Noah P. Allen

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EDUCATION

Doctor of Philosophy in Electrical Engineering – Electronics ***Expected Graduation December 2018***
Virginia Tech, Blacksburg, Virginia
Research Topic: Understanding the effect of carbon contamination in GaN drift layers for power devices

Master of Science in Electrical Engineering – Electronics ***December 2014***
Virginia Tech, Blacksburg, Virginia
Thesis Title: "Electrical Characterization of Ruthenium Dioxide Schottky Contacts on GaN"

Bachelor of Science in Electrical Engineering ***May 2009***
Georgia Institute of Technology, Atlanta, Georgia

RESEARCH INTERESTS

Understanding non-idealities in semiconductor device operation through electrical and optical characterization methods with a focus on power semiconductor materials and devices

RESEARCH EXPERIENCE

Graduate Researcher, Graduate Program at Virginia Tech ***January 2010 to Present***
Virginia Tech, Blacksburg, Virginia
Research Mentor: Louis Guido, PhD

- Project: Understanding the effects and origin of deep-level traps in GaN power devices introduced during MOCVD growth
- Fabricate Schottky and PN diodes in a cleanroom environment capable of large breakdown voltages and low on-resistances
- Utilize optical and electrical characterization methods (DLTS, SSPC, IV, CV etc.) to explain deviations from ideal operation

Summer Intern, Electronic Systems Sector at Northrop Grumman ***May 2010 to August 2010***
Northrop Grumman Advanced Technology Labs, Baltimore, MD
Internship Mentors: Monica Lilly and Joe Payne, PhD

- Created high resolution Raith E-Beam lithography process to minimize CNTFET channel
- Produced a DUV process for higher resolution photolithography and assisted colleagues with SEM imaging

Undergraduate Researcher, NNIN REU Program at Cornell NanoScale Facility ***May 2008 to August 2008***
Cornell University, Ithaca, NY
Research Mentor: Mr. Donald Tennant

- Project: "Using Near-field Holography to Investigate Super Hydrophobic Surfaces"
- Created high resolution resist process for near-field holography system in the attempt to study its application for super hydrophobic surfaces

Undergraduate Researcher, Georgia Tech Research Institute Nanotechnology Lab ***August 2007 to May 2009***
Georgia Institute of Technology, Atlanta, Georgia
Research Mentor: W. Jud Ready, PhD

- Project: "Correlation of Design Parameters in Carbon Nanotube-Based Supercapacitors"
- Structured the use of carbon nanotubes in electro-chemical double layer capacitors in such a way that will improve modern supercapacitors

PUBLISHED WORK

- ***[In Progress]*** Allen, Noah, et al. "*Modeling forward and reverse IVT Schottky characteristics on GaN with a Log-Normal barrier height distribution"*
- ***[In Progress]*** Allen, Noah, et al. "*Impact of increasing TMGa and Silane on GaN carrier concentration and deep level defects by metal organic chemical vapor deposition*"
- Wang, Jingshan, et al. *"Thin-film GaN Schottky diodes formed by epitaxial lift-off" Applied Physics Letters* 110.17 (2017): 173503.
- Chern, Kevin T., et al. "*GaInN/GaN solar cells made without p-type material using oxidized Ni/Au Schottky electrodes.*" *Materials Science in Semiconductor Processing* 55 (2016): 2-6.
- Nguyen, Peter D., et al. "*Heteroepitaxial Ge MOS Devices on Si Using Composite AlAs/GaAs Buffer*." *IEEE Journal of the Electron Devices Society* 3.4 (2015): 341-348.
- Chern, Kevin T., et al. "*GaInN/GaN-Ni/Au transparent conducting oxide Schottky barrier solar cells*." *Photovoltaic Specialist Conference (PVSC), 2014 IEEE 40th*. IEEE, 2014.
- Allen, Noah, et al. "*Paper-based capacitive mass sensor*." *Sensors, 2011 IEEE*

TEACHING & MENTORING EXPERIENCE

Instructor, Electrical Engineering Department at Virginia Tech ***Summer I 2016***
Course Titles: (ECE 2004) Electric Circuit Analysis

- Introduced basic laws and analysis techniques for electric circuits

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TEACHING & MENTORING EXPERIENCE (CONTINUTED)

Instructor, Electrical Engineering Department at Virginia Tech — ***Summer II 2015***
Course Titles: (ECE 2204) Electronics
- Introduced concepts of non-linear electronic devices including theory, biasing and circuit design.

