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SUMMARY

Data analyst with a background in physics. Experience in a collaborative software development environment as a controls engineer at SLAC National Accelerator Laboratory. Skills include Python, SQL, MongoDB, JavaScript/HTML, and PLC programming (Beckhoff). Highly organized with experience balancing multiple responsibilities and a dedicated learner with a passion for problem solving. Quantitative analysis experience in a variety of technical environments and excellent written/oral communication skills to express ideas and learn from others.

TECHNICAL SKILLS

Languages: Python, C++, SQL, JavaScript ES6+, HTML5, Matlab, Experimental Physics and Industrial Control System (EPICS), PLC

Applications: Numpy, Pandas, Matplotlib, Flask, SQLAlchemy, PostgreSQL, MongoDB, D3.js, Plotly.js, Leaflet.js, Bootstrap, EPICS Display Manager, Tc2_MC2

Tools: Jupyter Notebook, Excel/VBA, Tableau, Beckhoff, Visual Molecular Dynamics, Git/GitHub

Concepts: ETL, Data Visualization, Linux

PROJECTS

Mapping Earthquakes | https://github.com/jsheppard95/Mapping_Earthquakes

Web application with interactive maps of cities, airports, airline routes, and earthquakes from local JSON/JavaScript files and API calls to USGS GeoJSON sources.

- Role: Sole author
- Tools: JavaScript, Leaflet.js, D3.js, Mapbox, Python

Mission-to-Mars | <https://github.com/jsheppard95/Mission-to-Mars>

Interactive web scraping application acquiring Mars images, news articles, and tabular data, storing using MongoDB, and then visualizing in a Flask application.

- Role: Sole author
- Tools: Python, Splinter, bs4, Pandas, Flask/Flask-PyMongo, MongoDB, Jupyter Notebook

Movies-ETL | <https://github.com/jsheppard95/Movies-ETL>

ETL pipeline application for movie data acquired from Wikipedia and Kaggle, cleaned using Python, and loaded into two tables in a local PostgreSQL database.

- Role: Sole author
- Tools: Python, json, Pandas, Numpy, re, SQLAlchemy

lcls-twincat-optics | <https://github.com/pcdshub/lcls-twincat-optics>

PLC library for LCLS optics designed with LCLSII-style Beckhoff motion control architecture.

- Role: Created function blocks to control six fixed axes of motion required for LCLS optics including coordinated gantry motion. Updated equipment protection interlock and stepper/piezo motor state machine.
- Tools: PLC, Beckhoff, Tc2_MC2

lcls-plc-lfe-optics | <https://github.com/pcdshub/lcls-plc-lfe-optics>

PLC project for deployed LCLS optics MR1L0 and MR2L0 relying on lcls-twincat-optics library.

- Role: Defined motion axes for MR1L0 and MR2L0 optics and performed system checkouts to ensure motion requirements were satisfied.
- Tools: PLC, Beckhoff, Tc2_MC2, pytmc, EPICS

pcdsdevices | <https://github.com/pcdshub/pcdsdevices>

Collection of device subclasses including LCLS optics defining Python-based interfaces for staff scientists to operate instruments in an IPython session.

- Role: Defined mirror-specific subclasses to create a Python interface to LCLS mirrors relying on PLC control and saved device class instances in a database for automated deployment during user experiments.
- Tools: Python, Ophyd, Numpy

EXPERIENCE

Controls Engineer, Casual - Nonexempt
SLAC National Accelerator Laboratory

November 2020 - Present
Menlo Park, CA

Part-time position in the Experiment Control Systems Delivery (formerly PCDS) group within LCLS while attending the UC Berkeley Extension Data Analytics Boot Camp. Responsible for remote support of systems under expertise: motion control for the Offset Mirror System and LCLS-II style Beckhoff motion control systems.

Key Accomplishments:

- Created procedures for setup, basic operation, and troubleshooting motion control systems under expertise.
- Coordinated installation and checkout of motion controls for CVM1 interaction point at the TMO endstation.
- Mentored recent hires and trained coworkers on systems under expertise to create a more uniform understanding within the group.

Science and Engineering Associate
SLAC National Accelerator Laboratory

September 2018 - November 2020
Menlo Park, CA

Controls engineer in the Experiment Control Systems Delivery group within LCLS. During active operations, responsible for experiment setup and on-call technical support for assigned experiments at assigned instruments. Over instrument downtime, responsible for integration of new LCLS-II devices into ECS-developed control systems.

Key Accomplishments:

- Integrated motors, cameras, temperature sensors, timing trigger signals, and other devices into ECS-developed controls software stack for assigned experiments.
- Expanded device support through Python development on a Linux system (IPython sessions containing device objects for specific experiments).
- Deployed a controls upgrade to existing Offset Mirror System to employ LCLS-II style Beckhoff motion hardware and PLC software interface. Coordinated system reinstallation and performed checkout to ensure motion requirements were satisfied. Integrated system into ECS controls stack for use by scientists during experiments.

Summer Student
SLAC National Accelerator Laboratory

June 2018 - September 2018
Menlo Park, CA

Student under the mentorship of staff physicist Claudio Pellegrini. Worked on free electron laser (FEL) beam dynamics simulations using GENESIS and Matlab for preprocessing and analysis.

Key Accomplishments:

- Characterized the undulator “taper profile” by finding the optimal relationship for magnetic field strength as a function of longitudinal distance using simulations and iterative search methods.
- Presented findings in the LCLS Summer Internship Poster Session with other students, mentors, and SLAC faculty (Received 2nd place).
- Published findings in the Journal of Synchrotron Radiation: Halavanau, A., Decker, F. J., Emma, C., Sheppard, J., Pellegrini, C. 2019. Very high brightness and power LCLS-II hard X-ray pulses. *J. Synchrotron Rad.* **26(3)**:635-646.

Undergraduate Research Assistant
University of California, Santa Barbara

January 2018 - June 2018
Santa Barbara, CA

Student in the Shea Group within the Department of Chemistry at UCSB. Participated in computational research that applied statistical and data science techniques to molecular dynamics simulations in order to model complex biological processes.

Key Accomplishments:

- Cleaned and pre-processed data using cluster analysis techniques in Python using NumPy for models built with TensorFlow and Keras.
- Assisted with latent space visualization using Matplotlib.
- Learned to use 3D modeling software Visual Molecular Dynamics (VMD) to visualize protein dynamics.

EDUCATION

Data Analytics Certificate: UC Berkeley Extension, Berkeley, CA

Expected May 2021

A 24-week intensive program focused on gaining technical programming skills in Excel, VBA, Python, R, JavaScript, SQL Databases, Tableau, Big Data, and Machine Learning.

Bachelor of Science, Physics: University of California, Santa Barbara, Santa Barbara, CA

June 2018

GPA: 3.79

Questions:

- Too Long: Take out info? Make font smaller/a bit more variable?
- Include college work experience? I.e teaching physics/test proctoring
- Including any honors/awards? Both at UCSB and at SLAC?
- Includer Coursera Certificate on Mobile Robots Control?