Md Tanvirul Islam

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RESEARCH INTERESTS

Human-computer Interaction, Machine Learning, Artificial Intelligence, Big Data, Computer Vision, Software Systems

EDUCATION

University of Connecticut, Storrs, CT
Bachelor of Science in Engineering, May 2019
Double Major: Computer Science and Engineering, Electrical Engineering
GPA: 3.64 / 4.00

Related Courses: Algorithms, Data Structures, Systems Programming, C++ Essentials, Principles of Databases, Big Data, Operating Systems, Compilers, Computer Architectures, Probability, Theory of Computations, Digital Systems Design, Microprocessors

TECHNICAL SKILLS

Languages	C/C++, Java, Python, SQL, Bash, MIPS, LaTeX.
Web Development	HTML, CSS, Bootstrap, JavaScript, jQuery, WordPress
Software	MATLAB, GNURadio, LabVIEW, PSPICE, LogicWorks, Git, Visual Studio, Eclipse, Emacs, Vim, gdb, Valgrind
Hardware Programmming	Arduino, AVR, VHDL
Operating Systems	Unix/Linux, Windows, Mac OSX

RESEARCH EXPERIENCE

National Science Foundation Research Experience for Undergrads   Storrs, CT
Summer Researcher, University of Connecticut   **May 2018 - August 2018**

Worked under the supervision of Dr. Song Han and Dr. Shengli Zhou on using software defined radio to implement real-time wireless communication systems. During my research, I explored GNURadio software framework for software defined radio platform and developed an ad hoc wireless system capable of inter-computer message transfer. Used C++ (Boost/SWIG) and Python to code the signal processing blocks in GNURadio. Custom MAC protocol was written on top of the PHY layer to handle data transmissions. Experimented with IEEE 802.15.4 ZigBee implementation in GNURadio for real-time data transfer. To optimize latency, O-QPSK PHY and custom MAC layer protocols were implemented in the network with a Packet Loss Ratio (PLR) of 8%.

University of Connecticut, Department of ECE   Storrs, CT
Undergraduate Research Assistant   **September 2016 - August 2018**

Collaborated with Dr. John Ayers on researching buffer layers for metamorphic semiconductor devices. In my work, I simulated and analyzed novel growth platforms for InGaAs/GaAs semiconductor devices. I implemented algorithms on MATLAB to simulate chirped and unchirped superlattice structures, and quantify their performance using theories from Numerical Energy Minimizatin Model, Electric Circuit Model for Strained Layer Epitaxy, and Matthews, Mader, and Light approach. We simulated the average and surface strain, the

surface in-plane lattice constant, and threading dislocation density profiles for the superlattice structures. From the study, we showed that chirped superlattices can serve as growth-platform with a 7%-46% Indium composition. From the dislocation density profiles, we concluded that thickness-modulated chirped superlattice can outperform unchirped superlattices and linearly-graded layers as dislocation filters.

PUBLICATION

Islam M., Chen, X., Khujofsa, T., J. Ayers, "Chirped Superlattices as Adjustable Strain Platform for Metamorphic Semiconductor Devices". IJHSES CMOC 2017

