Vishal Radhakrishnan

Coded Website Portfolio | LinkedIn | vishal.radhakrishnan@mail.utoronto.ca

EDUCATION

University of Toronto (UofT) Sep. 2019 – Jun. 2024

B.A.Sc. Mechanical Engineering Graduate with Honours *Toronto, ON*

- **Courses**: Statistical Reliability & Maintainability (3.7), Probability & Statistics (4.0), Numerical Methods (4.0), ML Fundamentals (EXT), Control Systems (3.7), Engineering Analysis (4.0), Computational Fluid Dynamics (4.0).
- **Scholarships**: UofT International Scholar, Canadian Association of Radiation Oncology, Members of International Schools.
- **Specializations**: Robotics Minor and Engineering Business Certification; Mechatronics, Solid Mechanics, and Design.

TECHNICAL SKILLS

Data: Excel, SQL, AWS, , MS Access, MS Power (BI, Automate, Apps), R, VBA, CEM Selector.

Programming: Python(Pandas, NumPy, Matplotlib, TensorFlow, spaCy NLP, scikit), R, MATLAB (OpenCV), C, Arduino.

Design: Solidworks, AutoCAD, Fusion 360, ANSYS (FEA, CFD, Thermal Electric), Simulink, TinkerCAD, Pspice.

Other: MS Project, MS Office Suite, Git, Pivot Tables, Financial Modeling, Monte Carlo Simulations.

PROFESSIONAL EXPERIENCES

TC Energy - Regulatory and Special Programs, Data Analytics May 2022 – Apr. 2024

Pipeline Integrity Engineering Intern *Calgary, AB*

- Leveraged **SQL** and **VBA** to integrate historical pipeline test data with inspection data for 100+ miles of pipeline.
- Secured **1st place** in a **Robotic Process Automation** competition by developing a document data Extract, Transform, and Load (**ETL**) system, saving over **1150 hours** in manual data processing.
- Conducted **predictive risk analysis** and extracted failure data from over 3000 pages to mitigate stress corrosion cracking.
- Created 2 **Power BI** dashboards to visualize **SCADA** operating pressure data and manage departmental workflow.

Pipeline Integrity Data Engineering Part time *Remote, Toronto, ON*

- Led a document searching tool development project by implementing **spaCy NLP** models on 0.4TB OCR text data.
- Developed document geotagging and clustering algorithms using **scikit** that reduced document searching time by over 30%.
- Delivered **presentations** about Data Centric Solutions with NLP to **over 100 employees** in 2 departmental meetings.
- Curated the training dataset by implementing **relational database** concepts with S3 data using **AWS Athena** queries.

Clean Energy Lab - UofT Scarborough Mar. 2021 – Jan. 2023

Researcher - Computational Chemistry *Toronto, ON*

- Enhanced **Li-ion battery** and **hydrogen storage** materials search by minimizing molecular geometry energy for 72 compounds.
- Improved prediction of material properties by 15% using **crystallographic CNN** and leveraging Niagara Supercomputer.
- Awarded the J. Edgar McAllister Foundation Undergraduate Research Fellowship of **$7000** by UofT Engineering.
- Publication: Strain **Data Augmentation** enables machine learning of inorganic crystal geometry optimization

Engineering Outreach Office - UofT May. 2021 – Apr. 2022

Instructor – Python and Web Development *Toronto, ON*

- Taught STEM workshops in **circuit** fundamentals, **python**, and **web development** for **over 200** middle-school students.

ACADEMIC PROJECTS

Radiotherapy Planning Lung Robot - London Regional Cancer Program Sep. 2023 – Sep. 2024

- Designed a **robotic tool** with 6 synchronous motors to replicate 6-DOF beathing motion of tumors with **< 1mm** accuracy.
- Programmed a **MATLAB** app and the **microcontroller** for motion data transmission with **< 100ms** delay time.
- Selected to present at the Canadian Association of Radiation Oncology conference as a **top Multidisciplinary Capstone** Project.

Statistical Reliability and Maintainability Modeling Jan. 2024 – Apr. 2024

- Optimized preventive maintenance and conducted predictive risk analysis for HVAC in building setups and locomotive engines.
- Reduced annual maintenance costs by 15% and system downtime by 27% and utilized **Excel** and **AzureML** on **R**.

Plant Leaf Disease Detection Jan. 2022 – Apr.2022

- Integrated **ResNet50** with a multi-layer perceptron classifier in a **transfer learning** approach.
- Achieved classification across 20 types of plant diseases with a test set accuracy of 86%.

Key Performance Indicators (KPI) for Vehicle Choices Sep. 2021 – Dec. 2021

- Performed a comparison between ICEV's and HBEV's, evaluating **economic feasibility** and reporting **investment risks**.
- Utilized Excel for financial modeling and **Monte Carlo simulations**, enhancing decision-making for vehicle investments.

EXTRACURRICULARS

Certifications: LinkedIn AI Engineering Essentials, Predictive Analytics Essentials, Python & Excel Data Science, Power BI Essentials, and Build a Generative NLP model (2024), George Brown Machining (2023), Autodesk Associate in CAD (2021).

Clubs: Interplanetary Space Exploration Team - Web Developer (website), Oxygen Production System Lead (2020 - 2022).

Conferences: International Pipeline (2022), Banff Pipeline (2023), Canadian Radiation Oncology (2024).