

# M Rifat Hossain

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## Objective

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A graduate fresher with the experience of being an undergraduate research assistant for a year – aiming to become a good researcher and a better academician. I have experience working with high-level to low-level programming languages, designing/simulating optoelectronic devices, logic/circuit design of ICs using Verilog, and executing the design practically on FPGA, which I plan to implement to good use.

## Research Interests

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- ✓ Optoelectronic Devices
- ✓ FPGA
- ✓ VLSI

## Education

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**Shahjalal University of Science and Technology, Sylhet,**  
B.Sc. in Electrical and Electronic Engineering

Jan 2019 – Apr 2024

- GPA: 3.52/4.0
- **Focus:** Optoelectronics

## Publications

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- **M. R. Hossain**, M. A. A. Chowdhury, and M. S. Hossain, "Digital data encryption and decryption following the Enigma Machine technology and designing of a Cipher IC" in International Conference on Electrical and Computer Engineering (ICECE 2024) (Submitted Conference Paper)
- R. Zakaria, A. Mahmood, **M. R. Hossain**, et. al., "Design and Implementation of a Light-duty Electric Vehicle Incorporated with Wireless Charging System" (Ongoing Journal Article)

## Research Work

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- Design and Simulation of PIN Double Heterostructure GeSnC LED (Undergraduate Thesis)
  - Simulating LED with new material GeSnC and determining its usage
  - Completion date: Mar 2024
- Design and Implementation of a Light-duty Electric Vehicle Incorporated with Wireless Charging System
  - Wireless Power Transfer using induction technology
  - Building a basic light-duty EV
  - Completion date: Nov 2023
- Wireless Communication System over N-Byte AES Encrypted Channel
  - Audio encoding and decoding
  - Encryption-Transfer-Decryption systems
  - Completion date: Jan 2023
- Enigma Encrypted Wireless Communication Device (ongoing)
- Atmospheric Oxygen Meter determining the oxygen level from the amount of infrared (580-1270 nm) light absorption (ongoing)

## Projects

- EESMS: Enigma Encrypted SMS & Group Chat (ongoing)
- PSystem Library: A C++ library for determining power system properties (i.e., Z-bus, Y-bus, Load flow)
- Guitar Tuner using Arduino
- hugeMath.JS: A calculator in which any datatype's value range does not bound operations.
- A game company website development
- Patient DBMS for Ayesha Homeo Clinic

## Experience

**Undergraduate Research Assistant,**  
Shahjalal University of Science and Technology, Sylhet

Aug 2022 – Nov 2023

- Project Completion: Design and Implementation of a Light-duty Electric Vehicle Incorporated with Wireless Charging System
- Reaching to media personnel
- Confronting TV interview

**Industrial Trainee,** Training Institute for Chemical Industries (TICI), Narshingdi

Sep 2023

- Hands-on experience with industrial equipment
- Gaining skills in Instrumentation and Control Engineering

## Technical Skills

|   |  |
|---|--|
| <b>COMSOL Simulation</b><br>Having experience in creating photodiode, phototransistor, and LED using custom-made semiconductor material (for example GeSnC); Building 1D, 2D, Axisymmetric, and 3D geometry on various complexity; Custom meshing that helps to reach an optimal state (on both the required time and quality) in simulation. | <b>Xilinx Vivado</b><br>Coding on an FPGA (i.e., designing a cipher IC that mimics the properties of the enigma machine) using Verilog and their performance analysis (size, power consumption, etc.). |
| <b>Circuit Simulation (LTSpice, Simulink)</b><br>Being used to simulate various analog circuitries.   | <b>Programming Languages</b><br>C++, Python, Java, Verilog, Assembly (8086), MATLAB, SQL, PHP  |
| <b>PCB Design (KICAD)</b><br>Able to design PCBs with preset components along with custom symbols and footprints.   | <b>Frameworks</b><br>Arduino, .NET, Bootstrap  |

## Standardized Test Scores

GRE – Quant: 166, Overall: 305

TOEFL – Appearing soon (Expected date: Oct 16, 2024)

## Language Proficiency

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|---------|--------|
| Bangla  | Native |
| English | Fluent |

## Awards/Achievements

- Certificate of Excellence: for holding the esteemed position of General Secretary, EEE Society, SUST - 2023
- Secured CGPA 4.00 (A+) in industrial training at Training Institute for Chemical Industries (TICI), Narshingdi - 2023
- Certificate of Excellence: for holding the esteemed position of Vice Precedent, Shahjalal University Speakers Club (SUSC) - 2023
- Silver Medalist in National Olympiad in Software Innovation (NOSI) - 2014