Instructor, Engineering Education Department at Virginia Tech — ***Summer I/II 2014***
Course Title: (ENGE 1104) Exploration of Digital Future — ***Summer I 2013*** *(2)*
- *(1)*Successfully introduced the use of LabVIEW myDAQ as a tool for teaching electric circuit theory and computer programming — ***Spring 2013***
- *(2)*Designed and implemented Arduino-based microcontroller workshops as a means for introducing embedded programming and circuit design — ***Summer II 2012*** ***Summer II 2011*** *(1)*

Teaching Assistant, Electrical Engineering Department at Virginia Tech — ***Summer I 2012***
Course Titles: (ECE 2504/3544) Intro. To Computer Engineering / Digital Design I
Instructor: Jason Thweatt
- Provided support for two courses answering questions, validating lab assignments and grading homework, tests and projects

Graduate Mentor, Electrical Engineering Department at Virginia Tech — ***Fall 2012***
Student: Evan Clinton (ECE Junior) — ***Spring 2012***
- Mentored undergraduate student in the area of semiconductor characterization techniques
- Guide student in the practices of IV, IVT, and CV electrical measurements along with the data analysis for characterizing Gallium Nitride Schottky diodes
- Advise student on final presentation encompassing work done during semester

Teaching Assistant, Electrical Engineering Department at Virginia Tech — ***Spring 2011***
Appointment: Electronics/Circuit Support Group — ***Fall 2012***
Advisor: Dennis Sweeney, PhD
- Fielded questions pertaining to 7 undergraduate circuit analysis and electronics courses along with providing support for the MATLAB and PSPICE software packages

Teaching Assistant, Engineering Education Department at Virginia Tech — ***Fall 2012***
Course Title: (ENGE 1024) Engineering Exploration
Instructors: Jaime De La Reelopez, PhD / Kacie Hodges, PhD / Holly Matusovich, PhD
- Instructed three lab sections where the engineering design process, scientific method and professional ethics topics and applications were covered

Student Worker, Engineering Education Department at Virginia Tech — ***Summer I/II 2011***
Advisor: Tom Walker
- Employed by Engineering Education Department to create LabVIEW myDAQ projects used to demonstrate different Electrical and Computer Engineering practices

Teaching Assistant, Engineering Education Department at Virginia Tech — ***Spring 2011***
Course Title: (ENGE 1104) Exploration of Digital Future
Instructor: Tom Walker
- Introduced students to computer and software based technologies in a lab setting
- Received highest evaluation as a teaching assistant during semester

AWARDS & ACTIVITIES

- Bradley Department of ECE Bradley Fellowship Award, Spring 2015
- Engineering Education Teach Talks Scholarship, Spring 2013
- Electrical Engineering Department Fellowship Award, Spring 2011
- ETA KAPPA NU (HKN) Electrical and Computer Engineering Honor Society, February 2010
- Student Member, IEEE, January 2007 - Present
- Presidential Undergraduate Research Award, UROP, August 2008
- PURA Travel Award, UROP, March 2008/February 2009
- Poster Presentation at Annual TMS Conference, March 2008/February 2009
- Intel Diversity Summit 2008, Intel Foundation, August 2008
- Intel 2008 REU Fellow, Intel Foundation, May 2008

SKILLS

- Class 100/1000 Cleanroom Experience, *Georgia Tech MRC* | *Cornell NanoScale Facility* | *Virginia Tech MicrON Cleanroom*
- Semiconductor Device Processing Experience, *GaN* | *GaAs* | *InN* | *Si*
- Programming and Modeling Knowledge, *Crosslight* | *L-Edit* | *Silvaco SSuprem3* | *C* | *LabVIEW* | *MATLAB* | *VHDL* | *Assembly*