

**Şenol Mutlu, Ph.D.**  
Professor  
Boğaziçi University, EE Dept.,  
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### **PERSONAL INFORMATION**

Nationality: Turkish  
Year of Birth: 1977  
Marital Status: Married, with one child

### **EDUCATION**

**Doctor of Philosophy (Ph.D.)**, Electrical Engineering, Sep. 2000-Jan. 2005  
University of Michigan, Ann Arbor, MI. Major in Circuits and Microsystems. Minor in Solid State.  
Advisors: Carlos H. Mastrangelo and Yogesh B. Gianchandani.

Ph.D. Thesis: *Microfluidic Biochemical Analysis System With Electro-Osmotic Pump and Thermally Responsive Polymer Valve.*

**Master of Science (M.S.)**, Electrical Engineering: Circuits and Microsystems, 2000-2002  
University of Michigan, Ann Arbor, MI

**Bachelor of Science (B.S.)**, Electrical Engineering (Computers), 1996-2000  
University of Southern California (USC), Los Angeles, CA. **Overall GPA** 3.93/4.00

**High School Education**, İstanbul Atatürk Fen Lisesi, İstanbul, Türkiye, 1992-1995

### **WORK EXPERIENCE**

- **Full Time Professor**, Jul. 2017-Now, Boğaziçi University, Department of Electrical and Electronics Engineering, İstanbul, TURKEY.
- **Associate Professor**, Feb. 2013-Jul. 2017, Boğaziçi University, Department of Electrical and Electronics Engineering, İstanbul, TURKEY.
- **Assistant Professor**, Sep. 2005-Feb. 2013, Boğaziçi University, Department of Electrical and Electronics Engineering, İstanbul, TURKEY.
- **Post-doctoral Research Fellow**, Jan. 2005 – June 2005, University of Michigan, Ann Arbor, *Michigan Nanofabrication Facility*, Electrical Engineering and Computer Science Department.  
Advisor: Khalil Najafi.
- **Research Assistant**, Sept 2000 – Jan. 2005: University of Michigan, Ann Arbor, *Engineering Research Center for Wireless Integrated MicroSystems (ERC WIMS)*, Electrical Engineering and Computer Science Department.

Project title: “*Large-Scale Integration of Solid-State Microfluidic Valves with No Moving Parts*”  
Sponsored by DARPA Bioflips program.

### **FOUNDED and DIRECTED LABORATORIES**

- Founder and Director of **Bogazici University Micro Electro Mechanical Systems (BUMEMS) Laboratory**, Sep 2005-Now, Boğaziçi University, Department of Electrical and Electronics Engineering, İstanbul, TURKEY.

The aim of this laboratory is to do research on Micro ElectroMechanical Systems (MEMS), circuits, MEMS-circuit integration and polymer microfabrication including organic / polymer electronics and microfluidics. The initial focus is mainly on polymer microfabrication and their applications to MEMS, integrated polymer microsystems and electronic circuitry since it involves relatively cheaper and easier fabrication methods and equipment. The efforts to build the BUMEMS laboratory at the Department of Electrical and Electronics Engineering started on September 2005. The laboratory is under constant development. In-house polymer MEMS fabrication capabilities are developed, which lead to the fabrication of polymer electronics, polymer light emitting diodes, microfluidic devices and various integrated polymer micro systems. Novel devices have been shown by integrating organic electronics to MEMS and microfluidics.

### **CONFERENCES ORGANIZED**

- Technical Program Co-Chair, The fourth conference on Ph.D. Research in Microelectronics and Electronics (PRIME) 2008, Istanbul, Turkey, 22-25 June 2008.

### **ADMINISTRATIVE and ACADEMIC SERVICES**

- Member of the Advisory Board of Technology and Innovation Grant Programs Directorate (TEYDEB) of The Scientific and Technological Research Council of Turkey (TUBITAK), Electrical-Electronic Technologies Group (ELOTEG), 2015 - 2016.
- Member of the Advisory Board of The Scientific and Technological Research Council of Turkey (TUBITAK), Electrical-Electronics and Information Research Group (EEEAG), 2012 - 2014.
- Member of the Advisory Board of the Bogazici University Advanced Technologies Research and Development Center, 2008 - Now.
- Advisor, Senior Design Projects Class, Department of Electrical and Electronics Engineering, Fall 2007-Now.
- Panelist for TUBITAK 1001 and Kariyer Project Panels, **EEEAG** Spring 2006, Summer 2007, Fall 2007, Summer 2007, Fall 2008, Spring 2009, Fall 2010, Fall 2011 **TBAG** Spring 2007, Summer 2007, Summer 2008, Fall 2009, **MAG** Fall 2012.
- Periodic Evaluator for TUBITAK 1001 and Kariyer Projects
- Panelist and Periodic Evaluator for TUBITAK TEYDEB Projects

