Shovan Chowdhury

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Shovan-Chowdhury
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EDUCATION

Ph.D. in Data Science and Engineering — Knoxville, Tennessee
The University of Tennessee, Advisor: Dr. Joshua New — August 2022–Current

- Bredesen Center Fellow
- Courses: Introduction to Data Science, Machine Learning

Master of Science in Mechanical Engineering — Pocatello, Idaho
Idaho State University, GPA: 3.84/4.00 — January 2019–August 2022

- Thesis: "Artificial Intelligence Based Battery Diagnostic Platform", Advisor: Dr.Leslie Kerby
- Courses: Data Mine and Predict Analytics, Applied Neural Network, Applied Regression Analysis, Database Design and Implementation

Bachelor of Science in Mechanical Engineering — Chittagong, Bangladesh
Chittagong University of Engineering & Technology — March 2011–September 2015

- Thesis: "Electronic Waste Management in Chittagong", Advisor: Dr. Sajal Chandra Banik
- Courses: Probability and Statistics, Numerical Techniques, Data Structures and Algorithms

EXPERIENCE

Oak Ridge National Laboratory — Oak Ridge, Tennessee
Graduate Research Assistant (Supervisor: Joshua New) — April 2023- Continuing

- Developed Utility-scale and larger building energy model
- Analyzed Building energy modeling such as energy conservation measures, demand management, climate projections, etc.
- Developed future typical meteorological year weather files for every US County
- Worked on bias correction for Urban Building Energy Modeling
- Measured the climate impact of large-scale building energy model

Idaho National Laboratory — Idaho Falls, Idaho
Data Analytics Intern (Supervisor: Ryan Stewart) — May 2022- August 2022

- Worked on automation of very high temperature thermal reactor's tuning process utilizing artificial intelligence.
- Utilized Recurrent Neural Network(RNN) and Long-Short Term Memory (LSTM) for solving sequence to sequence time series problem.
- Examined various AI/ML codes and tested to determine their capabilities and applicability to the problem at hand.

Center For Advanced Energy Studies — Idaho Falls, Idaho
Data Science Intern (Supervisor: Boryann Liaw) — May 2021-August 2021

- Developed a python based object oriented application for analyzing battery data.
- Manipulated data science and machine learning tools like pandas, NumPy, Scipy, matplotlib, seaborn, Scikit-learn etc. for building this application.
- Implemented Linear transformation, numerical techniques and other statistical methods.
- Executed electro-chemical analysis and diagnosis of Li-ion Battery

Computational Engineering and Data Science Lab, Idaho State University   Pocatello, Idaho
Graduate Research Assistant (Supervisor: Leslie Kerby)   June 2020 - April 2022
- Collaborated with Idaho National Lab to develop artificial intelligence based battery diagnostic platform
- Used various regression techniques (Random Forest, XGboost, Decision Tree, Support Vector, Linear, polynomial regression etc.) to predict cycle life of battery observing the early cycle discharge capacity.
- Carried out statistical analysis like data transformation, stepwise regression, ANOVA, multicolinearity etc.

Robotics Research Laboratory, Idaho State University   Pocatello, Idaho
Graduate Research Assistant (Supervisor: Marco Schoen, Alba Perez Gracia)   January 2019 - May 2020
- Developed an unity Hololens application using C# that can detect robot system with voice or IP address using robot web service.
- Identified the robotic systems in Augmented Reality (AR) environment using voice, displayed State of the robot and controller, configuration, running programs and 3D model in AR environment.
- Deployed speech recognition modules in the application which makes it easier to interact with robots using voice commands.

Department of Mechanical Engineering, Idaho State University   Pocatello, Idaho
Graduate Teaching Assistant   January 2019 - May 2020
- Course Taught: Kinematics and Dynamics of Machinery, Advanced Machine Design, ME Materials
- Evaluated student's homework, projects, labs, tests and other assessments and maintained records on student progress/grades
- Mentored students with assignments and held office hours to answer technical questions on homework and projects

Pacific Jeans Limited   Chittagong, Bangladesh
Assistant Manager (Engineering)   October 2015 - December 2018
- Supervised and Maintained Boiler, Air Compressor, Generator, Water treatment plant, Reverse Osmosis Plant.
- Brought Optimum Design to run cost effective production.
- Prepared cost analysis of steam, air, diesel, water consumption and other utility.

PUBLICATIONS

[1] A. Garg, S. Correa, F. Li, S. Chowdhury, J. New, K. Bacabac, C. Kunkel, and D. Baird, "Empirical validation of ubem: An assessment of bias in urban building energy modeling for chicago", Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States), Tech. Rep., 2024.

[2] S. Chowdhury, F. Li, A. Stubbings, and J. New, "Multi-model future typical meteorological (ftmy) weather files for nearly every us county", in *Proceedings of the 10th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation*, 2023, pp. 468–471.

[3] S. Chowdhury, F. Li, A. Stubbings, J. New, A. Garg, S. Correa, and K. Bacabac, "Bias correction in urban building energy modeling for chicago using machine learning", in *2023 Fourth International Conference on Intelligent Data Science Technologies and Applications (IDSTA)*, IEEE, 2023, pp. 91–98.

