

# Tanvir Alam Shifat

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## EDUCATION

### Oregon State University

*Ph.D. in Electrical and Computer Engineering (Major)*

*Ph.D. in Artificial Intelligence (Minor)*

Research Area: Control Systems, Electric Vehicles, Artificial Intelligence.

Corvallis, OR, USA

*June 2021 - Present*

### Kumoh National Institute of Technology

*MS in Mechanical and Electrical Convergence Engineering*

Thesis: Machine Learning Based Prognostics and Health Management of BLDC Motors.

Gumi, South Korea

*Sep 2018 - Aug 2020*

### East West University

*BS in Electrical and Electronic Engineering*

Thesis: An Investigation of the Performance of Low Doped 100-nm Thick P-type Polysilicon Nanowire.

Dhaka, Bangladesh

*Jan 2012 - Apr 2016*

## SKILLS

**Programming:** Python, MATLAB/Simulink, R, LabVIEW.

**AI Libraries:** Scikit-learn, TensorFlow, Keras, PyTorch, OpenCV, SciPy, NumPy, Pandas.

**Modeling Tools:** PLECS, LTspice, Simscape, MATPOWER, WEC-Sim, AutoCAD.

**Hardware:** DAQ setup, Sensor calibration, Wiring harness, Signal routing, System-level diagnostics, Relay/fuse.

**Soft Skills:** Mentorship, collaboration with cross-functional teams, adaptability in dynamic environments, technical writing, presenting for diverse audiences, detail-oriented and execution focused .

## WORK EXPERIENCE

### Intern, Electrical Engineer

*Sylvan Systems*

June 2025 – Sep 2025

*Eugene, OR, USA*

- Created detailed wiring diagrams for EV conversion of a gasoline pickup using Tesla Model 3 large drive unit.
- Assembled 12V wiring harnesses and integrated HV power circuits for traction and auxiliary systems, including LDU-to-drive control, inverter and BMS interfaces, IVT-S shunt, J1772 charger, RND switch, safety interlocks.
- Replaced engine-dependent hydraulic brake system with an electric vacuum pump to enable electric brake assist.
- Bench-tested powertrain and implemented fuse protection architecture using both in-vehicle and external fuse boxes; added relays for circuit control and protection across drive and auxiliary subsystems.

## RESEARCH PROJECTS

### Sim-2-real DRL Controller design for Fuel Cell EV with terrain preview

Apr 2025 — Now

- Established a reinforcement learning-based control framework to minimize  $H_2$  consumption while obeying system constraints like battery SOC level for different driving scenarios.

### PI-emulating MPC and Neural Networks for wave energy converters (WECs)

June 2022 – Apr 2025

- Developed and verified a constrained pseudo-PI control for WECs using MPC, achieving a tracking error  $< 1\%$  and improved MPC DC gain close to that of a PID controller through a linear matrix inequality (LMI) approach.

### Linear Power Take-Off system design for class-8 e-truck suspension system

Jan 2023 – Jun 2024

- Built a hardware prototype and formulated a mathematical model of the relative movement between the chassis and cab of a Class 8 commercial truck, demonstrating a maximum power extraction potential of 8 kW.

### AI-based fault diagnosis and RUL prediction of BLDC motors

Sep 2018 – May 2021

- Built a test-rig and NI LabVIEW DAQ environment for conducting accelerated life test experiments and acquiring multi-sensor signals e.g., motor speed, vibration, stator current, output voltage, coil temperature, etc.

## RELEVANT GRADUATE COURSES

Hybrid Electric Vehicles, Contemporary Energy Analysis, Power Electronics (MIT OCW), Adv. Power Electronics, Linear Systems, Power System Analysis, Power System Protection, Semiconductors, Machine Learning, Deep Learning, Intelligent Agents and Decision Making.