Christopher J. Bolig

SOFTWARE ENGINEER · PHYSICIST · ELECTRICAL ENGINEER

Arlington, VA

954-812-9461 | chris.j.bolig@gmail.com | ⌂ | ○ | ▮ | in

Education

Johns Hopkins University | Whiting School of Engineering   *Baltimore, MD*

M.S. IN APPLIED PHYSICS   *Spring 2025 - PRESENT*

- GPA: 3.87
- Part-time, Hybrid

Florida International University | College of Engineering & Computing   *Miami, FL*

B.S. IN PHYSICS, DOUBLE MAJOR RF ELECTRICAL ENGINEERING   *Spring 2018 - Fall 2020*

- IEEE-published senior project
- Three-time Dean's List
- Physics Lab Assistant: Physics with Calculus I & II, Upper Division Intermediate Physics Lab

Skills

Programming	Python (NumPy, PyTorch, Scikit-learn, Matplotlib), C/C++, JavaScript, GLSL, Embedded C
Cloud & DevOps	AWS, Azure, Git, CMake, Docker, Linux, macOS, Windows
Embedded	ARM Cortex-M, STM32, Espressif, I2C/SPI/UART protocols, WiFi IoT, PCB Design
Web Development	Flask, Django, SQL/SQLite, Nginx, Gunicorn, HTTPS/SSL
Data Analysis	Numerical Methods, Monte Carlo, Signal Analysis, Machine Learning, Data Visualization, Algorithm Optimization
3D Graphics	OpenGL, WebGL, GLSL Shaders, Three.js, Ray Tracing, GPU Programming
Gov. Contracting	Program and people management, Client delivery, Handling data at different levels of clearance

Clearance

Active Department of Defense Top Secret/SCI Eligible

Experience

ExoAnalytic Solutions   *Arlington, Virginia*

SOFTWARE ENGINEER | SPACE MODELING & SIMULATION   *Oct. 2022 - Present*

- Developed a WebGL 3D Earth satellite model with Python/C++ APIs, now a core feature in ExoAnalytic's commercial satellite monitoring product.
- Designed and implemented a 2D Euler fluid simulator in Python to model small debris pieces in the Low Earth Orbit (LEO) belt. Results presented at the 2023 AMOS Conference.
- Led a team of three engineers to build high-performance object detection software. The software alerted objects of interest at a processing rate of 30:1 (processing 30 seconds of high resolution video per second of computation time).
- Built and deployed Ubuntu-based customer web applications in both AWS and Azure cloud services. Docker and Git used for deployment and version control.
- Developed and packaged custom C++ extensions as Python wheels for ExoAnalytic's Python repositories. Distributed Linux, macOS, and Windows wheels using Pybind11 and CMake.

Whisker Labs   *Germantown, Maryland*

SOFTWARE ENGINEER | OPERATION ENGINEER MANAGER   *Feb. 2021 - Sep. 2022*

- Managed a remote team of six core operations engineers responsible for sensor analysis. Oversaw team scheduling, conducted weekly meetings, led new-hire training, and ensured efficient team performance.
- Developed multiple machine learning algorithms to support house fire detection, including a TensorFlow-based convolutional neural network (CNN) image classifier and a fast Fourier transform-based failing transformer detection algorithm.
- Identified hazardous radio frequency signals from Ting sensor data to proactively detect electrical arcing related to potential house fires. Coordinated and managed repairs of arcing faults in residential electrical systems.
- Presented my published research on failing transformers on behalf of Whisker Labs at Georgia Tech's 2022 Fault Disturbance Analysis Committee.

Encompass

Davie, Florida

Software Engineer

Apr. 2020 - Feb. 2021

- Built web-scraping software and applications to streamline data extraction and automate downloads of high-resolution image. Processed tens of thousands of open-source images using the Python Imaging Library (PIL).

Publications

AMOS Conference

Maui, HI

Fluid Dynamics Simulator

Sep. 2023

- Developed a finite difference solver for the Euler equations of hydrodynamics, modeling compressible fluid flow in 1D/2D.
- Applied core CFD techniques (e.g., conservative variables, shock capturing) to simulate realistic high-speed gas dynamics.
- Utilized NumPy and OpenCV for custom visualizations and analysis.

Georgia Tech Fault Disturbance Analysis Planning Committee

Atlanta, GA

Using Secondary Voltage Data to Detect Struggling Distribution Transformers

Jul. 2022

- Used statistical methods to detect data that indicates a failing distribution transformer.
- Applied Fourier analysis on high-resolution sensor data enables automated daily categorization and alerts.
- Published an explanatory paper and presented findings at Georgia Tech's 2022 Fault Disturbance Analysis Committee.

Institute of Electrical and Electronics Engineers

San Diego, CA

Wireless Power Transfer System

Aug. 2021

- Constructed a 250 kHz wireless power transfer circuit in collaboration with Florida International University's Electrical Engineering Department.
- Numerical analysis on circuit data found a systematic method to measure static material's effect on wireless power transfer.
- Published findings in the IEEE journal: *Wireless Photonic Sensors with Flex Fan-Out Packaged Devices and Enhanced Power Telemetry* (IEEE).

Check out my online resume: chrisbolig.com