

Prof. Dr. Hakan Ürey

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Professional Experience

Koç University, Istanbul, TURKEY

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| <i>Professor of Electrical Engineering</i> | 2010-present |
| <i>Associate Professor of Electrical Engineering</i> | 2007-2010 |
| <i>Assistant Professor of Electrical Engineering</i> | 2001-2007 |

RESEARCH

- Established the **Optical Microsystems Laboratory (OML)** <http://mems.ku.edu.tr> specialized in design, testing, and characterization of micro-optics and MEMS. Currently OML is one of the largest groups within the Engineering faculty. OML has more than 300m2 space including 3 separate rooms for special projects and a clean room for MEMS testing.
- Established a **Class 1000 Clean Room** for micro-optics and MEMS micro-fabrication (jointly with Prof. E. Alaca)
- Research Areas and Funding:
 Research and development projects focus on: MEMS scanners for display and imaging systems, MEMS Thermal Infrared Imaging Camera development, MEMS Spectrometers, Electrostatic and Electromagnetic actuators, Biological and chemical sensors, 3D and Augmented Reality displays.
- Research Sponsors: ERC-AdG (European Research Council) Advanced Grant (2014-2019), 3 ERC-Proof of Concept Grants, EC FP7 and FP6 Projects (partner and WP leader in 6 projects, since 2006), Microvision Inc.-USA (7 grants), ASELSAN A.S. (TR) (3 grants), Fraunhofer Institute-IPMS-Germany (1 grant), NSF (USA) (1 grant), TÜBİTAK (10 projects), OPET A.Ş. (TR) (2 grants), Fotoniks A.Ş. (TR) (1 grant).

TECHNOLOGY COMMERCIALIZATION

I founded 5 startups, which are spinoffs from my research lab at Koç University.

I was instrumental in technology development, patent licensing, and securing investment (totaling >\$25M) for the startups:

- 1. CY Vision (USA)**, The first company to demonstrate full-color computational holographic HMDs with real-time computation. Company has multiple contracts with automotive OEMs for commercializing the world's 1st 3D augmented reality head-up-display (AR-HUD).
- 2. Augmency (TR)**, developed novel augmented reality HMD hardware and software products for industry 4.0 applications. The company already has multiple commercial products in the market.

3. Quantag (TR), developed quantum dots (QDOT) as nanotags and optical sensors for in-line monitoring of liquids for security applications. The company has multiple commercial products in the market.

4. Tarabios (TR), developed lab-on-chip rapid diagnostics system using whole blood and micro-opto-mechanical sensing principles. The company has completed pre-clinical trials for a blood coagulation measurement instrument and planning to launch 1st biomedical product within 1-2 years.

5. STOPARKINSON (USA), developed a neural stimulator from the ear to relieve Parkinson symptoms. The device is currently in clinical trials in the US for FDA clearance.

TEACHING

- Undergraduate electrical engineering courses:
 - ELEC429: Introduction to Optics
 - ELEC491: Senior Design Project
- Graduate level courses
 - ELEC522: Introduction to MEMS (micro-electro-mechanical systems)
 - ELEC523: Optical Information Processing.

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| Cambridge University, UK , Cavendish Laboratory, <i>Visiting Professor</i> | 2013 |
| Boğaziçi University, TURKEY , Electrical Engineering, <i>Visiting Professor</i> | 2013 |
| Microvision Inc., Seattle, Washington, USA | |
| <i>Research Engineer; Sr. Research Engineer; Staff Engineer; Principal Engineer and Group Lead</i> | 1998-2002 |
| <i>Principal Consultant</i> | 2002-2014 |
| Georgia Institute of Technology, Atlanta, Georgia, USA | |
| <i>TUBITAK- NATO Science Program Graduate Student Fellow</i> | 1993-1994 |
| <i>Graduate Research Assistant, Center for Optical Science and Engineering</i> | 1995-1997 |
| Call / Recall Inc., San Diego, California, USA | |
| <i>Co-Op exchange student and Consultant</i> | 1996-1997 part time |
| Georgia Tech Research Institute, Atlanta, Georgia, USA | |
| <i>Graduate Research Asst, GTRI-Electro-Optics Laboratory (EOEML)</i> | 1996 |
| Bilkent University, Ankara, Turkey | |
| <i>Graduate Research and Teaching Assistant, Electrical and Electronics Engineering</i> | 1993 |