[4] S. Chowdhury, Y. Lin, B. Liaw, and L. Kerby, "Evaluation of tree based regression over multiple linear regression for non-normally distributed data in battery performance", in *2022 International Conference on Intelligent Data Science Technologies and Applications (IDSTA)*, 2022, pp. 17–25.

[5] S. Chowdhury and M. P. Schoen, "Research paper classification using supervised machine learning techniques", in *2020 Intermountain Engineering, Technology and Computing (IETC)*, IEEE, 2020, pp. 1–6.

[6] A. Nath, G. Das, A. Mallick, and S. Chowdhury, "Design, implementation and stabilization of a bipedal robot", in *AIP Conference Proceedings*, AIP Publishing LLC, vol. 1919, 2017, p. 020 023.

[7] G. Das, N. Anwar, S. Chowdhury, and P. P. Chakraborty, "An analytical report on renewable energy production from municipal wastes in bangladesh", *International Journal of Engineering Research*, vol. 5, no. 12, pp. 39–942, 2016.

[8] G. Das, N. Anwar, S. Chowdhury, and K. A. Rahman, "Design and fabrication of an image processing based autonomous weapon", *International Journal of Engineering Research, ISSN*, vol. 12, 2016.

PRESENTATION

- Chowdhury, Shovan, et al. "Evaluation of Tree Based Regression over Multiple Linear Regression for Non-normally Distributed Data in Battery Performance." 2022 International Conference on Intelligent Data Science Technologies and Applications (IDSTA). IEEE, 2022.
  San Antonio, Texas
- Chowdhury, Shovan, and Marco P. Schoen. "Research paper classification using supervised machine learning techniques." 2020 Intermountain Engineering, Technology and Computing (IETC). IEEE, 2020.
  Provo, Utah

SKILLS

- **Programming Language:** Python, C, C#, rapid, Matlab, SQL
- **Library:** NumPy, pandas, Scipy, scikit-learn, TensorFlow, Keras, NLTK
- **Modeling and Simulation:** SolidWorks, AutoCAD
- **Software & Tools:** AWS, Tableau, Git, Minitab, RobotStudio, Unity
- **DBMS:** MySQL, MariaDB, phpMyAdmin, Power BI

PROJECTS

See full list of projects on shovanchowdhury.com/projects

- **Research Paper Classification using Supervised Machine Learning Techniques**
  September 2019 - June 2020
  - Developed natural language processing techniques for classifying research paper using abstract and predicted result using linear and non-linear machine learning techniques and compared. Utilized natural language processing library (NLTK, spacy etc.) for pre-processing the text, executed count vectorizer and TF-IDF vectorizer for feature extraction.

- **Twitter Sentiment Classification using deep learning (CNN and LSTM)**
  January 2020 - April 2020
  - Developed word embedding (word2vec) model before train the model and demonstrated how this feature is important.

- **Speech Recognition Using Artificial Neural Network (ANN)**
  January 2019 - May 2019
  - Discovered the method of detecting speech by using previously trained voice sample of the speaker. Extracted various features of voice signal using digital signal processing in Matlab and trained using ANN.

- **Augmented Reality in Industrial Robot**
  January 2019 - May 2020
  - Identified the robotic systems in AR: Identification of the robotic system and precise localization using voice. Displayed system information services in AR: State of the robot and controller, configuration, running programs and 3D model are displayed in the AR environment. Able to run the robot through Hololens by using voice.

Scholarships and Awards

- Bredesen Fellowship at University of Tennessee   2022
- Best Poster Award at the Idaho State University   2022
- Champion at three minute thesis competition at the Idaho state University   2021
- Outstanding employee award for the contribution at Pacific Jeans Limited   2017
- Technical Board Scholarship for outstanding result at Chittagong University of Engineering & Technology 2015
- Higher Secondary Board Scholarship from Bangladeshi Government   2010

Service

- **President at Bangladesh Student Association at Idaho State University**   2021–2022
  Pocatello, Idaho
  - Managed and coordinated the affairs of the organization.
  - Presided at the meetings of the Executive Committee and the general meetings of the organization.
  - Organized various events and make communication with the community to be involved in this association.
  - Responsible to promote its activities and to fulfill its objectives with the cooperation of the other members of the Executive Committee.

- **Vice-President at Joyoddhoney (Cultural Organization)**   2014–2015
  Chittagong, Bangladesh
  - Managed and authorized all the cultural activities at a variety of cultural events with 120-150 guests each academic year.
  - Coordinated the selection process of student entertainment, ensuring high-quality acts and performances for each event.
  - Lead musical section of the organization and mentor other musician and singer.

- **Organizing Secratary at Andromeda Space & Robotic Research Organization)**   2014–2015
  Chittagong, Bangladesh
  - Arranged inter university Robo-fight competition where 37 university attended.
  - Organized and volunteered in several IEEE conference at Chittagong University of Engineering & Technology.
  - Exhibit several robotic seminar and workshop for students.

Training and Workshops

- Robot Programming 1 & 2 training in House of Design, Boise, ID   2019
- Training on Unity and Augmented Reality at Idaho State University   2019
- Training on factory management   2017
- 5S Visual Management by Intertek Bangladesh   2016
- Industrial training at Aftab Automobiles & Technology   2014