Carl Kolon

carlkolon.com | carl@kolon.org | /in/carl-kolon/ | (802) 825-6319 | github.com/cckolon | scholar

I am a full stack and AI engineer with a strong mathematical foundation. I write APIs, frontend applications, and performant backend code. Before that, I spent 5 years leading engineering and safety teams aboard nuclear submarines. I hold a TS/SCI clearance.

EDUCATION

US Naval Academy – B.S. Mathematics (Distinction and Honors).
3.89 GPA, Trident Scholar, Julian Clancy Frazier Mathematics Research Award, Chinese Minor.
Thesis: *Stability of Nonlinear Swarms on Flat and Curved Surfaces.*

PROFESSIONAL EXPERIENCE

Senior Forward Deployed Software Engineer: Vannevar Labs (Apr 2025 – Present)

- Built our economic analysis platform frontend, backend, and data platform from nothing.
- Contribute code to almost every project in the company, from mature to experimental products.
- Promoted from intern to senior faster than anyone else in Vannevar's history.

Forward Deployed Software Engineer: Vannevar Labs (Jun 2023 – Mar 2025)

- Managed a LLM API deployment to government customers as the lead dev/main point of contact.
- Built my company's geospatial tool, with a fast ~10b row database and feature-rich frontend.

Nuclear Submarine QA/Safety Officer: US Navy (May 2018 – Jun 2023)

- Built a culture of compliance with rigorous SUBSAFE standards.
- Led 62 nuclear trained sailors and responsible for $1 billion of equipment.
- Selected as Submarine Junior Officer of the Year for 2022.

ACADEMIC EXPERIENCE

Researcher: US Naval Academy (Trident Scholar) (Mar 2017 - May 2018)

- Proved novel math results about the stability of swarm models, a nonlinear dynamics problem.
- Presented my work at UMD, SASMC, and Trident Scholar Conferences.

Research Intern: Naval Research Laboratory (Jun 2017 – Jul 2017)

- Swarm collisions with delay coupling.

ACADEMIC WORK

- C. Kolon, C. Medynets, I. Popovici. *On the stability of Rotating States in Second-Order Self-Propelled Multi-Particle Systems.* 2023.
- Presented *Seeing Underwater with Neural Networks* at Google X Tidal Ocean Seminar, Jun 2023.
- Presented *Stability of Nonlinear Swarms on Flat and Curved Surfaces* at UMD Graduate Mathematics Seminar, Apr 2018, Service Academy Student Mathematics Conference, May 2018, and Trident Scholar Conference, May 2018 (video).
- C. Kolon and I. Schwartz. *The Dynamics of Interacting Swarms.* 2017.

PROJECTS - *These and many others are described fully on my blog.*

- A RNN-based sonar processing algorithm that outperforms the Navy's current tools.
- A semantic search tool for the Navy's longest manual.
- A multiplayer submarine combat game that runs in the browser.
- An in-port ship scheduler that writes fair watchbills with simulated annealing.

SKILLS

Professional Experience In: Python (Django, FastAPI), Typescript/Javascript (Node.js, React), Containerized Environments (Kubernetes, Docker), Temporal, SQL (PostGIS/Postgres, SQLite), Vector DBs (Qdrant, PGVector), training ML models (Pytorch), deploying ML models (Ray Serve).
Academic Experience In: Tensorflow (certified), Wolfram Mathematica, LaTeX, Robotics Simulation.
Hobby Experience In: Liquid (Jekyll), C#, C++, R, Gusek, Ruby, QGIS, Rust.
Language Skills: Working proficiency in Mandarin. Lived in Beijing for 9 years