Education

Georgia Institute of Technology

School of Electrical and Computer Engineering, Atlanta, Georgia, USA 1993-1997

Ph.D. in Electrical Engineering 1997

Advisor: Dr. William T. Rhodes

Thesis Title: "Image Acquisition and Processing with AC-Coupled Cameras"

Graduate Cooperative Degree certificate (for industry work during PhD)

MS in Electrical Engineering 1996

1992-1993

Bilkent University

Electrical and Electronics Engineering Department, Ankara, Turkey

Graduate Course work in Optics, Communications, and Electronics

1988-1992

Middle East Technical University

Electrical Engineering Department, Ankara, Turkey

BS in Electrical Engineering

Academic Service:

- General Chair, IEEE Optical MEMS and Nanophotonics Conference, Istanbul, Turkey, Aug 2011.
- IEEE Optical MEMS and Nanophotonics Conference. TPC Member since 2006, Steering Committee Member since 2009;
- IEEE MEMS Conference, TPC Member, Cancun, Mexico (2011) and Paris, France (2012)
- IEEE Photonics Annual meeting, Local Chair, Antalya, Turkey, Oct 2009.
- Local Chair, International Conference on Opto-mechatronics (ISOT), Istanbul, Turkey, Sep. 2009
- Co-chair, NSF Workshop on Nanophotonics, Koc University, Istanbul, Turkey, 2006
- Organized Micro-Nano Systems Summer Workshop, Koc University, Istanbul, Turkey, 2005
- Chair (3 times) for SPIE Photonics Europe Conf. titled "MEMS, MOEMS, and Micromachining", in Strasbourg, France, in 2004, 2006, 2008
- Initiated and Chaired (4 times) the SPIE Photonics West Conf titled "MOEMS Display and Imaging Systems", in San Jose, California, 2003, 2004, 2005, and 2006

Awards and Achievements:

- Elginkan Foundation, Science Award, 2020
- Sedat Simavi Foundation, Science Award, 2019
- 1st Place Award, 2019 Koç Holding Companies, the Most Successful of the Year Award, Innovation Category, for Tarabios Point-of-Care Diagnostics Platform
- 1st Place Award, 2018 Koç Holding Companies, the Most Successful of the Year Award, Innovation Category, for Cyclops Head-Mounted Projection Display
- 1st Place Award, 2016 Koç Holding Companies, the Most Successful of the Year Award, Business Development Category, for Quantag Nanotagging System
- **ERC-AdG** European Research Council, Advanced Grant (2.5 Million€). Only recipient from Turkey.
- Science Academy of Turkey, Elected member, 2014
- Koç University, Outstanding Faculty Award, 2013
- **TÜBİTAK-Encouragement** Award from the Scientific and Technical Research Council of Turkey (2009).
- **TÜBA-GEBİP** Distinguished Young Scientist Award from Turkish Academy of Sciences (2007)

- Special award from Microvision Inc. for Outstanding contributions to “*Advancement of Scanner Technologies.*” (2008)
- Werner Von Siemens Faculty Excellence Award for outstanding research performance at Koç University (2006)
- IEEE Senior Member (Dec 2009)
- Ten Outstanding Young Person (TOYP) Award in *Science and Technology* category, Junior Chamber International (JCI) Turkey (2008).
- New Focus Student Award, Optical Society of America Annual Meeting (1995)
- Co-operative program certificate, Georgia Institute of Technology, Atlanta, USA (1997)
- Among the 3 recipients of TUBITAK-NATO Science Program Graduate Fellowship (1992)
- Recipient of Haci Omer SABANCI Foundation scholarship for 4 years (1988-1992)

Publications

Citations: <http://scholar.google.com/citations?user=4z4L9HMMAAAJ>

| Source - Google Scholar (GS) | Total | Citations | H-Index |
|------------------------------|-------|-----------|---------|
| All Publications | >250 | 6600 | 41 |

Edited Books:

