Md Tanzid Hossain

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EDUCATION

Ph.D. in Mechanical Engineering, Colorado School of Mines, Golden, CO **Aug 2023 – Present**

MS in Mechanical Engineering, University of Maine, Orono, ME **Aug 2020 – May 2023**

- **Degree Concentration:** Robotics and Mechatronics
- **GPA:** 3.89/4.00
- **Coursework:** Machine Learning, Robot Dynamics and Control, Modern Control Theory and Application, Mobile Robotics, Adv. Heat Transfer, Intro to Statistics, Engineering Optimization, Adv. Strength of Materials, Intro to Continuum Mechanics.

BS in Mechanical Engineering, Bangladesh University of Engineering & Technology (BUET) **Feb 2015 – April 2019**

- **GPA:** 3.45/4.00
- **Major Coursework:** Mechanical Engineering Drawing, Engineering Mechanics, Mechanics of Solids, IC Engines, Fluid Mechanics, Heat Transfer, Thermo Fluid System Design, Renewable Energy, Refrigeration and Building Mechanical Systems, Machine Design, Power Plant Engineering, Fundamentals of Electrical Engineering, etc.
- **Thesis title:** *"Study on electro-mechanical and corrosion behavior of Copper-based alloys."*

RELATED ACADEMIC EXPERIENCE

Department Of Mechanical Engineering, Colorado School of Mines, Golden, CO

Graduate Teaching Assistant **Aug 2023 – Present**

- **Course:** Introduction to Robotics.
- Coordinate and organize the Robotics labs for 30 students.
- Assist students with problem-solving and grade assignments.

Department Of Mechanical Engineering, University Of Maine, Orono, Maine

Graduate Teaching Assistant **Aug 2022 – May 2023**

- **Courses:** Modern Control Theory and Applications, Applied Mechanics: Statics.
- Coordinate and organize the digital classroom for online classes.
- Assist students with problem-solving and grade assignments.

Graduate Research Assistant **Jan 2021 – May 2023**

- Development of a robot-assisted haptic feedback gait system that investigates the neurological link between the upper and lower limbs and aids in generating coordinated arm and leg motions during walking in elderly people.
- Developed a **portable haptic feedback** system to improve the walking performance of older adults.
- Developed an **Android application** that can receive data via Bluetooth from an Xsens motion sensor system and provide HTTP requests to the haptic module according to the older adults' walking performance.
- Developed a **machine-learning algorithm** to detect a person's walking and stopping phases.
- Recruited and worked with human subjects for engineering research in accordance with the **Institutional Review Board (IRB)** of the University of Maine.
- Completed a standard course titled **"Social & Behavioral Research"** offered by **"The Collaborative Institutional Training Initiative (CITI)"**.
- Authored two **research articles** currently under review for publication in **"Human Movement Science"** and **"IEEE Transactions on Neural Systems and Rehabilitation Engineering"** journals.

PUBLICATION

- **Hossain, M. T.**, Noghani, M. A., Sidaway, B., & Hejrati, B. (2023). Investigating the efficacy of a tactile feedback system to increase the gait speed of older adults. *Human Movement Science*, *90*, 103103.
- Noghani, M. A., **Hossain, M. T.**, & Hejrati, B. (2023). Modulation of arm swing frequency and gait using rhythmic tactile feedback. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, *31*, 1542-1553.
- Poster presentation titled "A Novel Haptic Feedback System for Gait Training" at the **"2022 Retreat"** conference, Beverly, MA organized by **American Physical Therapy Association (APTA)**.
- Reviewed a paper in preparation for the International Conference on Intelligent Robots and Systems **(IROS 2022)**.

COURSE PROJECTS

Graduate Course Projects, University of Maine:

- **Implementation of camera calibration with the help of ROS using two mutually orthogonal checkerboards**
  Used open-source computer vision (OpenCV), ROS, and C++ to detect corners of the checkerboards.
- **Application of optimization theory to determine the optimal angle of thigh extension for enhancing gait speed**
  Used the graphical solution method to find the optimum thigh angle for improving walking speed.

Undergraduate Course Projects, Bangladesh University of Engineering & Technology:

- **Design and fabrication of a Double Tube Heat Exchanger (DTHX)**
  Used "Xchanger Suite" software from Heat Transfer Research, Inc. to satisfy the DTHX's design requirements.
- **Design and fabrication of an automatic dishwasher**
  Used Solidworks to design the dishwasher and implemented an Arduino microcontroller to control the motor, pump, and other sensors.

SKILLS

- **Programming Language and Modeling Software:** MATLAB, R, Python, C, C++, Java.
- **Design Tools:** AutoCAD, SolidWorks, Fusion 360.
- **Sensors and Motion Capture Tool:** Xsens Dot, Xsens MVN, Delsys EMG, Vicon Nexus Camera System, Visual 3D.
- **Robotics and Mechatronics**: Robot Operating System (ROS), KiCad EDA (Printed Circuit Board designing tool) .
- **Heat Equipment Design Related Tools:** 3E Plus, HTRI.

RELATED INDUSTRY EXPERIENCE

Executive (Engineering Dept.) – SQUARE Textile Division, Sardagonj, Bangladesh **Feb 2020 – May 2020**

- Conducted risk assessment of machines, supervised checking the fire systems, fire alarm, fire pump, diesel pump, and taught fire-fighting course and fire-fighting equipment.
- Monitored the regular check-up of the chiller and cooling tower.

Industrial Trainee – People's Ceramics Industry, Tongi, Bangladesh **Sept 2018 – Oct 2018**

- Gained Hands-on experience in different units and operations of technical divisions like Boiler, Air Compressor and Generator, HVAC systems, and Cooling systems.

ORGANIZATION & CO-CURRICULAR ACTIVITIES

- Member of the American Society of Mechanical Engineers **(ASME)** **Oct 2022 – Present**
- Member of Soccer team, UMaine Intramural sports **2021**
- Association Representative of Mechanical Engineering Association, BUET **Feb 2015 – April 2019**
- Member of BUET Entrepreneurship Development Club and BUET Career club **Aug 2015 – April 2019**
- **Linguistic Proficiency:** English, Bangla, Hindi, Urdu