John Feng

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LinkedIn: https://www.linkedin.com/in/john-feng-5735321b8/

Skills: CAD (Autodesk Inventor and Fusion 360), 3D printing, Ultrafast Lasers, Ultra-high vacuum systems, High voltage systems, Writing technical reports, Public Speaking, Data Science, Machine Learning

Education

BSc Physics specialist, Human Biology major - University of Toronto — completed Apr 2013
MSc in Physics - University of Toronto — completed Aug 2014
PhD in Physics - University of Toronto — completed Dec 2022

- Van Kronecker Teaching Assistant Award (2021)
- 3-minute thesis University of Toronto finalist (2017, 2018)

Applied Scientist in Detector Physics team - Redlen Technologies — Oct 2023 - Present

- Build and refine physics-based models of semiconductor materials, studying carrier dynamics, space charge effects, and material defects - work with a small agile team of engineers and scientists.
- Develop and execute test methods to characterize semiconductor devices via electro-optic properties, analyzing results to improve device performance.
- Root cause analysis of our persistent performance issues in our detector product
- Hands on experience in free-space optical alignment, optomechanics, and optical components.
- Software engineering: Code Python scripts for automated data acquisition and analysis, maintain proper version control and documentation with GitHub. Hand-over packaged software for other users.
- Write reports and present project plans, proposals, and results for technical and business audiences.
- Project Management: Communicate with vendors, understanding technical details of hardware before purchasing. Create detailed parts lists for project proposals. Assess risk of failure in projects.
- Proficient in CAD software such as SolidWorks, Onshape - design custom hardware for lab work.
- Refine apparatus to pass Gauge Repeatability and Reproducibility standards.
- Data Science: Very proficient in Python (Pandas, Matplotlib, Plotly, Streamlit, Numpy, Scipy), JMP Statistical Software, COMSOL. Familiar with MATLAB and Monte-Carlo simulations.

AI developer (contractor) - Aggregate Intellect — May 2023- Sept 2023

- College admissions chatbot helper: Scrape college websites for admissions details and program specific information using Python Scrapy
- Created automated chatbot with Python backend for answering international college admission query
- Applied AI Retrieval Augmented Generation method in backend
- Work in a small agile team of front-end developers and project manager
- Contribute to free open-source community-driven project slack agent (Sherpa AI) for querying slack conversation history and database.

Research Assistant at University of Toronto — Sept 2016 - Dec 2022

My primary Ph.D. research project was the design and construction of a novel >100kV electron accelerator with semiconductor photocathode source - Ultrafast Electron Diffractometer. This is a complex apparatus built for the purpose of probing matter at the atomic scale in ultrafast timescales. I led the planning, design, construction, and other technical work throughout this project. [Link to PhD Thesis]

- Plan, manage, build full lifecycle of complex engineering project ($300k total cost) from initial conception to hardware prototype
- Developed Python-based software for instrument control and data processing
- Hands-on experience with various lab equipment: electronics, lasers, nonlinear optics, ultra-high vacuum
- Modeled accelerated electron pulse dynamics with C++ based particle simulation software
- Experience in vacuum engineering, high voltage engineering (>100kV), high voltage conditioning, CAD design, programming for instrument controls, data analysis, ultrafast lasers, and basic electronics
- Coordinate the design, manufacture and procurement of specialized high voltage and ultra high vacuum components from various vendors and cross-functional teams world-wide
- Writing comprehensive reports, creating conference posters, and presentations about my project for a technical audience and lay audience