1. *MOEMS Display and Imaging Systems*, Hakan Urey, Editor, Proceedings of SPIE, Pages: 360, Volume: 4985, SPIE Press, Bellingham (2003)
2. *MOEMS Display and Imaging Systems II*, Hakan Urey and David Dickensheets, Editors, Proceedings of SPIE, Volume: 5348, SPIE Press, Bellingham (2004)
3. *MEMS, MOEMS, and Micromachining*, Hakan Urey and Ayman El-Fatraty, Editors, Proceedings of SPIE, Volume: 5455, SPIE Press, Bellingham (2004)
4. *MOEMS Display and Imaging Systems III*, Hakan Urey and David Dickensheets, Editors, Proceedings of SPIE, Volume: 5721, SPIE Press, Bellingham (2005)
5. *MOEMS Display and Imaging Systems IV*, Hakan Urey, David Dickensheets, Bishnu Gogoi, Editors, Proceedings of SPIE, Volume: 6114, SPIE Press, Bellingham (2006)
6. *MEMS, MOEMS, and Micromachining II*, Hakan Urey and Ayman El-Fatraty, Editors, Proceedings of SPIE, Volume: 6186, SPIE Press, Bellingham (2006)
7. *MEMS, MOEMS, and Micromachining III*, Hakan Urey, Editor, Proceedings of SPIE, Volume: 6993, SPIE Press, Bellingham (2008)

Book Chapters:

1. **Hakan Urey**, *Retinal Scanning Displays*, in Encyclopedia of Optical Engineering, R. Driggers, Editor, Marcel-Dekker, 2003
2. **Hakan Urey** and David Dickensheets, *Display and Imaging Systems*, Ch. 8 in MOEMS and Applications, E. Motamedi, Editor, SPIE Press, Bellingham, 2004
3. **Hakan Urey**, Sid Madhavan, Margaret Brown, Chapter: 10.2.4 “*MEMS Displays*,” Handbook of Visual Display Technology, 2011.
4. Jannick P. Rolland, Kevin P. Thompson, **Hakan Urey**, and Mason Thomas, Chapter: 10.4.1 “*See-Through Head Worn Display (HWD) Architectures*,” Handbook of Visual Display Technology, 2011.

Issued US Patents (Total 43 as of May 2021)

<https://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&u=%2Fnethtml%2FPTO%2Fsearch-adv.htm&r=0&f=S&l=50&d=PTXT&RS=IN%2Furey&Refine=Refine+Search&Query=IN%2Furey+and+IN%2Fhakan>

Foreign Patents (some belong to same patent family, list not complete):

| List | Foreign Patents |
|------|-----------------------------------|
| 1 | CA2913211A1 |
| 2 | CN105324150B |
| 3 | CN105492957B |
| 4 | EP1,677,086 (B1) |
| 5 | EP1336127 (B1) |
| 6 | EP2912453B1 |
| 7 | EP2916906B1 |
| 8 | EP3014334B1 |
| 9 | EP3044577B1 |
| 10 | EP3426335B1 |
| 11 | JP2019508214A |
| 12 | JP4515029 (B2) |
| 13 | JP5864040B2 |
| 14 | JP6190056B2 |
| 15 | JP6286781B2 |
| 16 | JP6330046B2 |
| 17 | JP6653754B2 |
| 18 | PCT/TR2016/050064 |
| 19 | RU2650042C2 |
| 20 | RU2700013C1 |

<https://worldwide.espacenet.com/patent/search/family/056027137/publication/EP3384671A1?q=ia%20all%20%22urey%22%20AND%20ia%20all%20%22hakan%22>

International Journal Papers:

1. Kharratian, S., Urey, H. & Onbaşlı, M.C. Broadband Enhancement of Faraday Effect Using Magnetoplasmonic Metasurfaces. *Plasmonics* **16**, 521–531 (2021). <https://doi.org/10.1007/s11468-020-01304-6>
2. Cem, A., Hedili, M.K., Ulusoy, E. *et al.* Foveated near-eye display using computational holography. *Sci Rep* **10**, 14905 (2020). <https://doi.org/10.1038/s41598-020-71986-9>
3. B. Soner, E. Ulusoy, A. M. Tekalp and H. Urey, "Realizing a Low-Power Head-Mounted Phase-Only Holographic Display by Light-Weight Compression," in *IEEE Transactions on Image Processing*, vol. 29, pp. 4505-4515, 2020, <https://doi.org/10.1109/TIP.2020.2972112> .
4. Cakmak, Y. O., Ozsoy, B., Ertan, S., Cakmak, O. O., Kiziltan, G., Yapici-Eser, H., Ozyaprak, E., Olcer, S., Urey, H., & Gursoy-Ozdemir, Y. (2020). Intrinsic Auricular Muscle Zone Stimulation Improves Walking Parameters of Parkinson's Patients Faster Than Levodopa in the Motion Capture Analysis: A Pilot Study. *Frontiers in neurology*, *11*, 546123. <https://doi.org/10.3389/fneur.2020.546123>
5. Kharratian, S., Urey, H., Onbaşlı, M. C., Advanced Materials and Device Architectures for Magneto-optical Spatial Light Modulators. *Adv. Optical Mater.* 2020, 8, 1901381. <https://doi.org/10.1002/adom.201901381>
6. Aygun, U., Urey, H. & Yalcin Ozkumur, A. Label-free detection of nanoparticles using depth scanning correlation interferometric microscopy. *Sci Rep* **9**, 9012 (2019). <https://doi.org/10.1038/s41598-019-45439-x>
7. Seyedmahdi Kazempourradi, Yusuf S. Yaras, Erdem Ulusoy, Hakan Urey, "Micro-mirror-array based off-axis flat lens for near-eye displays," Vol. 27, No. 11 | 27 May 2019 | Optics Express 15172, <https://doi.org/10.1364/OE.27.015172>
8. Uğur Yekta Başak, Seyedmahdi Kazempourradi, Cemalettin Yilmaz, Erdem Ulusoy, Hakan Urey, [Dual focal plane augmented reality interactive display with gaze-tracker](#), *OSA Continuum* 2 (5), 1734-1745, 2019
9. MK Hedili, B Soner, E Ulusoy, H Urey [Light-efficient augmented reality display with steerable eyebox](#), *Optics express* 27 (9), 12572-12581, 2019
10. S Kazempourradi, E Ulusoy, H Urey, [Full-color computational holographic near-eye display](#), *Journal of Information Display* 20 (2), 45-59, 2019
11. Kharratian, S., Urey, H. & Onbaşlı, M.C. RGB Magnetophotonic Crystals for High-contrast Magneto-optical Spatial Light Modulators. *Sci Rep* **9**, 644 (2019). <https://doi.org/10.1038/s41598-018-37317-9>
12. R. Khayatzaadeh, F.Civitci, O. Ferhanoglu, H. Urey " Scanning fiber microdisplay: design, implementation, and comparison to MEMS mirror-based scanning displays" *Optics Express*, February 2018, Vol. 26, Issue 5, pp. 5576-5590 (2018) <https://doi.org/10.1364/OE.26.005576>