### **TEACHING EXPERIENCE**

- **Instructor**, EE 535: Introduction to Micro Electro Mechanical Systems, Boğaziçi University, İstanbul, Turkey, Fall 2005 – Now.
- **Instructor**, EE 307: Semiconductor Physics and Devices, Sabancı University, EE Department, İstanbul, Turkey, Fall 2015.
- **Instructor**, EE 540: Advanced Digital Systems, Boğaziçi University, İstanbul, Turkey, Spring 2006, Spring 2007, Spring 2008.
- **Instructor**, EE 443: Microprocessors, Boğaziçi University, İstanbul, Turkey, Fall 2008 – Now.
- **Instructor**, EE 201: Electrical Circuits I, Boğaziçi University, İstanbul, Turkey, Spring 2012.
- **Instructor**, EE 240: Digital Systems, Boğaziçi University, İstanbul, Turkey, Spring 2007-Now.

- **Teaching Assistant**, EECS 515: Integrated Microsystems, University of Michigan, Ann Arbor, MI, Fall 2004.
- **Teaching Assistant**, EECS 514: Advanced Micro Electro Mechanical Systems (MEMS) devices and technologies, University of Michigan, Ann Arbor, MI, Winter 2004.
- **Teaching Assistant**, EECS 498/598: Micromanufacturing Processes, University of Michigan, Ann Arbor, MI, Winter 2004.

## **PROJECTS**

- **Realization of Wireless and Batteryless System with Sensor by Developing Triboelectric Energy Harvesters with Nano Surfaces and Matched RF Integrated Circuits**
  - Project Sponsor: TÜBİTAK 1003 (2016-2019)
  - Project Team: Şenol Mutlu
  - Responsibility: Principal Investigator
  - Project Code: 215E288
  - Budget: ~\$500000
- **Realization of Electronic Circuits with Microfluidics and Its Sensors Applications**
  - Project Sponsor: TÜBİTAK 1001 (2015-2018)
  - Project Team: Şenol Mutlu
  - Responsibility: Principal Investigator
  - Project Code: 114R080
  - Budget: ~\$300000
- **Organic Electronics Integrated with Micro and Nano Fluidic Channels**
  - Project Sponsor: TÜBİTAK 1001 (2010-2013)
  - Project Team: Şenol Mutlu, Amitav Sanyal
  - Responsibility: Principal Investigator
  - Project Code: 110E063
  - Budget: ~\$300000
- **Integrated Polymer Micro Systems (INPOMIS)**
  - Project Sponsor: TÜBİTAK 1001 (2006-2009)
  - Project Team: Şenol Mutlu, Günhan Dündar
  - Responsibility: Principal Investigator
  - Project Code: 106E013
  - Budget: ~\$300000
- **Novel Biopsy Needle and Assisted Robotic System Design for Prostate Biopsy Procedure under MRI**
  - Project Sponsor: TÜBİTAK 1001 (2015-2018)
  - Project Team: Özgür Kocatürk, Şenol Mutlu
  - Responsibility: Researcher
  - Project Code: 115E271
  - Budget: ~\$150000
- **A 5 Fr “Active” Guiding Catheter Design for Percutaneous Congenital Heart Diseases Treatment in Pediatric Patients under MRI**
  - Project Sponsor: TÜBİTAK 1001 (2013-2015)
  - Project Team: Özgür Kocatürk, Şenol Mutlu
  - Responsibility: Researcher
  - Project Code: 112R024
  - Budget: ~\$150000

- **A Novel Integrated Optoelectronic System For Automatic Catheter Localization in Interventional MRI**

Project Sponsor: TÜBİTAK 1001 (2008-2011)  
Project Team: Arda Deniz Yalçinkaya, Cengizhan Öztürk, Şenol Mutlu  
Responsibility: Researcher  
Project Code: 108E119  
Budget: ~\$350000

- **Polymer MEMS and Polymer Light Source Based Monolithic Integrated Displays**

Project Sponsor: TÜBİTAK 1001 (2007-2010)  
Project Team: Arda Deniz Yalçinkaya, Şenol Mutlu  
Responsibility: Researcher  
Project Code: 107E053  
Budget: ~\$250000

- **Center for the Development of Microsystem Based Medical Devices (Mikrosistem Bazlı Tıbbi Cihaz Geliştirme Merkezi)**

Project Sponsor: Turkish Republic State Planning Organization Devlet Planlama Teşkilatı (2008-2011)  
Project Team: Cengizhan Öztürk, Şenol Mutlu, Arda Deniz Yalçinkaya, Günhan DüNDAR, Kıvanç Mihçak, Burak Acar, Amitav Sanyal, Rana Sanyal, Ata Akın, Murat Gülsoy  
Responsibility: Co-Principal Investigator  
Budget: ~\$ 3 million

The purpose of this project is to found a center laboratory for the development of high-tech medical devices with smart integrated microsystems that can be inserted or implanted to human body.

