Nazmul Haque Turja

https://nh-turja.github.io/

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Education

- **New Mexico State University** — Las Cruces, NM
  Master of Science (MSc.) in Electrical and Computer Engineering (ECE) — *Aug 2021 – Current*
  CGPA: ***4.00/4.00***; Major: Computer Engineering
- **Bangladesh University of Engineering and Technology (BUET)** — Dhaka, Bangladesh
  Bachelor of Science (BSc.) in Electrical and Electronic Engineering (EEE) — *Jul 2014 – Oct 2018*
  Major: Communication Engineering

Experience

- **Department of ECE, New Mexico State University** — Las Cruces, NM
  Graduate Research and Teaching Assistant — *Aug 2021 - Current*
  - **Basic Block Count with ML techniques**: Utilizing the nvbit supported PPT-GPU (Performance prediction toolkit for GPU), predicted the BB counts of different Polybench, Rodinia, Pannotia benchmarks and Lulesh application by using ML techniques. (Paper Under Review)
  - **PPT-GPU**: Working in collaboration with **Los Alamos National Lab** for developing reuse distance and memory tracing toolkits for PPT-GPU. **GitHub:** https://github.com/lanl/PPT
  - **LDMS/OVIS-HPC**: Working in collaboration with **Sandia National Lab** for developing LDMS GPU Sampler toolkit for OVIS-hpc (a modular system for HPC data collection). **GitHub:** https://github.com/ovis-hpc/ovis
  - **Course Instructor**: Managed 50+ students on concepts of Electronics, Digital Circuit Design and VHDL and also mentored them in weekly assignments and projects with lively discussions and exchange of ideas to enhance learning.
- **Department of CSE, BRAC University** — Dhaka, Bangladesh
  Adjunct Faculty — *Feb 2021 - Sept 2021*
  - **Achievement**: Conducted theory and lab classes for VLSI Design (CSE 460), and Digital Electronics and Pulse Techniques (CSE 350). These labs involve Proteus, Quartus II, Microwind and ModelSim.
  - **IoT Applications**: Involved in several applications of Internet of Things(IoT) for health-care and agriculture for the People's Republic of Bangladesh under the supervision of Dr. Farhad Hossain, Professor, department of EEE, BUET. **GitHub:** https://github.com/nh-turja/internet-of-things
  - **UGC Grant**: Received a grant of 3,00,000/=(BDT) from University Grants Commission(UGC), Bangladesh for developing and testing IoT based railway track fishplate monitoring system.
- **Nelsite Inc. Ltd.** — Fukuoka, Japan
  Semiconductor Engineer — *Nov 2019 - April 2020*
  - **Embedded Systems**: Worked on 32 bit ARM Cortex-M4 microcontroller using keil compiler and embedded C language.
  - **Semiconductor Industrial Training**: Received on-job training on basic fabrication, material characterization and the current technological trends of the semiconductor industries of Japan.

Selected Coursework

- **Computer Engineering**: Advanced Computer Architecture, Application of Parallel Programming, Compiler Transition, Computer Architecture, VLSI, Microprocessor and Interfacing, Analog and Digital Electronics.
- **Artificial Intelligence**: Application of Machine Learning, Deep Learning, Random Signal Analysis, Linear Algebra, Probability and Statistics.

Programming Skills

- **Languages**: CUDA, OpenCL, Python, Embedded C/C++, VHDL, System Verilog, Golang, Lex, Yacc, LaTex
- **Software and Tools**: Numpy, Pandas, Tensorflow, Keras, Scikit-learn, Linux, Eagle, Proteus, Quartus II, Cadence, OpenCV

Bachelor's Thesis

- **A Secured Offline Online Approach for Internet of Things(IoT) Using Real-time Database**: My thesis presents several IoT applications along with a new cyber-secured MQTT based offline system that can automate various systems integrated into a single dashboard where monitoring and controlling can be simultaneously executed. **Thesis Book Link:** https://tinyurl.com/y2n2qenu

Projects

- **Cache Memory Simulator**: Using C++ wrote various programs for Cache Memory Simulator which can be used for simulating different types of caches (direct mapped, set associative etc.) **GitHub:** https://github.com/nh-turja/cache-simulator
- **MIPS**: Created an MIPS by using Abstract Syntax Tree (AST) for the course of Compiler Transition.
- **8-bit Simple As Possible(SAP) Computer**: Designed a 8-bit microcomputer with 64kBytes of main memory(RAM) support and simulated it in Proteus software. **GitHub:** https://github.com/nh-turja/simple-as-possible-computer
- **Autonomous RC Car**: Made OpenCV and neural network based miniature autonomous RC car which can detect different signs on the road and drive accordingly. **GitHub:** https://github.com/nh-turja/autonomous-RC-car
- **4-bit Shift Register**: Designed a general purpose 4-bit shift register which is capable of left shift, right shift and parallel loading.
- **Wearable device for Alzheimer's Patient**: Made a wearable device for Alzheimer's patients for path finding in a house. **GitHub:** https://tinyurl.com/y4mza8h9
- **IoT Home Automation**: Build a IoT based home automation system using real-time database, web interface and also made an android app which can control and monitor that automated system. Project Demo
- **IoT Waste Management**: Built a IoT based waste management system which can perform current garbage level detection in real-time and alert the garbage collector when necessary. Project Demo

Publications

- **Conference Paper**: A Conference Paper published in IEEE WISPNET 2019 held in Chennai, India titled *A Cyber-Secured MQTT based Offline Automation System.*

Awards

- **Battle of Hardware (IoT)**: Champion at Battle of Hardware (IoT) in "CSE Festival 2018" organized by Department of CSE, BUET.
- **CISCO Hackathon, BD**: Honorable mention at the Hackathon of the Internet of Things (IoT) organized by CISCO, Bangladesh in 2018.

Professional Training

- **IC Layout and Physical Design**: Implemented standard cell in custom design and made analog layout and circuit design of PLL, oscillator and switching regulator.
- **Front End Verification**: Developed analog models for schematics in verilog-AMS and done front-end verification of different ASIC designs.