13. S.Soomro, H. Urey “Integrated 3D display and imaging using dual purpose passive screen and head-mounted projectors and camera” *Optics Express*, Jan 2018, Vol 26, pp 1161-1173, <https://doi.org/10.1364/OE.26.001161>
14. Y.S. Yaras, H. Urey, A.B. Gunduz, G. Saglam, S. Olcer, F. Civitci, İ. Baris, G. Yaralioglu, “Coagulation Measurement from whole blood Using Vibrating optical Fiber in a Disposable Cartridge.” *Journal of Biomedical Optics*, November 2017. [10.1117/1.JBO.22.11.117001](https://doi.org/10.1117/1.JBO.22.11.117001)
15. [Ugur Aygun](#), [Oguzhan Avci](#), [Elif Seymour](#), [Hakan Urey](#), [M. Selim Ünlü](#), [Ayca Yalcin Ozkumur](#) “Label-Free and High-Throughput Detection of Biomolecular Interactions Using a Flatbed Scanner Biosensor” *ACS Sens.*, 2017, 2 (10), pp 1424–1429, October 2017, DOI: 10.1021/acssensors.7b00263
16. S.R. Soomro, H.Urey “ Light-efficient augmented reality 3D display using highly transparent retro-reflective screen” *ASO Publishing*, Vol.56, Issue 22, pp 6108-6113, August 2017, <http://www.opticsinfobase.org/ao/upcomingissue.cfm>
17. Cakmak YO, Apaydin H, Kiziltan G, Gündüz A, Ozsoy B, Olcer S, Urey H, Cakmak OO, Ozdemir YG, and Ertan S, “Rapid Alleviation of Parkinson’s Disease Symptoms via Electrostimulation of Intrinsic Auricular Muscle Zones”, *Frontiers in Human Neuroscience*, Vol.11, pp338, August 2017
18. S.R. Soomro, E. Ulusoy, H. Urey, ” Decoupling of Real and Digital Content in Projection based Augmented Reality Systems using Time Multiplexed Image Capture,” *Journal of Imaging Science and Technology*, Volume 61, Number 1, January 2017, pp. 10406-1-10406-6(6)
19. S.R. Soomro, H. Urey, “Design, Fabrication and Characterization of Transparent Retro-reflective Screen,” *Optics Express*, Vol.24, Issue 21, pp 24232-24241, Oct.2016
20. U. Adiyen, F. Civitci, G. Yaralioglu, H. Urey, “A Prism-Based Non-Linear Optical Readout Method for MEMS Cantilever Arrays,” *Sensors and Actuators A: Physical* 250, 219-228, 2016
21. Aref Mostafazadeh, G. Yaralioglu, H. Urey, “Optical fiber array based simultaneous parallel monitoring of resonant cantilever sensors in liquid,” *Sensors and Actuators*, Volume 242, Pages 132–139, May 2016,
22. D. Mengu, E. Ulusoy, H. Urey, " Non-iterative phase hologram computation for low speckle holographic image projection," *Optics Express*, 24(5), 4462-4476 (2016)
23. S. Z. Lulec, U. Adiyen, G. Yaralioglu, Y. Leblebici, H. Urey, “MEMS Cantilever Sensor Array Oscillators: Theory And Experiments,” *Sensors and Actuators A: Physical*, Vol. 237, pp. 147-154, Jan. 2016
24. U. Adiyen, F. Civitci, O. Ferhanoglu, H. Torun, H. Urey, “A Prism-Based Optical Readout Method for MEMS Bimaterial Infrared Sensors”, *IEEE Photonics Technology Letters*, vol. 28, no. 17, pp. 1866-1869, Sept.1, 2016.
25. K. Aksit, D. Kade, O. Ozcan, H. Urey, “Head-mounted mixed reality projection display for games production and entertainment,” *Personal and Ubiquitous Computing*, Vol. 19, Issue 3, pp. 509-521, May 2015.
26. O. Cakmak, E. Ermek, N. Kilinc, G.G. Yaralioglu, H Urey, “Precision density and viscosity measurement using two cantilevers with different widths,” *Sensors and Actuators: A Physical*, Vol. 232, pp. 141-147, August 2015.
27. U. Adiyen, F. Civitci, O. Ferhanoglu, H. Torun, H. Urey, “A 35 μm pitch IR Thermo-Mechanical MEMS Sensor with AC-coupled Optical Readout,” *Journal Selected Topics in Quantum Electronics*, *IEEE Journal of* 21, no.4, 1-6, 2015.
28. O. Cakmak, G.Yaralioglu, N. Kilinc, H. Kavakli, E. Ermek, S. Bulut, “A Cartridge Based Sensor Array Platform for Multiple Coagulation Measurements from Plasma,” *Lab on Chip*, Vol. 15(1), pp. 113-120, 2015.
29. K. Aksit, A. H. G. Niaki, E. Ulusoy, H. Urey, “Super Stereoscapy Technique for Comfortable and Realistic 3D Displays,” *Optics Letters*, Vol. 39 (24), pp. 6903-6906, 2014.
30. N.P. Ayerden, U. Aygun, S.T.S. Holmstrom, S. Olcer, B. Can, J.-L. Stehle, and H. Urey, “High-speed broadband FTIR system using MEMS,” *Applied Optics*, Vol. 53 (31), pp. 7267-7272, 2014.
31. N. Kilinc, O. Cakmak, A. Kosemen, E. Ermek, S. Ozturk, Y. Yerli, Z. Z. Ozturk, H. Urey, “Fabrication of 1D ZnO nanostructures on MEMS cantilever for VOC sensor application,” *Sensors and Actuators B: Chemical*, Vol. 202, pp. 357-364, 2014.
32. S. Holmstrom, U. Baran, H. Urey, “MEMS Laser Scanners: A Review,” *J. Microelectromech. Syst.*, vol. 23, pp. 259-275, 2014.
33. R. B. Erarslan, U. Adiyen, S. Z. Lulec, S. Olcer, Y. Temiz, Y. Leblebici, H. Torun, H. Urey, “Design and characterization of micromachined sensor array integrated with CMOS based optical readout,” *Sensors and Actuators A: Physical*, Vol. 215, pp. 44-50, 2014.
34. O. Eldes, K. Aksit, H. Urey, “Multi-view autostereoscopic projection display using rotatory screen,” *Optics Express*, Vol. 21, Iss. 23, pp. 29043-29054, 2013.
35. M. K. Hedili, M. Freeman, H. Urey, “Transmission characteristics of a bidirectional transparent screen based on reflective microlenses,” *Opt. Express*, Vol. 21, Iss. 21, pp. 24636–24646, 2013.
36. O. Cakmak, C. Elbuken, E. Ermek, A. Mostafazadeh, I. Baris, B. E. Alaca, I. H. Kavakli, H. Urey, “Microcantilever Based Disposable Viscosity Sensor for Serum and Blood Plasma Measurements,” *Methods*, Vol. 63, Iss. 3, pp. 225-232, 2013