- **Realization of Wireless and Batteryless Operating and Communicating Sensors**

Project Sponsor: European Cooperation in Science and Technology: COST-Bogazici University Research Fund (2013-2016)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Project Code: 7640  
Budget: ~\$45000

- **Implementation of Optically Powered and Optically Communicating Wireless and Batteryless Microsystem**

Project Sponsor: Bogazici University Research Fund (2012-2013)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Project Code: 6520  
Budget: ~\$15000

- **LED Based Wireless Microsystem Design and Fabrication**

Project Sponsor: Bogazici University Research Fund (2011-2012)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Project Code: 6037  
Budget: ~\$15000

- **Development of Water Gated Transistors Using Ultra Thin Single Crystalline Silicon Films**

Project Sponsor: Bogazici University Research Fund (2011-2012)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Project Code: 6987

Budget: ~\$15000

- **Self-Terminating Electrochemical Etching of Stainless Steel for the Fabrication of Micro-Mirrors**

Project Sponsor: Bogazici University Research Fund (2010-2011)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Project Code: 5021  
Budget: ~\$15000

- **Realization of MicroHeater Array for Thermal Patterning**

Project Sponsor: Bogazici University Research Fund (2009-2010)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Project Code: 09A201P  
Budget: ~\$15000

- **Performance Enhancement of Polymer Photovoltaic Cells Using Post Fabrication Thermal and Electric Field Treatment under Vacuum**

Project Sponsor: Bogazici University Research Fund (2008-2009)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Project Code: 08A201  
Budget: ~\$15000

- **Fabrication and performance evaluation of flexible photocells and light emitting diodes for lighting purposes using semiconducting polymers**

Project Sponsor: Istanbul Metropolitan Municipality (2007-2008)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Budget: ~\$9000

- **Tactile Sensors and Imagers Capable of Reading Fingerprints Using Polymer Microfabrication**

Project Sponsor: Bogazici University Research Fund (2006-2008)  
Project Team: Şenol Mutlu  
Responsibility: Principal Investigator  
Project Code: 06A201  
Budget: ~\$15000

## **PUBLICATIONS**

**Total Citation: 701 H-Index: 13 (Based on Google Scholar, November 2017)**

**Total Citation: 438 H-Index: 10 (Based on ISI Web of Science, November 2017)**

### **Journal Papers:**

1. B.G. Sonmez, O. Ertop, Senol Mutlu, "Modelling and Realization of a Water-Gated Field Effect Transistor (WG-FET) Using 16-nm-Thick Mono-Si Film", *Scientific Reports*, vol. 7, Issue 1, pages 12190, 2017.
2. Iskender Haydaroglu, M. Ozgun, Senol Mutlu, "Optically Powered Optical Wireless Transmitter Using a Single Light Emitting Diode", *IEEE Transactions on Circuits and Systems I*, vol. 64, Issue 8, pages 2003-2012, 2017.

