Warren G Holley

Software Developer, Data Scientist, Automation Specialist.

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Experience

Satellite Operator, Software Developer, Sys. Admin – CASSIOPE Satellite – University of Calgary

Aug 2018 – Mar 2025

- Software development in various languages, focusing on automation. (*Python, Bash, Perl*)
- Maintenance of legacy and public software. *(Python, Perl, Matlab, Fortran, Java, IDL)*
- Development of cross-system interfaces & APIs. *(SQL, Flask)*
- Database & Dataset administration & development. *(MySQL)*
- Server & Network administration & deployment. *(Ubuntu, Red Hat, Windows)*

Volunteer Developer, IT & Helpdesk – Vancouver Community Network

May 2018 – Aug 2018 (Temporary Volunteer)

- Developed software for server and user account management. *(Bash, Python, CMD)*
- Provided technical support for VCN's various services. *(Dial-up internet provider, web hosting)*

Construction Labour – Kingdom Builders

June 2016 – Aug 2016 (Summer Job)

Warehouse Picker – Fairview Fittings

July 2015 – Aug 2015, December 2015 (Summer job, holiday work)

Projects

CASSIOPE Operations Automation

CASSIOPE Project – Continuous – Python, Bash, Perl, CMD, Fortran

- Reduced maintainance of the satellite from ~6-10 man-hours per day to less than 1 man-hour per day.
- Reduced downtime of the satellite during campaigns.
- Improved science-data production by maximizing instrument duty cycle via automated scheduling.
- Implemented numerous fixes that reduced Operator headache overall.

Orbit & Attitude Determination System

CASSIOPE Project - Completed 2019 – Python, Numpy, C, MySQL

- System for Back-Orbit Analysis of CASSIOPE ephemeris & attitude telemetry.
- Binary data parsing & translation (ETL) using C for accerated processing.
- API interface to AGI STK (Satellite/Systems Tools Kit) through the Windows COM API.
- Data processing using Python & Numpy, telemetry pushed to data warehouse and MySQL database.

e-POP Ephemeris Library (https://epop.phys.ucalgary.ca/data/)

CASSIOPE Project – Initial Deployment 2021 – Python, Numpy, MySQL

- Public, Open-Source Python Library for improving public access to the CASSIOPE/e-POP dataset.
- Designed as a library to simplify atmospheric science processing for both public and internal use.
- Provides various frame transformation (GEOPACK 08, ICRF, ITRF, Body frames) for science processing.
- Provides a simplified API to access internal and external databases.

Education

B.Sc., Natural Science - Concentrations in Computer Science and Mathematics - University of Calgary

Sept 2011 – Dec 2016

- **Computer Science**

  Academic focus in data science. Academic projects include database design and development *(MySQL)*, embedded systems development *(Atmel AVR, ARM Cortex)*, and a suite of software for high-integrity data administration with corruption resistance and recovery (*Python, Bash*).

- **Mathematics**

  Academic focus in data-science related fields. Calculus, Linear Algebra, and Computational Mathematics. Academic projects included data analysis, statistics, and applied cryptography.

Publications

‘In situ calibration of the Swarm-Echo magnetometers’ https://doi.org/10.5194/gi-11-323-2022
ESA Funded Publication - In collaboration with the University of Iowa
‘cavsiopy’ https://pypi.org/project/cavsiopy/ https://doi.org/10.5281/zenodo.8361256
Zenodo Publication - In collaboration with the University of Saskatchewan
A very early implementation of the CASSIOPE Ephemeris Library.
‘Attitude effects on the observed orientation angle of HF waves from the Radio Receiver Instrument on e-POP/Swarm-E’
Zenodo Publication - In collaboration with the University of Saskatchewan https://doi.org/10.5281/zenodo.7964200
‘SWARM-Echo Ephemeris & Attitude Determination System’
ESA Funded - Initially presented at ESA’s SWARM 2022 Data Quality Workshop.
A presentation describing the ‘Orbit & Attitude Determination System’ listed under Projects.

Skills

Technical

Programming languages: Python, C/C++, Java, Matlab, MySQL, Fortran
Frameworks/tools: VSCode, Eclipse, Git, SVN, NumPy, Conda/vEnv/UV
Web Platforms: Apache, nginx, Flask, Gunicorn
Dev platforms: Linux *(Ubuntu, Debian, Red Hat Enterprise)*, Windows *(7, 11, Server)*, Embedded Systems *(Arm Cortex, Atmel AVR)*
Systems Administration: Docker, Proxmox/KVM, OPNSense, various security tools.
Space Domain: AGI STK & ODTK, GEOPACK.

Misc.

Supplementary Education: Electrical Engineering, Economics, Chemistry.
Hobbyist Skills: Electrical Engineering (*Power Systems, Automation, Robotics*)
Skills In-Development: Rust, Go, C#, T-SQL, CUDA/OpenCL, TensorFlow