37. E. Uzunlar, B. Beykal, K. Ehrlich, D. Sanli, A. Jonáš, H. Urey, B. E Alaca, A. Kiraz, C. Erkey, "Frequency Response of Microcantilevers Immersed in Gaseous, Liquid, and Supercritical Carbon Dioxide," *J Supercritical Fluids* 81, 254-264, 2013 <http://dx.doi.org/10.1016/j.supflu.2013.06.013> (2013)
38. K. Akşit, H. Baghsiahi, P. Surman, S. Ölçer, E. Willman, D. R. Selviah, S. Day, and H. Urey, "Dynamic exit pupil trackers for autostereoscopic displays," *Opt. Express* 21, 14331-14341 (2013)
39. M. K. Hedili, M. O. Freeman, and H. Urey, "Microlens array-based high-gain screen design for direct projection head-up displays," *Applied Optics* Vol. 52, Iss. 6, pp. 1351-1357, 2013.
40. U. Baran, D. Brown, S. Holmstrom, D. Balma, W. O. Davis, P. Muralt, and H. Urey, "Resonant PZT MEMS Scanner for High-Resolution Displays," *IEEE J. Microelectromechanical Systems.*, Vol. 21 (6), p. 1303-1310, 2012.
41. U. Baran, W. O. Davis, S. Holmstrom, D. Brown, J. Sharma, S.K Gokce, and H. Urey, "Linear Stiffness Rotary MEMS Stage," *IEEE J. Microelectromechanical Systems*, vol. 21, pp. 514–516, 2012.
42. H. R. Seren, S. Holmstrom, P. Ayerden, J. Sharma, and H. Urey, "Lamellar-Grating-Based MEMS Fourier Transform Spectrometer," *IEEE J. Microelectromechanical Systems*, vol. 21, pp. 331–339, 2012.
43. K. Aksit, O. Eldes, S. Viswanathen, M. Freeman, H. Urey, "Portable 3D laser projector using mixed polarization technique," *Journal of Displays*, vol. 8 (10), pp. 582-589, 2012
44. O. Ferhanoglu and H. Urey, "Sensitivity enhancement of grating interferometer based two-dimensional sensor arrays using two-wavelength readout," *Applied Optics*, Vol. 50, Issue 19, pp. 3289-3295, 2011.
45. E. Timurdogan, B. E. Alaca, I. H. Kavakli, H. Urey, "MEMS biosensor for detection of Hepatitis A and C viruses in serum," *Biosensors and Bioelectronics*, Volume 28, Issue 1, pp. 189-194, 2011.
46. O. Ferhanoglu, M. F. Toy, and H. Urey, "Fourier optics analysis of grating sensors with tilt errors," *Optics Letters*, Vol. 36, Issue 12, pp. 2254-2256, 2011.
47. (Invited paper) H. Urey, K. V. Chellephan, E. Erden, and P. Surman, "State of the Art in Stereoscopic and Autostereoscopic Displays," *Proc. IEEE*, 99 (4), 540-555, 2011.
48. S. K. Gokce, S. Holmstrom, C. Hibert, S. Olcer, D. Bowman and H. Urey, "Two-Dimensional MEMS Stage Integrated with Microlens Arrays for Laser Beam Steering," *J. Microelectromechanicalsystems*, Vol. 20, , pp. 15-17, 2011.
49. E. Timurdogan, N. Ozber, S. Nargul, S. Yavuz, M. S. Kilic, I. H. Kavakli, H. Urey, and B. E. Alaca, "Detection of human K-opioid antibody using microresonators with integrated optical readout," *Biosensors and Bioelectronics*, Vol. 26, pp. 195-201, 2010.