3. Sevde Puza, Elif Gencturk, Irem Ezgi Odabasi, Emre Iseri, Senol Mutlu, Kutlu Ulgen, "Fabrication of cyclo olefin polymer microfluidic devices for trapping and culturing of yeast cells," *Biomedical Microdevices*, Vol. 19, Issue 2, 40, 12 pages, 2017.
4. Nuno Carvalho, et al., Senol Mutlu, et al., "Europe and the Future for WPT : European Contributions to Wireless Power Transfer Technology," *IEEE Microwave Magazine*, Vol. 18, Issue 4, pp. 56-87, 2017.
5. E. Gencturk, Senol Mutlu, K.O. Ulgen, "Advances in microfluidic devices made from thermoplastics used in cell biology and analyses", *Biomicrofluidics*, vol. 11, Issue 5, 051502, 2017.
6. Mohammad Beygi, Senol Mutlu, Burak Guclu "Microfabricated strain gauge array on polymer substrate for tactile neuroprostheses in rats," *Journal of Micromechanics and Microengineering*, v. 26, Issue 8, 084006, 2016.
7. Engin Baysoy, Dursun Korel Yildirim, Cagla Ozsoy, Senol Mutlu, Ozgur Kocaturk, "Thin Film Based Active Resonant Marker Design for Low Profile Interventional Cardiovascular MRI Devices", *Magnetic Resonance Materials in Physics, Biology and Medicine (MAGMA)*, 2016, doi:10.1007/s10334-016-0586-8
8. I. Haydaroglu, Senol Mutlu, "Optical Power Delivery and Data Transmission in a Wireless and Batteryless Microsystem Using a Single Light Emitting Diode", *IEEE/ASME Journal of Microelectromechanical Systems*, Vol. 24, Issue 1, pp. 155-165, 2015.
9. Berkan Yaman, Ismail Terkesli, K.M. Turksoy, A. Sanyal, Senol Mutlu, "Fabrication of a Planar Water Gated Organic Field Effect Transistor Using Hydrophilic Polythiophene for Improved Digital Inverter Performance", *Organic Electronics*, Volume 15, Issue 3, pp. 646-653, 2014.
10. M. Tumer, B. Sarioglu, S. Mutlu, Y. Ulgen, A. Yalcinkaya, C. Ozturk, "Using a Low-amplitude RF Pulse at Echo Time (LARFET) for Device Localization in MRI", *Medical & Biological Engineering & Computing*, vol. 52, issue. 10, pp. 885-894, 2014.
11. Senol Mutlu, Bedri Gurkan Sonmez, "A Solution State Diode Using Semiconductor Polymer Nanorods with Nanogap Electrodes", *Nanotechnology*, 23 (2012) 245203.
12. B. Sarioglu, O. Aktan, A. Oncu, Senol Mutlu, G. Dundar, A.D. Yalcinkaya, "An Optically Powered CMOS Receiver System for Intravascular Magnetic Resonance Applications", *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*, Volume 2, Issue 4, pp. 683-691, 2012.
13. Tugce Nihal Gevrek, Rana Nur Ozdeslik, Gulcan Semra Sahin, Gulen Yesilbag, Senol Mutlu, Amitav Sanyal, "Functionalization of Reactive Polymeric Coatings via Diels–Alder Reaction Using Microcontact Printing", *Macromolecular Chemistry and Physics*, 213, pp. 166-172, 2012.
14. O. Aktan, B. Sarioglu, U. Cindemir, S.O. Unlu, G. Dundar, Senol Mutlu, A.D. Yalcinkaya, "Optoelectronic CMOS Power Supply Unit for Electrically Isolated Micro-Scale Applications", *IEEE Journal of Selected Topics in Quantum Electronics*, Volume 17, Issue 3, pp. 747-756, 2011.
15. Senol Mutlu, Iskender Haydaroglu, A.O. Sevim, "Realization of Polymer Charge Pump Circuits Using Polymer Semiconductors", *Organic Electronics*, v.12, issue 2, pp. 312-321, 2011.
16. Senol Mutlu, A. O. Sevim, "Active Microheater Matrix Using Polymer Semiconductor Diodes for Thermal Patterning," *Journal of Micromechanics and Microengineering*, vol. 20, n. 3, 035019 (8pp), 2010.
17. Y.D. Gokdel, Senol Mutlu, A.D. Yalcinkaya, "Self-Terminating Electrochemical Etching of Stainless Steel for the Fabrication of Micro-Mirrors," *Journal of Micromechanics and Microengineering*, Vol. 20, 095009 (6pp), 2010.
18. Y.D. Gokdel, A.O. Sevim, S. Mutlu, A.D. Yalcinkaya, "Polymer-MEMS-Based Optoelectronic Display", *IEEE Transactions on Electron Devices*, Volume 57, Issue 1, pp. 145-152, 2010.

19. Ali Osman Sevim, Senol Mutlu, "Post Fabrication Electric Field and Thermal Treatment of Polymer Light Emitting Diodes and Their Photovoltaic Responses," *Organic Electronics*, Volume 10, Issue 1, pp. 18-26, 2009.
20. Y.D. Gokdel, B. Sarioglu, Senol Mutlu, A.D. Yalcinkaya, "Design and Fabrication of Two-Axis Micromachined Steel Scanners," *Journal of Micromechanics and Microengineering*, Vol. 19, 075001 (8pp), 2009.
21. Quanzhou Luo, Senol Mutlu, Yogesh B. Gianchandani, Frantisek Svec, and Jean M.J. Frechet, "Monolithic Valves For Microfluidic Chips Based On Thermoresponsive Polymer Gels, " *Electrophoresis*, vol.24, pp. 3694-3702, 2003.
22. Cong Yu, Senol Mutlu, P. Selvaganapathy, Carlos H. Mastrangelo, Frantisek Svec, and Jean M.J. Frechet, "Flow Control Valves For Analytical Microfluidic Chips Without Mechanical Parts Based On Thermally Responsive Monolithic Polymers, " *Analytical Chemistry*, vol.75 No. 8, pp.1958-1961, 2003.
23. Brian D. Jensen, Senol Mutlu, Sam Miller, Katsuo Kurabayashi, James J. Allen, "Shaped Comb Fingers For Tailored Electromechanical Restoring Force, " *IEEE/ASME Journal of Microelectromechanical Systems*, vol.12 No. 3, pp.373-383, 2003.

#### **ISSCC Presentation:**

I. Haydaroglu (Ph.D. Advisor Senol Mutlu), Presentation at the 2016 International Solid State Circuits Conference (ISSCC) Student Research Preview session (Student work in progress), Jan. 31-Feb. 4, San Francisco, CA.

