

Scott P. Lerner

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- EDUCATION
- ◇ **Ph.D., Electrical Engineering**, GPA: 4.0, (expected graduation 2018).
Drexel University, Philadelphia, PA.
 - ◇ **B.S., Electrical Engineering**, GPA: 3.5, 2014.
Drexel University, Philadelphia, PA.
 - ◇ **B.S., Computer Engineering**, GPA: 3.5, 2014.
Drexel University, Philadelphia, PA.
- PROFESSIONAL EXPERIENCE
- ◇ **Low-Power Design Engineering Ph.D. Intern**, (June 2015 – September 2015)
Advanced Micro Devices
Austin, TX, USA
 - Responsible for designing Low-Power Clock Tree Synthesis trials for:
 - Clock Mesh Optimization
 - Clock Buffer Optimization
 - Clock Slew Optimization
 - Created Near-Threshold Variation Analysis guidelines for next-generation tapeouts
 - Characterization of novel low-power variation-tolerant flip flop for near-threshold operation

 - ◇ **Research Fellow / Ph.D. Student**, (September 2014 – current)
VLSI Laboratory, Department of Electrical and Computer Engineering
Drexel University, Philadelphia, PA, USA
 - Ph.D. student and member of the VLSI lab
 - NSF GRFP recipient for research on Hardware resilience
 - Published about linear timing models for clock buffers
 - Studying Low-power circuits using the following techniques:
 - Clock Gating with delay estimates and optimal sizing
 - Low-power, high-performance enabled by low-swing circuits
 - Investigating Physical Design resilience by using Software workload-awareness

 - ◇ **Undergraduate Research Assistant – VLSI Laboratory**, (January 2012 – August 2014)
VLSI Laboratory, Department of Electrical and Computer Engineering
Drexel University, Philadelphia, PA, USA
 - NSF Research Experience for Undergraduate (REU) grant
 - Clock tree mesh optimization algorithms (500 lines C++)
 - Implemented an advanced algorithm for clock buffer sizing (700 lines C++)
 - Custom VLSI Design, ASIC Design I/II, Network-on-Chip, Computer Architecture courses
 - Cadence: RTL Compiler, Encounter, Virtuoso, Spectre
 - Synopsys: 1) DC for synthesis, 2) ICC for physical design floorplanning, placement, routing, CTS,
 - 3) Primitime for Static Timing Analysis 4) HSPICE for simulation
 - BookSim, HNoC for Network-on-Chip simulation
 - Senior Design Project on Wireless Interconnect Design for 2D and 3D ICs
 - NoC simulation, HFSS modeling, RF and Antenna modeling

- ◇ **Undergraduate Research Assistant – DPAC Laboratory**, (January 2012 – August 2014)
DPAC Laboratory, Department of Electrical and Computer Engineering
Drexel University, Philadelphia, PA, USA
 - Validated binary instrumentation error compared to full-system simulation
 - Network-on-Chip design space exploration of resource optimization
 - Automated verification testing for CPU event traces
- ◇ **Co-op Technical Senior**, (April 2013 – September 2013)
Lockheed Martin
Cherry Hill, NJ, USA
 - Optimized software defined radios for spectrum denial capabilities
 - Formulated programs to allow for large data sets to be analyzed quickly
 - Obtained and maintained a **Secret level security clearance**
- ◇ **DRAM Product Engineer**, (March 2011 – September 2011)
Micron Technologies Inc.
Boise, ID, USA
 - Performed functional testing and verification on packaged and bare memory die
 - Diagnosed part failures for physical design and signal integrity issues
 - Worked with a team to brainstorm and apply innovative fixes to new products

- PUBLICATIONS
- ◇ C. Sitik, W. Liu, S. Lerner, E. Salman, and B. Taskin, *An Improved Methodology for Low Voltage Gated Clock Tree Synthesis*, submitted to International Symposium on Physical Design (ISPD) 2016.
 - ◇ R. Rachala, S. Lerner, and S. Kosonocky, *Design Techniques for Clock Tree Synthesis at Near-Threshold Voltages*, in preparation for Design Automation Conference (DAC) 2016.
 - ◇ C. Sitik, W. Liu, S. Lerner, E. Salman, and B. Taskin, *Low Swing Clock Tree Synthesis with Local Gate Clusters*, in preparation for a journal submission.
 - ◇ S. Nilakantan, S. Lerner, M. Hempstead and B. Taskin, *Can you trust your memory trace?: A comparison of memory traces from binary instrumentation and simulation*, Nominated for best paper at the IEEE International Conference VLSID, pp.135-140 January 2015.
 - ◇ Can Sitik, Scott Lerner and Baris Taskin, *Timing Characterization of Clock Buffers for Clock Tree Synthesis*, Proceedings of the IEEE International Conference on Computer Design (ICCD), pp.230-236 October 2014.

