility and is committed to the values of democracy. **Koç University's research will contribute to advance universal knowledge and influence the intellectual, technological, economic and social developments in Turkey.**

KOÇ University is Vehbi Koc Foundation's non-profit research University established in 1993 in Istanbul-Turkey. KOÇ has 3,000 undergraduate and 400 graduate students in the masters and PhD programs. In spite of its short history, KOÇ established a strong research culture and became one of the top research Universities in Turkey in terms of scholarly articles and faculty awards. KOÇ has gained significant experience by participating in a number of EU funded projects since 2004 and has setup a project management office to help its academic staff in their efforts to successfully manage and complete their EU projects.

The sponsored programs (all research contracts and grants) at Koç University are administered by the Vice President of Research and Development's Office (VPRD Office).



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