#### **Conference Papers:**

1. E. Iseri and Senol Mutlu, "Realization of Triboelectric Energy Harvesters Using Steel-Polymer Microfabrication Methods", IEEE MEMS 2017 Conference, Las Vegas, USA, Jan. 22-26.
2. O. Ertop, B.G. Sonmez, Senol Mutlu, "Investigation of the Salt Concentration Dependence of Water-Gated Field Effect Transistors (WG-FET) Using 16-nm-Thick Single Crystalline Si Film," 31th. Eurosensors Conference, Paris, France, September 3-6, 2017.
3. O. Ertop, B.G. Sonmez, Senol Mutlu, "Improved repeatability in planar water-gated field effect transistor (WG-FET) with 16-nm-thick single crystalline Si film," 30th. Eurosensors Conference, Budapest, Hungary, September 4-7, 2016 (Oral Presentation).
4. E. Iseri, K.O. Ulgen, C. Yilmaz, Senol Mutlu, "Fabrication of Steel Displacement Amplifiers Integrated to Microfluidic Channels", IEEE MEMS 2016 Conference, Shanghai, China, Jan. 24-28.
5. Engin Baysoy, Dursun K Yildirim, Cagla Ozsoy, Adrienne C Washburn, Anthony Z Faranesh, Senol Mutlu, Robert J Lederman and Ozgur Kocaturk, "Lithography based resonant marker design for MRI catheter visualization", 19<sup>th</sup> Annual Society for Cardiovascular Magnetic Resonance (SCMR) Scientific Sessions, Los Angeles, USA, Jan. 27-30, 2016.
6. Korel Dursun Yildirim, Engin Baysoy, Zahid Sagiroglu, Çağla Özsoy, Ozgur Kocaturk, and Senol Mutlu, "A Novel method for developing clinical grade active devices dedicated to interventional MRI procedures", The International Society for Magnetic Resonance in Medicine (ISMRM) 24th Annual Meeting & Exhibition, 07-13 May 2016, Singapore.
7. Mohammed Beygi, Senol Mutlu, Burak Guclu, "Design and Microfabrication of a Strain-Gauge Array on Polymer Substrate for Tactile Neuroprostheses in Rats", 26th. Micro Mechanics Europe Workshop, MME 2015, Toledo, Spain, September 2015.
8. O. Ertop, B.G. Sonmez, Senol Mutlu, "Realization of a planar water-gated field effect transistor (WG-FET) using 16-nm-thick single crystalline Si film," 28th. Eurosensors Conference, Brescia, Italy, September 2014 (Oral Presentation).

