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

KEEGAN GREEN

MOTIVATED · ADAPTABLE · DEPENDABLE

SOFTWARE SKILLS

- Python · Pandas, NumPy, SciPy, Plotly/Dash, Kedro, SQLAlchemy, Pydantic, pytest
- Relational databases (PostgreSQL) and ORMs
- Docker
- Machine learning
- Git
- Jenkins-based CI/CD
- Linux
- Grafana
- Go
- Basic Java

WHERE I EXCEL

- Demonstrating initiative in end-to-end problem solving, from conception to deployment
- Creating beautiful, well-tested, and fast software
- Considering all aspects of a problem, from technical to environmental implications

EXPERIENCE

Optimization Engineer 2022 – Present
BluWave~ai Ottawa, ON

- Developed and deployed prototype optimizers of electric bus charging operations for multiple transit agencies in simulation, leveraging GTFS schedule data
  - Created optimization models for minimizing energy use and cost, used in a simulation study for many Ontario school bus depots to show that electric buses can be used for 95% of routes
  - Set up streaming of GTFS realtime data into an internal database
- Created, evaluated, and deployed novel pipelines for predicting the load of Mumbai and Prince Edward Island electrical grids, outperforming the baseline model by 17%
  - Developed an SFTP data ingestion pipeline using Apache NiFi, automating the collection of daily load and renewable generation data
- Developed and deployed a cloud service that sends timely and helpful charging station recommendations to EV taxi drivers based on location
  - Created a real-time simulator of EV taxi fleet operations, showcased at COP28, essential to progressing the pilot project with the taxi company to the next stage
- Created a library for testing our smart grid software systems in a variety of simulated environments, using HTTP endpoints for interoperability and helping to validate our software prior to controlling real devices
- Developed, deployed, and maintained an optimization service to reduce strain on city electrical grids by controlling grid-scale batteries and hundreds of EVs, for an ongoing program with Hydro Ottawa
  - Created an algorithm that controls EVs' charging to consume power when the energy mix is green, thereby reducing emissions
- Developed and deployed a pipeline 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
- Co-inventor on three patent applications for BluWave's EV Fleet Orchestrator system
- Co-inventor on a patent application 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
- 4.33 GPA in statistics and optimization courses

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 AT200 cargo UAVs
- Created a flight controller UI mockup, just for fun

SignalPerfect Python library for signal resampling July – Dec 2024

- Derived a special class of quadratic spline for resampling time series data
- Used a number of linear algebra computing strategies to reduce complexity from $O(n^3)$ to $O(n)$

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 Feb – Mar 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 Sep 2022 – Jan 2023

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

Energy Yield Model of a Gas Turbine Jan – Feb 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 Mar – May 2020

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