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

KEEGAN GREEN

MOTIVATED · ADAPTABLE · DEPENDABLE

SKILLSET

Software Engineering

- **Python** · Pandas, NumPy, SciPy, Plotly/Dash, Kedro, SQLAlchemy, Pydantic, pytest
- **Optimization** · Pyomo, Cbc, GLPK
- Go
- Git
- Linux
- Docker
- CI/CD
- Relational databases (PostgreSQL) and ORMs
- Grafana
- Machine learning
- MLflow
- Basic Java
- MATLAB/Simulink and Optimization Toolbox

Control Systems

- Modern optimal and digital control
- Modeling and simulation

Electrical Systems

- Power and signal electronics analysis
- Digital design
- Microcontrollers and single-board computers
- Real-time systems

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

- Developed, deployed, and maintained 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
  - 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
- Developed and deployed prototype optimizers of electric bus charging operations for multiple transit agencies in simulation
  - Created optimization models for peak-shaving 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
- Created, evaluated, and deployed novel load predictors for Mumbai and Prince Edward Island (which outperformed LGBM by 17%)
- Completed a 10-megawatt peak-shaving study for the city of St. John's grid
- 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

Systems Engineering Co-op Sep – Dec 2020
Jastram Engineering Vancouver, BC

- For steering systems on naval frigates:
  - Developed documentation for security, safety, risk management, and failure analysis
  - Verified conformance of electrical systems to NATO standardization agreement
  - Successfully performed vibration analysis for hydraulic power units in Python

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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 engineering 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

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

Optimization of a Telescopic Handler Mechanism 2020

- Applications in structural engineering and robotics
- Verified and visualized solution to 1000-variable optimization problem obtained using tuned gradient-based and genetic algorithms