9. E. Iseri, E. Gencturk, M. Gurgen, A.K. Uguz, K.O. Ulgen and Senol Mutlu, "Macro to Microfluidic Channel Integration Using 3D Printing for Laminar Flow Investigation in a Y-Channel," 25th. Micro Mechanics Europe Workshop, MME 2014, Istanbul, Turkey, September 2014.
10. K.M. Turksoy, B. Yaman, I. Terkesli, S. Mutlu, A. Sanyal, "Effect of semiconductor hydrophilicity in electrolyte gated organic field effect transistors", European Polymer Congress 2013, Pisa, Italy, 16-21 June, Poster7-88.
11. B.G. Sonmez, S. Mutlu, "Microfluidic Channel Integrated Solution State Diode Using Semiconductor Polymer Nanorods with Nanogap Electrodes", IEEE Nano, 12<sup>th</sup> International Conference on Nanotechnology, 20-23 August 2012, Birmingham, UK, pp. 284-287.
12. B. Sarioglu, O. Aktan, U. Cindemir, G. Dundar, C. Ozturk, S. Mutlu, A. D. Yalcinkaya, "Optoelectronic CMOS Power Supply Unit for Interventional MRI Devices ", *Proceedings of ISMRM*, 7-13 May 2011, Montreal, Canada.
13. I. Haydaroglu, S. Mutlu, "Energy Harvesting and Data Transmitting Microsystem Using a Light Emitting Diode", *International Conference on Optical MEMS & Nanophotonics*, August 8-11, 2011, Istanbul, Turkey.
14. B. Sarioglu, O. Aktan, U. Cindemir, S. Mutlu, G. Dundar, A.D. Yalcinkaya, "An RF Front-End with Optically Powered CMOS Power Supply", *International Conference on Optical MEMS & Nanophotonics*, August 8-11, 2011, Istanbul, Turkey.
15. B.K. Usta, Y.D. Gokdel, S. Mutlu, A.D. Yalcinkaya, "Selectively Thinned Stainless Steel Scanners through Electrical Discharge Machining", *International Conference on Optical MEMS & Nanophotonics*, August 8-11, 2011, Istanbul, Turkey.
16. Y.D. Gokdel, A.O. Sevim, B. Kucukakarsu, S. Mutlu, A.D. Yalcinkaya, "PLED integrated FR4 MEMS Display", *Proceedings of IEEE Photonics Society (LEOS)*, October 2009, Antalya, Turkey, pp. 71-72.
17. Orhan Mert, Senol Mutlu, "Self-Aligned Polymer Thin Film Transistors Fabricated Using Backside Exposure," The 5<sup>th</sup> International Thin Film Transistor Conference, ITC 2009, Paris, France, March 2009, pp. 102-105.
18. Y.D. Gokdel, B.Sarioglu, Senol Mutlu, A.D. Yalcinkaya, "Two-Axis Micromachined Steel Scanners," 19th. Micro Mechanics Europe Workshop, MME 2008, Aachen, Germany, September 2008. pp. 177-180.
19. Ali Osman Sevim, Şenol Mutlu, "MEH-PPV Based Polymer Passive Matrix Display Fabrication Using All Wet Etching and Lithographic Processes," 19th. Micro Mechanics Europe Workshop, MME 2008, Aachen, Germany, September 2008, pp. 419-422.
20. Ali Osman Sevim, Şenol Mutlu, "Post Fabrication Electric Field Treatment of Polymer Light Emitting and Photovoltaic Devices," *Proceedings of 4th. Ph.D. Research in Microelectronics and Electronics (PRIME) 2008*, Istanbul, Turkey, pp. 17-20.
21. M. Tabib-Azar, R. Wang, Senol Mutlu, Carlos Mastrangelo and Y. B. Gianchandani, "Microfabricated Gate-Modulated Electrochemical Ion Spectroscopy Sensor," *Proc. Transducers 2007 Conference*, Lyon, France, June 10-14, pp. 2307-2310.
22. Massood Tabib-Azar, Yan Xie, Senol Mutlu, Carlos Mastrangelo and Run Wang, "Ion Spectroscopy Using Microfluidic FlowFETs," *ECS Trans.*, vol. 3, issue 10, 2006, pp. 35-42.
23. Senol Mutlu, A. Basu and Yogesh B. Gianchandani, "Maskless Electrochemical Patterning of Gold Films for BioSensors Using Micromachined Polyimide Probes," Presented in *IEEE Sensors 2005 Conference*, Irvine, California, USA, Oct. 31-Nov. 3.
24. Jong M. Park, Senol Mutlu, Yogesh B. Gianchandani, "Nano-Scale Abrasion Studies of Materials Used in MEMS Devices and Packages, " Accepted to *Proceedings of IMECE05, 2005 ASME*



*International Mechanical Engineering Congress and Exposition*, November 5-11, Orlando, Florida, USA.

25. Senol Mutlu, Frantisek Svec, Carlos H. Mastrangelo, Jean M.J. Frechet, and Yogesh B. Gianchandani, "Enhanced Electro-Osmotic Pumping With Liquid Bridge and Field Effect Flow Rectification," Presented in *IEEE MEMS 2004 Conference*, Maastricht, The Netherlands, Jan. 25-29, pp. 850-853.
26. Senol Mutlu, Cong Yu, Frantisek Svec, Carlos H. Mastrangelo, Jean M.J. Frechet, and Yogesh B. Gianchandani, "A Thermally Responsive Polymer Microvalve Without Mechanical Parts Photo-Patterned In A Parylene Channel," *Proc. Transducers 2003 Conference*, Boston, Massachusetts, USA, June 8-12, pp. 802-805.
27. Senol Mutlu, P. Selvaganapathy, Cong Yu, Frantisek Svec, Carlos H. Mastrangelo, Jean M. J. Frechet, "Micromachined Porous Polymer For Bubble Free Electro-Osmotic Pumping," Presented in *Proc. IEEE MEMS 2002 Conference*, Las Vegas, USA, Jan. 20-24, pp. 19-22.
28. Brian D. Jensen, Senol Mutlu, Sam Miller, Katsuo Kurabayashi, James J. Allen, "Design and Simulation Of Shaped Comb Fingers For Compensation Of Mechanical Restoring Force In Tunable Resonators," *Proceedings of 2001 ASME International Mechanical Engineering Congress and Exposition*, November 11-16, New York, NY, USA.

#### **Supervised Ph.D. Thesis:**

1. Bedri Gurkan Sonmez, *Realization and Modeling of Water-Gated Field Effect Transistors (WG-FET) Using 16-nm-Thick Single Crystalline Silicon Film and Their Circuit Applications*, 2017.
2. Iskender Haydaroglu, *Energy Harvesting Wireless Optical Microsystems*, 2016.

#### **Ph.D. Thesis Being Supervised:**

1. Ozan Ertop, on-going.
2. Ismail Kara, *IC Design for Triboelectric Energy Harvesting*, on-going.
3. Betül Küçükakarsu Usta, on-going.
4. Ismail Terkesli, on-going.

