

# Nathan Neibauer

nneibauer044@gmail.com | (970) 301-7133 | linkedin.com/in/nathanneibauer

---

Passionate and creative individual blending strong communication and presentation skills with Python expertise and a solid scientific background. I firmly believe that nothing worth doing is easy, and I pursue every challenge with an open mind, a keen ear, and equal parts gumption and tenacity.

---

## EDUCATION

**M.S. Applied Physics - Optical Materials and Devices**

Aug 2015

*University of Oregon*

**B.S. Engineering Physics**

May 2014

*Colorado School of Mines*

## WORK EXPERIENCE

**Google** | *Mountain View, CA*

*Software Engineer - Data Visualization (Contract)*

Jan 2019 - Nov 2019

Member of 7 person research group at Google working with TAE Technologies (fusion startup) to develop high fidelity plasma models for a nuclear fusion reactor. I was responsible for generating custom data viz solutions in Python and maintaining / owning internal plotting libraries.

- Wrote a visualization library that condensed 1TB of output data into single-screen graphical interface for internal and external customers
- Developed interactive tools for data exploration and analysis of experimental data from fusion reactor
- Designed and implemented refactor of legacy code that significantly reduced plot generation time
- Added small UI feature to Google Colab by interfacing with team in Seattle and writing the necessary unit and integration tests
- Committed 10,872 lines of unit-tested, peer-reviewed Python code to Google's codebase in 9 months
- Invited to present on *Diagnostic Visualization* at Google Applied Science internal seminar

**MKS Instruments (Spectra-Physics)** | *Santa Clara, CA*

*Sr. Optical Engineer*

Feb 2018 - Jan 2019

Member of product development / R&D team working on industrial UV micromachining lasers.

- Performed failure analysis (FAs) on lasers from the field
- Built and documented test stations for component and system level tests
- Developed screening station to identify and filter laser diodes that were out-of-spec. Trained technicians with custom written and video documentation
- Collaborated with Software and Electrical engineering department to troubleshoot board failures and software bugs
- Designed and implemented Python communication library for standard lab equipment ( $M^2$  box, power meter, mechanical flip mounts, oscilloscope). Used library to automate data acquisition and augment station capabilities
- Improved testing time from 10 engineer-hours to 1.5 hours / 0 engineers for a bespoke rigorous screening procedure requested by a customer with several advanced use-cases
- Invited to present on *Python Lab Automation* to entire engineering staff

**Alpha Ring US. Inc** | *Monterey, CA*

*Research Engineer*

Oct 2015 - Feb 2018

Core member at private fusion energy startup, helping the company grow from 4 to 30 employees and acquire \$13 million in series A funding.

- Conceptualized, designed, and built numerous plasma-physics experiments from scratch, starting from the vacuum system and including both diagnostic and control systems
- Developed a spectroscopic analysis and visualization pipeline (using Python and ffmpeg) to identify crucial emission lines and churn out investor-ready videos showing the evolution of specific element signatures over time
- Retrofitted a radio station control room into an analytical optics/plasma lab and built it out myself
- Collaborated with software team to develop LabView-based control system for main reactor
- Packaged complex research data and presented compelling narratives to technical/non-technical VC investors
- Conceptualized, designed and constructed clean proof-of-concept technology demonstrations based on 'frankenstein-esque' laboratory experiments that showed promising data
- Trained and supervised interns working in the laboratory and office

**Newport Corporation (Spectra-Physics)** | *Santa Clara, CA*

*Laser R&D Intern*

Jan 2015 - Oct 2015

Investigated and implemented designs for the next-generation diode-pumped Ti:Sapphire laser and produced meaningful results in bleeding edge laser technology.

- Built entire laser (pump alignment, dispersion compensation, mode-locking device) from scratch
- Wrote Python GUI (PyQt) for data visualization/manipulation and design optimization
- Designed optical experiments to characterize new equipment and troubleshoot peculiar behavior
- Operated characterization equipment in clean-room environment
- Constructed custom prototyping equipment for product development team
- Collaborated with members of several departments simultaneously

Assisted and mentored students during physics, chemistry, and biology labs conducted remotely via Labview modules and real-time video/audio communication.

