(778) 237-5533
keeganmjgreen@gmail.com
Ottawa, ON

KEEGAN GREEN

MOTIVATED · ADAPTABLE · DEPENDABLE

SOFTWARE SKILLS

- **Python** · NumPy, SciPy, scikit-learn, Pandas, GeoPandas, Shapely, Kedro, SQLAlchemy, Pydantic, pytest
- Machine learning
- MLflow
- Git
- Linux
- Docker
- CI/CD
- Relational databases (PostgreSQL) and ORMs
- Grafana

WHERE I EXCEL

- Showing initiative in end-to-end problem solving, from conception to deployment
- Creating reusable, well-tested, and fast software
- Considering all aspects of a problem, from technical to green energy implications

EXPERIENCE

Optimization Engineer 2022 – Present
BluWave~ai Ottawa, ON

- Created, evaluated, and deployed novel load predictors for Prince Edward Island and Mumbai, which outperformed the baseline by 17%
  - By helping utilities purchase green energy in advance, this is a tool for reducing emissions
- Created a data ingestion pipeline to get hourly updates on how much power Prince Edward Island is consuming and generating from wind and solar, to feed ML inference
- Developed and deployed an optimization service to reduce strain on the electrical grid by controlling grid-scale batteries and hundreds of EVs, for an ongoing EV Everywhere program with Hydro Ottawa
  - Created an algorithm that controls EVs' charging to consume power when the energy mix is green
- Developed and deployed software to optimally control a solar-powered hydrogen production and storage system, extending its component lifespan while generating electricity from green hydrogen at high-demand times
- Collaboratively developed, and deployed, a cloud service that sends timely and helpful charging station recommendations to EV taxi drivers based on location
  - Helped progress the pilot project with the taxi company to the next stage by using GeoPandas to create a real-time simulator of EV taxi fleet operations that was showcased at COP28
  - Made an interactive tool using Plotly, OpenStreetMap, and the Google Maps API to help automate the process of finding and categorizing charging stations
- Developed and deployed prototype optimizers of electric bus charging operations for multiple transit agencies in simulation
  - Created optimization models for peak energy use and energy cost minimization in a model predictive control scheme, used in a simulation study for many Ontario school bus depots
- Created a library used by multiple projects for testing smart grid control software in a variety of simulated environments
- Co-inventor on five patents, including for the real-time, data-driven minimization of cost and greenhouse gas emissions with EV charging stations

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EDUCATION

BASc Mechatronic Systems Engineering 2016 – 2021
Simon Fraser University Vancouver, BC

- 3.67 CGPA; President's Honour Roll, three-time Dean's Honour Roll

PERSONAL PROJECTS

Simulation of Mid-Air Refueling of a Hydrogen-Powered Airliner 2023 – Present

- Design and feasibility study determining how to refuel a sustainably-powered commercial airliner
- Developed a 3D computer simulation of mid-air refueling by cargo UAVs, using map data and realistic flight paths
- Created a flight controller UI mockup

Author of multiple Python libraries 2024 – Present

- Applications span signal resampling, Pandas/dataclasses interoperability, and ease of writing explainable, traceable, and auditable Python programs

Series About Energy, Renewables, and Climate Change 2022 – Present

- A series of web postings of interesting, significant, and actionable facts and pieces of information about energy, renewables, and fighting climate change

Cluedo Game Simulator and AI Assistant 2023

- Wrote software guaranteed to beat human players at Cluedo by solving the game as a Boolean satisfiability problem
- Made an interactive player dashboard to visualize game and simulation results

IoT Integration of a Hydroponic Farm 2022 – 2023

- Created an IoT dashboard and Python-based interface for remote monitoring & control
- Developed a farm process model for minimizing consumption of energy and resources
- Completed the first phase on-time to successfully control the farm across Canada

Energy Yield Model of a Gas Turbine 2021

- Performed statistical analysis and trained machine learning models on sensor data
- Verified, visualized, and reported model performances

Model of Fuel Cell EV Air Supply System for Optimization 2020

- Identified the potential for optimization among car manufacturers
- Defined an empirical relationship between fuel cell humidity and performance
- Numerically modeled turbo compressor to feed fuel cell oxygen