#### **Supervised M.Sc. Thesis:**

1. Doruk Dunder, *Water-Gated Field Effect Transistor with Integrated Microfluidic Channel*, M.Sc. Thesis, Bogazici University, Istanbul, 2017.
2. Mohammed Beygi, *Design and Microfabrication of a Strain-Gauge Array on Polymer Substrate for Tactile Neuroprosthesis in Rats*, M.Sc. Thesis, Bogazici University, Istanbul, 2016.
3. Emre Iseri, *Realization of microfluidic devices with steel displacement amplifiers for cell culturing and analysis*, M.Sc. Thesis, Bogazici University, Istanbul, 2015.
4. Zahid Sagiroglu, *Design and simulation of straight and tilted helical coils for magnetic resonance imaging*, M.Sc. Thesis, Bogazici University, Istanbul, 2015.
5. Ozan Ertop, *Fabrication and Characterization of a Planar Water Gated Field Effect Transistor Using 16 Nanometer Thick Single Crystalline Silicon Film*, M.Sc. Thesis, Bogazici University, Istanbul, 2014.
6. Burak Arıcıoğlu, *Wireless and Batteryless Instant Velocity Sensor for Certain Daily Motions*, M.Sc. Thesis, Bogazici University, Istanbul, 2014.
7. Farshid Taleb Sis, *A Novel Biosensor Based on a Planar Water Gated Organic Field Effect Transistor Using Biotin Functionalized Polythiophene*, M.Sc. Thesis, Bogazici University, Istanbul, 2013.

8. Ibrahim Gokhan Haciahmetoglu, *Thermoelectrical Properties of Polythiophene (P3HT) Thin Film Polymers*, M.Sc. Thesis, Bogazici University, Istanbul, 2013.
9. Berkan Yaman, *Fabrication and Characterization of Liquid Electrolyte Gated Polymer Field Effect Transistor for Basic Circuit Applications*, M.Sc. Thesis, Bogazici University, Istanbul, 2013.
10. Ismail Terkesli, *Sensor Applications of Polymer Field Effect Transistors*, M.Sc. Thesis, Bogazici University, Istanbul, 2013.
11. Gurkan Bedri Sonmez, *Liquid State Diodes Using Semiconductor Polymers*, M.Sc. Thesis, Bogazici University, Istanbul, 2011.
12. Mehmet Usta, *VGA Projection Display Using Electromagnetically Actuated Steel Micromirrors*, M.Sc. Thesis, Bogazici University, Istanbul, 2011.
13. Orhan Mert, *Fabrication and Testing of Polymer Transistors for Basic Digital Circuits*, M.Sc. Thesis, Bogazici University, Istanbul, October, 2009.
14. Iskender Haydaroglu, *Realization of Charge Pump Circuits Using Polymer Semiconductors*, M.Sc. Thesis, Bogazici University, Istanbul, October, 2009.
15. Ali Osman Sevim, *Flexible Polymer Display Technologies*, M.Sc. Thesis, Bogazici University, Istanbul, March 2008.

#### **Turkish Papers:**

- E. Baysoy, D.K. Yıldırım, Ç. Özsoy, Z. Sağıroğlu, Ö. Kocatürk, “Pediatrik Hastalarda Konjenital Kalp Rahatsızlıklarının MRG Altında Tedavisinde Kullanılmak Üzere İnce Film Tabanlı ve 5 Fr Yarı Aktif Kateter Tasarımı”, *Süleyman Demirel Üniversitesi Fen Bilimleri Enstitüsü Dergisi*, DOI-10, 2017.
- Orhan Mert, Senol Mutlu, "Organik Elektronik", *Endüstri ve Otomasyon*, issue 145, Kasım 2008, pp 35-40.
- B. Gurkan Sonmez, Senol Mutlu, “Polimer Yarıiletken Kullanılarak Mikro Akışkan Kanal ile Tümlüşik Çözelti Bazlı Işık Yayan Diyot Oluşturulması”, 14. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, 14 Eylül 2012, İstanbul, sayfa 49-50.
- B. Gurkan Sonmez, Senol Mutlu, “Liquid Polymer Diodes with Nanoscale Electrode Separation”, *7th Nanoscience and Nanotechnology Conference*, Haziran 2011, İstanbul.
- B. Gurkan Sonmez, Senol Mutlu, “Polimer Yarı-iletken Kullanarak Sivi Isık Yayan Diyot (LED) Oluşturulması”, 12. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, 8 Ekim 2010, İstanbul, sayfa 55-56.
- B. Sarioglu, O. Aktan, U. Cindemir, G. Dundar, S. Mutlu, A.D. Yalcinkaya, “Kompakt CMOS Optoelektronik Güç Ünitesi”, 12. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, 8 Ekim 2010, İstanbul, sayfa 63-64.