50. A. Arslan, D. Brown, W. Davis, S. Holmstrom, S. K. Gokce, H. Urey, "Comb-Actuated Resonant Torsional Microscanner with Mechanical Amplification," *IEEE J. Microelectromechanical Systems*, Vol. 19, No. 4, pp. 936-943, 2010.
51. (Invited paper) K. V. Chellephan, E. Erden, and H. Urey, "Laser-based displays: a review," *Applied Optics* Vol. 49 (Feature issue on Lasers: The first fifty years), Issue 25, pp. F79-F98, 2010.
52. G. Hatipoglu, H. Urey, "FR4 based electromagnetic energy harvester for wireless sensor nodes," *Smart Materials and Structures*, Vol. 19, 015022 (11 pages), 2010.
53. O. Ferhanoglu, H. Seren, S. Lüttjohann, H. Urey, "Lamellar grating optimization for Fourier transform spectrometers," *Optics Express*, Vol. 17, pp. 21289-21301, 2009.
54. S. K. Gokce, S. Holmstrom, C. Hibert, C. Ataman, A. Arslan, H. R. Seren, H. Urey, "MEMS Stage Integrated with Microlens Arrays for High-Resolution Beam Steering," *Procedia Chemistry*, Volume 1, Issue 1, Pages 1319-1322, 2009 (also published as Proceedings of the Eurosensors XXIII conference).
55. G. Hatipoglu, H. Urey, "FR4-based electromagnetic energy harvester for wireless tyre sensor nodes," *Procedia Chemistry*, Volume 1, Issue 1, Pages 1211-1214, 2009 (also published as Proceedings of the Eurosensors XXIII conference).
56. C. Ataman, H. R. Seren, H. Schenk, H. Urey, "Dynamic Characterization of MEMS Scanners," *Sensors & Transducers Journal*, Vol. 108, Issue 9, pp. 31-39 (2009)
57. S. O. Isikman, S. Varghese, F. Abdullah, R. Augustine, R. B. Sprague, V. Andron, and H. Urey, "Advanced imaging with dynamic focus and extended depth using integrated FR4 platform," *Optics Express*, Vol. 17, Issue 19, pp. 17179–17189 (2009)
58. H. R. Seren, H. Urey, "Optical Characterization of Micro and Nano Mechanical Systems in Two Dimensions," *Sensors and Actuators: A. Physical*, Vol. 156, p. 217-221, doi:10.1016/j.sna.2009.02.014 2009.
59. M. F. Toy, O. Ferhanoglu, H. Torun, H. Urey, "Uncooled Infrared Thermomechanical Detector Array: Design, Fabrication, and Testing," *Sensors and Actuators: A. Physical*, Vol. 156, p. 88-94, doi:10.1016/j.sna.2009.02.010 2009
60. C. Ataman, H. Urey, "Compact Fourier Transform Spectrometers using FR4 Platform," *Sensors and Actuators: A. Physical*, Vol. 151, pp. 9-16, 2009 (doi:10.1016/j.sna.2008.12.022, 2009
61. S. O. Isikman, H. Urey, "Dynamic modeling of magnetic film actuators," *IEEE Transactions on Magnetics*, Vol. 45, No: 7, pp. 2912-2919, 2009.

62. S. O. Isikman, R. B. Sprague, H. Urey, "FR4 laser scanner with dynamic focus," IEEE Photonics Technology Letters, Vol. 21, p. 233-235, 2009
63. A. Ozturk, H. I. Ocakli, N. Ozber, H. Kavakli, H. Urey, E. Alaca, "A magnetically actuated resonant mass sensor with integrated optical readout," IEEE Photonics Technology Letters, Vol. 20, No. 23, p. 1905-1907, 2008
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