Shirley Zhang
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Education

- **Stanford University** — Palo Alto, CA
  Master of Science in Civil Engineering - Sustainable Urban Systems — *Expected Mar. 2024*
  - **Courses:** Data Analysis for Urban Systems, Deep Multi-task Meta Learning, AI Applications in AEC, Mining Massive Datasets, Natural Language Processing, Machine Learning with Graphs, Deep Reinforcement Learning
- **University of Toronto** — Toronto, Canada
  Bachelor of Applied Science in Civil Engineering, Minor in Artificial Intelligence; ***GPA: 3.95/4.0*** — *Apr. 2022*
  - **Courses:** Data Structures, Software Engineering, Intro to ML, Applied ML, Intro to AI, Data Science

Work Experience

- **Data Science Engineering Intern** — Stanford, CA
  Stanford University, Energy Operations Department — *Oct 2022 – Present*
  - Improve campus load forecasting and equipment monitoring using data mining and ML tools in **Python** and **SQL**.
- **Civil / Nuclear Engineering Intern** — Toronto, Canada
  Terrestrial Energy — *Sept 2020 – Aug 2022*
  - Designed the reactor building and reactor vessel support structure for Generation IV nuclear power plants.
  - Researched and developed **Python** scripts that interfaces with commercial structural design software through an API to perform aircraft impact analysis; presented methodology and results at a **global nuclear conference**.
- **Structural Engineering Intern** — Toronto, Canada
  Arup — *Jun 2020 – July 2020*
  - Developed computational modules for a **C#** application that automates engineering calculations and streamlines iterative design processes via dynamically generated web APIs to accelerate project delivery by 10%.
- **Software Developer Intern** — Toronto, Canada
  Rocscience — *Apr 2019 – Aug 2019*
  - Researched & implemented computational features for a 3D geotechnical analysis, design, & visualization software.
  - Designed backend and UI using **C++** to compute seismic-induced foundation settlement and compare ground improvement techniques, leading to 2 successful software updates reaching hundreds of engineers / users in industry.

Industry ML Projects

- **Geological Image Segmentation using Computer Vision** — Toronto, Canada
  Kore Geosystems — *Apr 2021 – Apr2022*
  - Collaborated with a mining engineering start-up to develop an ML workflow using **Python** and **PyTorch**-based image processing techniques that sped up the traditional visual inspection process by 10x with 90% accuracy.
  - Trained, optimized, and deployed a **U-Net** model as a web application to perform semantic segmentation on broken rock, optimize image quality, localize fractures, and calculate geological measurements based on area.
- **Predictive Maintenance for HVAC Systems** — Toronto, Canada
  Modern Niagara Group — *Sept 2021 – Apr 2022*
  - Reduced equipment downtime by 50% for a building services company by implementing **RNN** time-series prediction models and an unsupervised anomaly detection algorithm on airflow sensor data using **Python** and **PyTorch**.
  - Designed and implemented end-to-end ML pipeline from data wrangling to deployment as an interactive dashboard.

Personal Projects

- **In-house Structural Analysis Software**: Led 30-person teams to achieve **Top 3** at national & international competitions; Developed **Python** and **C++** applications with **Qt GUI** to display design choices & configurations in 3D.
- **Course Selection Website**: Implemented user log-in, intelligent search algorithm, enrollment cart, and discussion board following the Agile software development life cycle using **Flask**, **Jinja** and **AWS (DynamoDB, Lambda)**.

Skills

- **Programming Languages**: Python, MATLAB, C++, SQL, R, C#, HTML/CSS, JavaScript, Java, Excel VBA
- **Frameworks & Libraries**: PyTorch, Tensorflow, Pandas, Numpy, Scikit-learn, Jupyter, Qt, Flask, AWS, Docker