- SELECTED PROJECTS
- ◇ **BrainBit: Wireless EEG Monitor, DragonHacks 2015**
 - Designed signal conditioning circuit with 1000x amplification
 - Produced new low-bandwidth bluetooth communication protocol
 - Created a 3D model for an initial prototype
 - ◇ **Leap Motion-Controlled Electric Wheelchair, Philly Codefest – Dean’s Choice Award**
 - Programmed communication circuitry to interface between XBee and DC Motors
 - Designed Low Power motor control using Arduino
 - Presented prototype to Venture Capitalists
 - ◇ **Machine Learning Quadcopter, Lerner Research Labs**
 - Using Machine Learning algorithms to identify surveillance targets
 - Precise control of battery for extended mission flights
 - Developed optimization equations related to hardware tradeoffs

PRESENTATIONS

- ◇ C. Sitik, S. Lerner, and B. Taskin, *Timing Characterization of Clock Buffers for Clock Tree Synthesis*, Presentation given at IEEE International Conference on Computer Design (ICCD), Oct 2014.

- ◇ S. Lerner, V. Pano, and B. Taskin, *Wireless Network on Chip*, Poster presented at Mid-Atlantic ASEE, November 2014.
- ◇ S. Lerner, *Arduino Robotics in the Classroom*, Poster presented at Mid-Atlantic ASEE, November 2014.
- ◇ S. Lerner, and B. Taskin, *Low-Power Clock Network Designs*, Poster presented at IEEE Design Automation Conference, June 2014.
- ◇ Scott Lerner, R. Welliver, B. Derveni, C. Schoenfield, I. Yilmaz , *MotionExplorer, A Leap Motion-Controlled Electric Wheelchair*, presented at Philly Codefest, February 2014.
- ◇ Can Sitik, Scott Lerner, and Baris Taskin, *Low-Power/High-Performance Clock Network Design for Microprocessors*, Poster presented at Upsilon Pi Epsilon Research Reception, February 2013.
- TEACHING ASSISTANT COURSEWORK ◇ Advanced Programming, Winter 2014-15, Junior Level Class
- ◇ Embedded Systems, Fall 2014-15, Junior Level Class
- ◇ Introduction to Computer Networks, Fall 2014-15, Junior Level Class
- ◇ Design with Microcontrollers, Summer 2013-14 Junior Level Class
- ◇ Network-on-chip I, Fall 2013-14, Graduate Level Class
- ◇ ASIC Design II, Spring 2013-14, Graduate Level Class
- PROFESSIONAL ACTIVITIES ◇ Technical Chair - Drexel IEEE Graduate Society 2014-Current
- ◇ Member - Drexel IEEE Undergraduate 2013, 2014
- ◇ Student Member - Institute of Electrical and Electronics Engineers 2010-Current
- VOLUNTEER ACTIVITIES ◇ STAR Mentor - Low-power Circuit Design, Drexel University 2013-14
- ◇ Freshman Design Mentor - Wireless HDMI, Drexel University 2013-14
- ◇ TechGirlz Workshop held in Philadelphia, PA
- ◇ SeaPerch Underwater Robotics Challenge 2014 held in Philadelphia, PA
- ◇ Biomedical Sciences and Professional Studies Graduate Orientation 2014 held in Philadelphia, PA
- ◇ City Year Park Cleanup in Philadelphia, PA
- SKILLS ◇ C, C++, Python, Objective-C (10,000+ lines written)
- ◇ Pthread, OpenMP, Tcl, Assembly (MIPS), SystemC (1,000+ lines written)
- ◇ Verilog HDL, Matlab, Arduino, L^AT_EX (1,000+ lines written)
- ◇ Synopsys – Design Compiler, IC Compiler, HSpice
- ◇ Cadence – RTL Compiler, Encounter, Virtuoso Suite, Spectre, PSpice
- ACADEMIC HONORS AND AWARDS ◇ **NSF Graduate Research Fellowship (GRFP) Program Recipient, 2015.**
- ◇ National Defense Science & Engineering Graduate (NDSEG) Recipient (**declined**), 2015.
- ◇ NSF Research Experience for Undergraduate (REU) Grant 2014
- ◇ A. Richard Newton Young Fellow Award 2014
- ◇ Dean’s Choice Award at Philly Codefest for MotionExplorer 2014 held in Philadelphia, PA.
- ◇ NextFab Innovation Award at Philly Codefest for MotionExplorer 2014 held in Philadelphia, PA.
- ◇ Doctor Thomas Moore Endowed Grant 2014
- ◇ Dean’s List, 2009, 2010, 2011, 2012, 2013, 2014.
- REFERENCES ◇ **Dr. Baris Taskin**
Associate Professor, Department of Electrical and Computer Engineering
Drexel University, Philadelphia, PA
E-mail: taskin@coe.drexel.edu
- ◇ **Dr. Mark Hempstead**
Associate Professor, Department of Electrical and Computer Engineering
Tufts University, Medford, MA
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