

Matthew Spencer

Harvey Mudd College // 301 Platt Blvd. // Claremont, CA 91711 // 515-231-2743 // mspencer at g hmc edu

- INTERESTS MEMS circuits, devices, simulation and modeling. Digital and mixed-signal circuit design.
- EDUCATION **University of California, Berkeley**, Berkeley, CA
- Doctorate in Electrical Engineering* **Aug 2008 – Aug 2015**
Dissertation: “Design Considerations for Nano-Electromechanical Relay Circuits.”
Advised by Professor Elad Alon
- Massachusetts Institute of Technology**, Cambridge, MA
- Master of Electrical Engineering* **Jun 2007 – Jun 2008**
Bachelor of Electrical Engineering **Sep 2003 – Jun 2007**
Minor in Materials Science and Engineering
- EXPERIENCE **Harvey Mudd College**, Claremont, CA **Aug 2014 – Present**
- Taught courses on Digital Design, Microcontroller Systems, Analog Design, Radio Frequency Circuits, Experimental Practice and Field Deployment and System Modeling.
 - Advised undergraduate students as they pursued industry-sponsored projects including designing satellite payloads, RF shielding for consumer electronics, laser diode burn-in systems, aquatic robots and multi-GHz multiplexers.
 - Pursued research in sequential logic for micromechanical circuits, phase change memory systems, PCB ground plane optimization and ultrasound communications.
- University of California Berkeley**, Berkeley, CA **Aug 2008 – Aug 2014**
- Designed digital circuits using micromechanical devices while developing new architectures to take advantage of the low device leakage and minimize the effect of long device delay.
 - Taped out and tested ten test chips containing custom MEM relay-based circuits, test structures and VLSI systems. Demonstration systems included adders, decoders, memory arrays, novel sequential logic and microcontroller datapaths.
 - Developed mixed-physics simulator model of the micromechanical relay to expedite circuit design. Integrated simulation model with standard CAD tools: Cadence, Calibre and Spectre.
- Texas Instruments DLP**, Plano, TX **May 2012 – Aug 2012**
- Wrote circuit-level simulation models for emerging MEMS devices.
 - Developed software to assist in characterization and data processing for the new devices.
 - Helped guide testing and fabrication of MEMS device.
- Intel Components Research**, Portland, OR **May 2011 – Aug 2011**
- Wrote models and simulation scripts for emerging devices which combined atomistic simulation results with industrial tool flow.
 - Used models to compare emerging technology against CMOS at digital system level.
- AWARDS Best Presentation and 2nd Best Paper in First Year Programs Division of ASEE 2017
Demetri Angelakos Award for Altruism, UC Berkeley EECS, 2013
Intel Fellowship, Intel, 2012
Jack Raper Outstanding Technical Directions Paper Award, ISSCC 2011
UC Berkeley Outstanding Graduate Student Instructor for 2011
EECS Outstanding Graduate Student Instructor for 2011
- SELECTED PUBLICATIONS **Integrating Theory and Hands-On Practice using Underwater Robotics in a Multidisciplinary Introductory Engineering Course.**
Proceedings of the American Society of Engineering Education Conference, 2017
Nancy Lape, Lori Bassman, Christopher Clark, Albert Dato, Angela Lee, Matthew Spencer, Erik Spjut, Laura Palucki Blake
Demonstration of Integrated Micro-Electro-Mechanical Relay Circuits for VLSI Applications.
IEEE Journal of Solid State Circuits, Vol. 46, Iss. 1, Jan. 2011.
Matthew Spencer, Fred Chen, Cheng C. Wang, Rhesa Nathanael, Hossein Fariborzi, Abhinav Gupta, Hei Kam, Vincent Pott, Jaeseok Jeon, Tsu-Jae King Liu, Dejan Markovic, Elad Alon, Vladimir Stojanovic,