Dhruvin Dankhara

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EDUCATION

University of Guelph, Canada **Jan 2022 - May 2023**
Master of Applied Science in Engineering **GPA: 3.9 (92.7 %)**
Courses: Intro to Machine Learning, Software Architecture: AI, Intro to IoT, Finite Element Methods, Computer programming for MEng., Finance for Engineers

Gujarat Technological University, India **Jun 2015 - Jun 2018**
Bachelor of Mechanical Engineering **CGPA: 8.43/10**

Gujarat Technological University, India **Jun 2012 - Jun 2015**
Diploma in Mechanical Engineering **CGPA: 8.33/10**

SKILLS

- **Programming**: Python, Java, MATLAB, C++, Linux, Spark
- **Machine Learning**: TensorFlow, Keras, PyTorch, JAX, Scikit-Learn, OpenCV, RAY, MLFlow, DeepXDE
- **Data Analysis**: MySQL, Numpy, Pandas, Matplotlib, Seaborn, Power BI

ACADEMIC PROJECTS

Data Driven Reduced Order Model (Data Reduction) (Image Processing) **Nov 2022 - Mar 2023**

- Developed a Reduced-Order model using Dynamic Mode Decomposition for transient heat transfer in arbitrary domain
- Data extracted from infrared video captured by FLIR thermal imaging camera using OpenCV
- Reduced the captured data into 3 tiny matrices using Dynamic Mode Decomposition, that are able to interpolate data and extrapolate in the future

Physics Informed PINNs and DeepONet (Deep Learning) (Operator Learning) **Aug 2022 - Mar 2023**

- Developed and trained Physics Informed Neural Networks (PINN) and Deep Operator Network (DeepONet) to learn operator mapping between partial differential equations and their solution
- Implemented TensorFlow models with custom forward, backward and training methods
- Trained models are able to solve problems in solid mechanics, heat transfer and fluid dynamics using unseen data

3D printing non-adhesion anomaly detection (Machine Vision) (Deep Learning) **Dec 2022**

- Trained Convolution Neural Network using TensorFlow to detect 3D printing anomaly due to first layer non-adhesion
- Training data include total 1557 images of defected and non-defected samples. Model trained with 5 data augmentation layers and 2 convolution layers achieved 99% accuracy on validation set.

A review of NLP methods for Sentiment Analysis of Tweets (NLP) **Jan 2022 - May 2022**

- In depth review of Natural Language Processing techniques for Sentiment classification of sentiment-140 data set
- Implemented, dictionary based and bag of words representation based sentiment classifiers and compared performance

IoT for Equipment Health Management in Smart Factory: A Review **May 2022 - Sep 2022**

- Review of available Equipment Health Management (EHM) methods from the Internet of Things Perspective
- Study provides in-depth review of available sensors, communication techniques, data processing techniques, and deep learning methods for the purpose of EHM in industries

WORK EXPERIENCE

Research Assistant, University of Guelph, Canada **May 2022 - Present**

- Use of multidisciplinary skills in computer engineering, mechanical engineering, mathematics and machine learning to solve unique problems in engineering
- Development of data driven algorithms and machine learning models for engineering simulations

Teaching Assistant, University of Guelph, Canada **May 2022 - Present**

- Teaching assistant for the course Design and Engineering 2, mentoring students to design a 3D printed Kinder toy
- Primary responsibilities include monitoring progress, giving feedback, conducting labs and seminars, student consultation, orientation and training.

Mechanical Design Engineer, Larsen and Toubro, India **Aug 2018 - Dec-2021**

- FE analysis, machine design, and detailed engineering of coal pulverizer used in supercritical coal power plants and Stress Analysis of reactor pressure vessels used in chemical and petroleum industries
- Some of the notable projects include stress analysis of World's heaviest LC Max reactor (2200 tons) and World's largest FCC re-generator (22 meters)
- As Digital Enabler, responsible for the implementation of digital technologies to improve and automate design processes and prepare tools for project tracking
- Notable contributions include welding & pipe bending process parameters optimization using machine learning and project tracking platform using Power BI

CERTIFICATIONS

- Introduction to Machine Learning in Production - Coursera
- Deep Neural Networks with Pytorch - Coursera
- Finite Element Methods for Problems in Physics - Coursera
- Lean Six Sigma White Belt - Binghamton University