Nazmul Haque Turja

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Education

- **Bangladesh University of Engineering and Technology (BUET)** — Dhaka, Bangladesh
  Bachelor of Science in Electrical and Electronic Engineering (EEE) — *July 2014 – April 2019*

Experience

- **Department of CSE, BRAC University** — Dhaka, Bangladesh
  Adjunct Faculty — *Mar 2020 - Current*
  - **Achievement**: Conducting 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.
- **Bangladesh University of Engineering and Technology** — Dhaka, Bangladesh
  Research and Development Assistant — *Jan 2020 - Dec 2020*
  - **Parallel Computing**: Worked on a publicly available and comprehensive multi-GPU simulation framework and wrote benchmark to evaluate next-generation multi-GPU system designs. Paper under review.
  - **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.
  - **Power over Ethernet(PoE) PCB board**: Designed, built and tested a prototype of power over ethernet (PoE) PCB board using Eagle CAD software.

Selected Coursework

- **Data Science**: Machine Learning, Deep Learning, Artificial Intelligence, Optimization for Machine Learning, Linear Statistical Model, Stochastic Decision Models, Random Signal Processing, Introduction to Stochastic Processes, Probability and Statistics.
- **Semiconductor and Embedded System**: VLSI I/II, Micro controller, Compound Semiconductor and Hetero-junction Devices, Semiconductor Device Theory, Processing and Fabrication Technology, Computer Architecture, Microprocessor and Interfacing, Analog Integrated Circuits, Digital Electronics.

Programming Skills

- **Languages**: CUDA, OpenCL, Assembly, Embedded C, AVR, C++, Java, Visual Basic, Python, Verilog, VHDL, System Verilog, Matlab, R, Golang, PHP, Javascript, LaTex
- **Software and Tools**: Keil Compiler, Linux, Atmel Studio, Eagle, Proteus, Quartus II, Cadence, Lumerical, OpenCV, Raspbian, Tensorflow, Keras, Scikit-learn, PSpice, Eclipse, Comsol, Android Studio, Innovus, Assura, Calibre

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

- **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.
- **Number and Speech Recognition**: Using DSP techniques and MATLAB interface wrote various programs which can recognize the handwritten bengali digits and perform the speech recognition as well.
- **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
- **Counting Machine**: Using image processing techniques built a people's counting machine for a supershop.
- **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
- **Hand gesture recognition**: Using an accelerometer, built a hand gesture recognition device for elderly patients who can use this device only with their fingers.
- **Color detection and Length Measurement**: Using digital logic devices build a prototype for color detection and length measurement.
- **Fault Current Analysis**: Determined the fault current of 6 bus system for LLL and LG faults and breaker ratings.
- **PFI Plant**: Designed a Power Factor Improvement (PFI) plant using microcontroller and matlab.

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 Chip Processing and Fabrication**: Received training based on current technological trends of the semiconductor industries in Japan and IC chip processing methodology.
- **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.