- Assembled and operated automated microscope systems, spectroscopy systems, and Helmholtz coils
- Assessed and reported quality of students' collaboration, etiquette, and effort during the lab
- Analyzed students' ease in remotely operating the laboratory equipment. Used this data to help streamline the process
- Resolved problems in real time by troubleshooting equipment and connectivity issues while students were in session

## INDEPENDENT & TEAM PROJECTS

### Ocean Explorer

March 2020 - Present

Independent project | Python | [github.com/nneibaue/ocean\\_explorer](https://github.com/nneibaue/ocean_explorer) | Presentation link

Data analysis and visualization pipeline to assist a colleague in a Geoscience PhD program at Princeton. I have built multiple web UIs in Google Colab (cloud-hosted Jupyter notebook) to explore and filter x-ray spectroscopic data of samples taken from the ocean, with the ultimate goal of gaining insight into relative element concentrations and chemistry at different depths and locations.

- Scheduled all meetings and status updates via Zoom
- Wrote all code myself as the sole developer. Project is currently at 2000 lines
- Used this project to present on *Colab for Collaboration* to 60+ members of the Python community at BayPIGGies (Bay Area Python Interest Group) July 2020 meeting

### GRIN Phase Plate for NASA's James Webb Space Telescope

Aug 2014

NASA and U of O | Python | Dr. Ben McMorran | Dr. Nima Dinyari | <https://github.com/nneibaue/Voxtel-Dither>

Worked with a team of 6 students to design custom optical materials for NASA's James Webb Space Telescope. Built complete GUI in Python (PyQt) in three weeks for efficient real-time lens design based on highly mathematical specifications (Zernike coefficient sets) from NASA.

### Real-time Navigation System in Python

Sep 2012 - Dec 2012

CSM Design II | Python | Golden, CO | Dr. John Scales

Created a stand-alone Python application among a team of physics students to extract and analyze a real-time NMEA data stream from a \$12.00 GPS dongle. Field tested software on highways in Rocky Mountains and outperformed Samsung Galaxy S III's built-in GPS tracking software.

### Bio-Gas Digester for Low-Income Farmers

Sep 2011 - Dec 2011

CSM Design I | Engineering | Dr. Robert Knecht

Designed a system to generate usable fuel from raw animal manure. Won engineering team competition by conceiving a low-budget, easy-to-implement solution and granted travel scholarship to represent Colorado School of Mines at international design competition in Abu Dhabi.

## SKILLS SUMMARY

LABORATORY	COMPUTERS, SOFTWARE	COMMUNICATION, PERSONAL
<ul style="list-style-type: none"> <li>• <b>Optics</b> - optomechanics, laser systems (CW, Q-switched, Ultrafast), detectors, analysis equipment (<math>M^2</math>, oscilloscope, OSA, autocorrelator, spectrometer)</li> <li>• <b>Vacuum systems</b> - pumps, gauges, outgassing techniques, RGA, leak detection, CF/KF standards, feedthroughs, Swagelok components</li> <li>• <b>Electronics</b> - circuit design/analysis, microcontrollers, soldering, breadboards, communication protocols (TTL, rs232, pwm, TCP/IP)</li> <li>• <b>Mechanical</b> - fluid handling parts/fittings, 80/20 components, machine tools (mill, lathe), hand tools, basic load analysis</li> <li>• <b>Other</b> - subsystem integration, equipment installation/calibration, troubleshooting, performance analysis, cleanroom and safety protocols, inventory management, lab organization, vendor relations</li> </ul>	<ul style="list-style-type: none"> <li>• Python programming               <ul style="list-style-type: none"> <li>– <b>Editors</b> - VsCode, Jupyter/Colab notebooks</li> <li>– <b>GUI development</b> - PyQt, ipywidgets, tkinter</li> <li>– <b>Data analysis</b> - numpy, pandas, scipy</li> <li>– <b>Data Visualization</b> - matplotlib, altair, plotly</li> </ul> </li> <li>• Zemax experience</li> <li>• C++ OOP familiarity</li> <li>• Git version control</li> <li>• Unix terminal</li> <li>• Some HTML / JS</li> <li>• LaTeX (this resume, e.g.)</li> <li>• Numerical simulation - Python, MATLAB, Mathematica</li> <li>• SQL database experience</li> <li>• Solid Works experience</li> <li>• LabView familiarity</li> <li>• Design in Inkscape, Blender</li> </ul>	<ul style="list-style-type: none"> <li>• Confident, capable, and enthusiastic public speaker</li> <li>• Adept at delivering technical material to diverse audiences</li> <li>• Genuine human who fosters real workplace connections</li> <li>• Adventurous personality driven by unbounded curiosity</li> <li>• First principles problem solver</li> <li>• Big picture thinker who also loves getting into <i>all</i> the weeds</li> <li>• Recognizes and works within complex incentive structures</li> <li>• Willing and able to adapt to a rapidly changing environment</li> <li>• Strong and versatile writer who can generate reports, documentation, blogs, and stories</li> </ul>