Ankit Shukla

3261, Holonyak Micro and Nanotechnology Laboratory, 208 N Wright St, Urbana, IL 61801
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EDUCATION

University of Illinois at Urbana-Champaign (UIUC) Aug. 2019 - Present
PhD. Student, Electrical and Computer Engineering
Advisor: Prof. Shaloo Rakheja

New York University (NYU), Brooklyn Aug. 2018 - Aug. 2019
PhD. Student, Electrical and Computer Engineering
Advisor: Prof. Shaloo Rakheja

Indian Institute of Technology Madras (IITM) Aug. 2012 - May 2017
Dual Degree (B.Tech & M.Tech) in Electrical Engineering
Advisor: Prof. Anjan Chakravorty

RESEARCH INTERESTS

Theoretical and numerical magnetism, spintronics and solid state electronics

RESEARCH EXPERIENCE

Switching in a piezoelectric Antiferromagnets (AFMs) Apr. 2020 - Present
Towards PhD. Thesis *Collaborators: Arun Parthsarathy, Prof. Shaloo Rakheja*

· Studying the physics of ferroelectric materials for possible use in spin-torque driven AFM memory.

Antiferromagnetic textures and their dynamics Jan. 2020 - Present
Towards Ph.D. Thesis *Collaborators: Prof. Shaloo Rakheja*

· Working on numerical solution of coupled LLG equation for collinear and non-collinear AFMs
· The developed codes would then be used to study different textures and dynamics in AFMs.

Switching time of spin-torque-driven magnetization in biaxial ferromagnets Jan. 2019 - Jan. 2020
Towards PhD. Thesis *Collaborators: Arun Parthasarathy, Prof. Shaloo Rakheja*

· Extended analytic switching models for spin-torque driven in-plane magnetic memories using constant-energy orbit approximation
· Derived analytic models for probability distribution functions and benchmarked them against numerical data for single-domain magnets.

Numerical modeling of electron transport in Silicon Nanowire transistor-2 Jul. 2017 - Jun. 2018
Research Assistant *Advisor: Prof. Anjan Chakravorty*

· Implemented electron-phonon interaction based scattering dominated transport using first order Born approximation
· Implemented hydrodynamic transport model in mode-space to consider the effects of thermal diffusion.

Numerical modeling of electron transport in Silicon Nanowire transistor-1 Jun. 2016 - May 2017
Masters Dissertation *Advisor: Prof. Anjan Chakravorty*

· Implemented electron transport in a Silicon Nanowire transistor by solving Poisson's, Schrodinger's and transport equations (NEGF and BTE) for both ballistic and diffusive transport limits
· Also implemented and studied the effects of self-heating on electron transport using Fourier's law.

MEETINGS/TALKS

A. Shukla, A. Parthasarathy, and S. Rakheja, "Analytic modeling of switching time dynamics of monodomain ferromagnets with biaxial energy landscape", accepted at APS March Meetings 2020.

JOURNAL PUBLICATIONS

A. Shukla, A. Parthasarathy, and S. Rakheja, "Switching time of spin-torque-driven magnetization in biaxial ferromagnets". (Under review)

SCHOLASTIC ACHIEVEMENTS

- Recipient of the **School of Engineering Fellowship** at NYU for 2018-2019
- Secured an **All India Rank 749** in IIT-JEE 2012 among half million applicants

PROFESSIONAL EXPERIENCE

Graduate Research Assistant Aug. 2018 - Present
Dept. of Electrical and Computer Engineering, NYU/UIUC

- Studying the effects of spin torque on ferromagnets and antiferromagnets with different energy landscape using numerical and analytical approaches under the guidance of Prof. Rakheja.

Teaching Assistant Jul. 2016 - May 2017
Dept. of Electrical Engineering, IIT Madras

- Assisted the instructors with grading and preparing homework solutions for the courses EE2016: Microprocessor Theory & Lab and EE3005: Communication Systems.

Summer Intern May 2015 - July 2015
General Electric, Bangalore

- Worked on the development of a simulator in a team of experienced professionals with an aim to optimize company's resources
- Contributed towards establishing serial port communication between different modules of the software replica of the hardware simulator using C and C++.

RELEVANT COURSES

UIUC: Theory of Semiconductors and Semiconductor Devices, Integrated Optics and Optoelectronics.

NYU: Introduction to VLSI Design, Nanoelectronic Devices, Hardware Security, Scientific Computing.

IITM: Solid State Devices, Device Modeling, MOS Device Modeling and Characterization, VLSI Technology, Advanced CMOS Devices and Technology.

SOCIAL SERVICE

National Service Scheme Aug. 2012 - May 2014

- Read English literature to visually impaired college students in order to help them in their academics.

Avanti Fellows Aug. 2014 - Jul. 2016

- Mentored two high school students in their preparation for IIT Joint Entrance Exam
- Taught a few classes of high school physics and helped the students with problem solving .