RESEARCH POSTERS

- **Islam M.**, Chen, X., Cai M., Khujofsa, T., Ayers, J., "Comparison of Chirped and Unchirped Superlattices as Dislocation Filters for Metamorphic InGaAs/GaAs (001) Devices". Poster presented at the Materials Science and Technology Conference, Ohio, October 2018
- **Islam M.**, Chen, X., Khujofsa, T., Ayers, J., "Threading Dislocations in Metamorphic Semiconductor Buffer Layers Containing Chirped Superlattices". Poster presented at the Connecticut Micro and Optoelectronics Conference 2018, New Haven, CT
- Cai M., Khujofsa, T., Chen, X., **Islam M.**., Ayers, J., "Interaction Length for Disclocations in Compositionally Graded and Multilayered Semiconductor Heterostructures". Poster Presented at the Connecticut Micro and Optoelectronics Conference 2018, New Haven, CT
- Khujofsa, T., Cai M., Chen, X., **Islam M.**, Ayers, J., "Optimization of Graded Buffer Layers for Metamorphic Semiconductor Devices". Poster Session Presented at the Connecticut Micro and Optoelectronics Conference 2018, New Haven, CT
- Chen, X., **Islam M.**, Khujofsa, T., Ayers, J., "Comparison of Chirped and Unchirped Superlattices as Buffer Layers for Metamorphic InGaAs/GaAs (001) Devices". Poster presented at the MIT IEEE Undergraduate Research and Technology Conference 2017, Cambridge, MA
- Chen, X., **Islam M.**, Khujofsa, T., Ayers, J., "Comparison of Chirped Superlattices and Linearly-Grrded Buffer Layers as Adjustable-Strain Platforms for Metamorphic InGaAs/GaAs (001) Devices". Poster presented at the 232rd Electrochemical Society Meeting 2017, National Harbour, MD
- **Islam M.**, Chen, X., Khujofsa, T., Ayers, J., "Chirped Superlattices as Adjustable Strain Platforms for Metamorphic Semiconductor Devices". Poster presented at the Connecticut Micro and Optoelectronics Conference 2017, Storrs, CT

WORK EXPERIENCE

University of Connecticut - Fine Arts Dean's Office   Storrs, CT
Technical Support Specialist   **September 2017 - Present**
- Develop and maintain the front-end of the websites for UConn School of Fine Arts and Benton Museum with HTML, CSS (Bootstrap), JavaScript, jQuery, and WordPress
- Administer the sever for museum's record database using EmbARK CMS, PowerShell
- Provide IT support to classrooms and exhibitions to ensure a reliable technical platform

The Travelers Companies   Hartford, CT
IT Intern, Voice and Multimedia Technologies   **June 2017 - August 2017**
- Collaborated to implement RedSky E911 service that sends precise location on a 911 call
- Wrote VBA to automate monthly call-data aggregation process that boosted productivity

The Travelers Companies   Hartford, CT
IT Intern, PI Application Development   **June 2016 - August 2016**

- Coordinated with the developers of PI department and designed a web-repository with Confluence Wiki that stored the metadata of all web services used within PI
- Programmed data-driven tests on web services using Groovy Script with SoapUI

Sylvan Learning Center   West Hartford, CT
Tutor   **May 2015 - November 2015**

- Held lecture sessions to prepare students for SAT Mathematics
- Tutored high-school juniors and seniors on Mathematics (Algebra, Geometry, Trigonometry), Physics, and Chemistry and answered any related questions on the topics

Quantitative Learning Center at University of Connecticut   West Hartford, CT
Student Tutor   **February 2015 - May 2015**

- Tutored students in classes such as Introduction to Programming with MATLAB, Calculus I/II, Physics for Engineers, and General Chemistry
- Lectured groups of students on programming concepts such as function, data structures, recursion, and good code-writing practices

PERSONAL
PROJECTS

Checkers AI
- Created a game of checkers with a functioning AI as the opponent using C++ 14

Visualization of Cellular Automata
- Designed an interactive web-app with JavaScript and jQuery to simulate cellular automata

Object Classifier with TensorFlow
- Used the TensorFlow 1.5 library to work on an Image Classifier that trains on a given set of images and can classify playing cards

Pong!
- Developed a GUI Pong application having real-time ball physics and bar movements using the C++ SDL2 Library

HONORS &
AWARDS

- **Honors Soceity** for Electrical and Computer Engineers (UConn HKN)   2016 - Present
- **Best undergraduate research poster** at the CMOC Conference   2017
- **University of Connecticut Engineering Scholarship** recipient   2016
- **Governor's Academic Incentive Award** for academic excellence   2015
- **Dean's List** for outstanding grades   Fall '14, Spring '15, Fall '15, Spring '18