DENNIS RICH

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EDUCATION

Stanford University GPA: 3.97/4.0
Ph.D - Electrical Engineering Expected June 2024

University of Illinois at Urbana-Champaign GPA: 4.0/4.0
Dual B.S. - Electrical Engineering and Engineering Physics Conferred May 2019 with Highest Honors

RESEARCH EXPERIENCE

Robust Systems Group Stanford University, May 2019 - Present

- Automated IC power and thermal analysis flow with McPAT, 3D-ICE, COMSOL, Cadence Celsius, Python, and more
- Developed new physical design methods leading to over 50% 3DIC junction temperature reduction
- Performed LabView workbench IC characterization of 1.4Mb phase-change memory arrays to investigate new write strategies

Innovative Compound Semiconductor Lab University of Illinois, October 2015 - March 2019

- Led lab members to develop new CMOS fabrication processes
- Programmed MATLAB analysis tool with user interface for theoretical stress-induced cracking calculations
- Fabricated and characterized semiconductor devices with e-beam, profilometry, and more in cleanroom environment

Silicon Labs, Inc. Nashua, NH (Timing Division), May 2017 - August 2017

- Designed new splitting techniques for preserving signal integrity in PCB-based transmission lines
- Analyzed and diagnosed circuitry and layout deficiencies in phase-locked loop designs

Patankar Research Group Northwestern University, May 2014 – August 2014

- Collected and analyzed molecular data of waterproof system with C++

Mesoscopic Physics Group Northwestern University, May 2013 – August 2013

- Synthesized and analyzed carbon nanotube MEMS devices with CVD, AFM, and chemical analysis

SKILLS

Software

Python: pandas, seaborn, multi-threading • tcsh • Some Tcl, Perl

Electronic Devices
COMSOL Heat Transfer • Lumerical

Electronic Systems
Celsius • Virtuoso • McPAT • Autodesk Inventor

Laboratory

Fabrication: E-beam, photolithography, masked wet etching, electroplating, mechanical thin-film separation

Characterization: Testbench, AFM, SEM, Profilometry, Raman spectroscopy, Nomarski microscopy

AWARDS AND HONORS

Edward J. McCluskey Graduate Fellowship - Awarded to Ph.D students in computer architectures	2019-2020
Goldwater Scholarship - Nationally competitive award of $7,500 per year to 240 promising researchers	2017-2019
SPIE BACUS Scholarship - $5,000 awarded to one promising graduate student in optics and photonics	2019
Bardeen Undergraduate Award - One outstanding senior selected for excellence in semiconductor research	2019
Robert C. MacClinchie Scholarship - $30,000 awarded to one senior for leadership and academic merit	2018
Campus Honors Program Outstanding Senior - Awarded to 16 members of highest honors program at UIUC	2018
Michael E. Napier Memorial Award - One junior selected annually for excellence while working	2018

PUBLICATIONS AND PRESENTATIONS

Published

Heterogeneous 3D Nano-systems: The N3XT Approach?
Dennis Rich et. al. in *NANO-CHIPS 2030: On-Chip AI for an Efficient Data-Driven World*, B. Murmann, Springer (2020)

The Thermodynamics of Restoring Underwater Superhydrophobicity
Paul Jones, Adrian Kirn, Y. David Ma, **Dennis Rich**, and Neelesh Patankar. *Langmuir* (2017) *33* (11)

Expected

Fixing Monolithic 3D's Thermal BEOL Bottleneck with Scaffolding
Dennis Rich, Mehdi Ashegi, Subhasish Mitra et al. Expected publication March 2022.

Presentations

N3XT Heterogeneous Integration: From Lab to Fab
Dennis Rich, Robert Radway, Subhasish Mitra et al. *SystemX November Conference* 2019

Controlling Phase Change: Drying-Up Under Water or Staying Wet During Boiling
Paul Jones, Adrian Kirn, **Dennis Rich**, Ashley Elliot, Neelesh Patankar. *Bull. Am. Phys. Soc.* (2014) *59*