#### **Patent**

- Senol Mutlu, P. Selvaganapathy, C. Yu, F. Svec, J. M. J. Frechet, C. H. Mastrangelo, “Porous Polymers: Composition And Uses Thereof,” U.S. Patent Application No.: 20030232203.
- Senol Mutlu, “Pasif Matris Format Halinde Dizili Elektrik Elemanlarının Değerlerinin Tam Olarak Bulunmasını Sağlayan Bir Sistem,” Turkish Patent Applied, 30059.14, 2016.
- Cengizhan Ozturk, Arda Deniz Yalcinkaya, Murat Tumer, Senol Mutlu, “Tıbbi cihaz takibi için MR düzenegi,” Turkish Patent No.: 2011 123000.

## **HONORS AND AWARDS**

- 2015 The Science Academy Young Scientist Award (BAGEP), Turkey
- 2014 Middle Eastern Technical University Prof. Dr. Mustafa N. Parlar Research Encouragement Award
- Recipient of 2008, 2009, 2010, and 2011, 2012, 2013, 2014, 2015 Bogazici University Academic Encouragement Award
- Awarded 5 year guaranteed funding for Ph.D. study by the Electrical Engineering department of the University of Michigan (2000).
- Full scholarship recipient for B.Sc. Degree in the U.S. awarded by the Turkish Government (1996).
- Ranked 76th in the 1995 University Placement Test in Turkey out of about 1 million students (1995).
- Candidate for the Turkish Team in International Physics Olympiads (1995).
- Ranked 23rd in the High School Placement Test in Turkey out of about 1 million students (1992).

## **REVIEW SERVICES**

- IEEE Journal of Microelectromechanical Systems (JMEMS).
- IEEE Transactions on Nanotechnology.
- Journal of Micromechanics and Microengineering
- IOP Journal of Physics D
- Sensors And Materials
- Journal of Electrostatics

## **TECHNICAL SKILLS**

- 17 year semiconductor processing experience including lithography, mask making, thin film deposition, reactive ion etch (RIE), chemical vapor deposition, high-aspect ratio silicon deep RIE, silicon-glass anodic bonding, anisotropic etching of silicon with KOH and device/material characterization using Dektak surface profilometer, Zygo surface interferometer and scanning electron microscopy (SEM).
- CMOS circuit design for energy harvesters.
- SOI wafer experience on the realization of a high performance transistor with 16 nm thick single crystalline silicon film.
- Fabrication and characterization of polymer light emitting diodes, diodes and transistors using semi-conducting (P3HT, MEH-PPV) and conducting (PEDOT:PSS) polymers.
- Experience in silicon-on-glass (SOG) process intended for integration of CMOS with capacitive sensors and actuators such as accelerometers, gyroscopes, resonators and combdrives. Refined and characterized process steps, prepared documentation and layout design rules.
- Polymer processing and low temperature material processing. Experience in thin film processing and fabrication of parylene structures and devices as well as SU-8 and PDMS.
- Developed thin film formation and micromachining of a porous polymer.

- Microfabricated a new device, porous plug electro-osmotic pump, by integrating porous polymer into parylene fabrication process. This pump is compact, has no moving parts and large-scale integratable.
- Studied electrochemistry of a two-electrode-electrolyte system. Experience in electrochemical etching for nano/micro fabrication.
- Developed thin film formation and micromachining of a thermally responsive polymer.
- Microfabricated an inline valve with the thermally responsive polymer by integrating to parylene channels.
- Developed macro to micro fluidic interconnection setup and microfluidic device testing and control system.
- Experience in surface micromachined scanning thermal probe with parylene.

### ***COURSEWORK OVERVIEW***

CMOS fabrication technology, analog and digital circuit design, MEMS sensor and actuator design, micromachining technology, solid-state semiconductor fundamentals, microprocessors and controllers, Digital circuit design with ARM and FPGA.

**Relevant Design Projects:** Design and Simulation of Shaped Comb Fingers for Compensation of Mechanical Restoring Force, Surface Micromachined Capacitive Accelerometer With Closed-Loop Feedback, Fabrication, Testing and Characterization of MOSFETs in 1- $\mu\text{m}$  technology, A 6-bit 800M Sample/s A/D Converter in 0.35- $\mu\text{m}$  CMOS, 16 bit Microcontroller in 0.5- $\mu\text{m}$  CMOS, A Monolithic Two-Stage Op-Amp.

### ***COMPUTER SKILLS***

**Operating Systems:** UNIX, DOS, Windows, Android.

**Programming Languages:** C/C++, Assembly, VHDL.

**Special:** Matlab, Femlab, CoventorWare, Cadence, HSpice, Mentor Graphics, Maxwell, Xilinx ISE, Altera Monitor Program, ARM assembly compiler.