Christopher Kodama

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Profile

Seasoned software engineer and military veteran with 8+ years of experience designing solutions in dynamic, fast paced environments. Proficient in a wide variety of programming languages, frameworks, and system administration tools.

Education

M.S. Electrical Engineering 4.0 *Air Force Institute of Technology* **Dayton, OH** *2014-2016*
B.S. Electrical Engineering 4.0 *Rose-Hulman Institute of Technology* **Terre Haute, IN** *2010-2014*

Professional Experience

Lead Engineer, Enterprise IT and DevOps *USAF IT Infrastructure Division* **Lexington, MA** *08/2020 - present*

- Delivered connectivity, vulnerability management, and endpoint security capabilities for 1.2M+ networked devices and over 700K users across 180+ Air Force bases.
- Created infrastructure-as-code (IaC) pipelines in GitLab to rapidly deploy Kubernetes clusters and software-defined networking appliances to military installations. Build steps use Packer, Terraform, Ansible, Bash, and Python.
- Built automated testing environments with Terraform/Ansible to evaluate performance of network equipment in multiple configurations. Identified critical performance limitations of certain vendor products, providing key information for a $300M business decision.

Senior Python Engineer, Electronic Attack Pods *USAF 36th Electronic Warfare Squadron* **Shalimar, FL** *09/2017 - 07/2020*

- Led 11-member team responsible for deploying radar jammer software to over 1,500 combat aircraft, protecting those aircraft and their pilots from being intercepted by enemy missiles. Conducted 800+ hours of hardware-in-the-loop testing at specialized military test environments in order to assess, troubleshoot, and refactor software.
- Built libraries using NumPy for generating complex radar waveforms, and developed a compiler to translate Python code into machine instructions for radar signal processors. Using these tools, formulated over 50 new deceptive jamming algorithms, doubling aircraft survivability rates against 10 foreign weapons systems.
- Developed a Python/OpenCV application to extract and display positional data from video test data in near-real time using machine learning. Enabled rapid evaluation of system performance during test events, saving $10,000 in test-hours during each event.

Data Engineer, Aircraft Analysis *National Air and Space Intelligence Center* **Dayton, OH** *03/2016 - 09/2017*

- Informed U.S. policy makers on the military capabilities of foreign governments by conducting big data analysis of classified signals intelligence gathered from across the globe.
- Modernized legacy Python, Perl, and Bash tools used for manual data analysis and labeling. Interviewed colleagues and identified pain points to target for tool improvement. After implementing UX improvements and new tooling, data input speeds by the team increased by 50%, which accelerated training dataset availability for subsequent machine learning initiatives.

Projects

- **Performance Report Tool:** Developed a React application to help Air Force employees write performance reports and award packages in a standardized format; currently has over 200,000 users. The app utilizes a Draft.js component with event listeners to provide realtime formatting adjustments as the user types. Deployed the website using multiple methods: a GitHub Actions pipeline and via AWS Elastic Beanstalk. Implemented custom website analytics using AWS DynamoDB and an HTTP-triggered AWS Lambda function.
- **Teachable Text Machine:** Made a Svelte/Tensorflow.js web application for building easily customizable text sentiment classifiers, modeled on Google's Teachable Machine project. Uses transfer learning and a human-friendly user interface to allow end users to create their own machine learning models directly from their browser.
- **Web Product Scraper:** Built a full-stack TypeScript application to compare product prices between various e-commerce websites and Amazon. Leveraged the Amazon Seller API to get Amazon product data; utilized HTML output parsing and public API reverse engineering to scrape information from other sites, using ZenRows as a proxy where needed. System is designed for batch processing, with each data processing stage split into a separate service to allow for granular horizontal scaling.
- **Dialogue Summarizer:** Utilized PyTorch on Amazon SageMaker to create a custom Large Language Model that can summarize sentences of text dialogue. Implemented using low-rank adaptation/parameter-efficient fine tuning of the FLAN-T5 model.

- **Home Lab:** Instantiated a private networking and virtualization environment to evaluate and learn various open-source technologies and applications. A pfSense router/firewall and managed Cisco switch provide connectivity to four Proxmox servers. Several applications for home use, such as Home Assistant, Samba, Immich, and Plex, are deployed via Terraform, Ansible, Docker Compose, or Kubernetes.
- **Performance Statement Generator:** Created a proof-of-concept application that uses generative AI to produce realistic Air Force performance records based on an initial user prompt. Trained an Long/Short Term Memory model in Tensorflow from scratch using 80K+ examples scraped from online sources. Deployed the model as part of a static web application, using Tensorflow.js to allow users to directly run the model from their browser.
- **Resume Build Pipeline:** Designed a GitHub actions pipeline for automatic build and release tracking of resumes written in LaTeX.

Skills

- **Software Development:** Python, Perl, Java, Rust, C, Golang, Git, HTML/CSS, JavaScript/TypeScript, React, Svelte
- **DevOps and System Admin:** Bash, PowerShell, Terraform, Packer, Ansible, Kubernetes, vim
- **Network Engineering:** TCP/UDP, DNS, DHCP, VLAN, BGP, Juniper/Cisco/Palo Alto CLI, Wireshark, tcpdump
- **Languages:** Proficient in English and Japanese, Beginner in Cantonese and Mandarin
- **Other:** Active Top Secret (TS/SCI) Security Clearance

Certifications

Professional Cloud DevOps Engineer *Google Cloud Platform* *2024*
Security+ *CompTIA* *2021*

Publications

C. H. Kodama and R. A. Coutu, "THz metamaterial characterization using THz-TDS," *Terahertz Spectroscopy-A Cutting Edge Technology*, p. 103, 2017.

C. H. Kodama, "Tunable terahertz metamaterials with germanium telluride components," *AFIT Theses and Dissertations*, no. 306, 2016.

C. H. Kodama and R. A. Coutu, "Tunable split-ring resonators using germanium telluride," *Applied Physics Letters*, vol. 108, no. 23, p. 231901, 2016.

A. H. Gwin, C. H. Kodama, T. V. Laurvick, C. R. A, and T. P. F, "Improved terahertz modulation using germanium telluride (GeTe) chalcogenide thin films," *Applied Physics Letters*, vol. 107, no. 3, p. 031904, 2015.

C. H. Kodama and R. A. Coutu, "Determining the non-ideal parallel-plate capacitance of a split-ring resonator gap," in *2015 9th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (METAMATERIALS)*, pp. 343–345, 2015.

J. Lohrman, C. Kodama, R. Lake, T. Laurvick, and R. A. Coutu, "Mechanical logic using mems," in *2015 National Aerospace and Electronics Conference (NAECON)*, pp. 245–248, 2015.

C. H. Kodama, C. O'Daniel, J. Cook, F. de Paulis, M. Cracraft, S. Connor, A. Orlandi, and E. Wheeler, "Mitigating the threat of crosstalk and unwanted radiation when using electromagnetic bandgap structures to suppress common mode signal propagation in PCB differential interconnects," in *2015 IEEE International Symposium on Electromagnetic Compatibility (EMC)*, pp. 622–627, IEEE, 2015.

S. G. Kang, G. Shaffer, C. Kodama, C. O'Daniel, and E. Wheeler, "Csrr common-mode filtering structures in multilayer printed circuit boards," in *2015 IEEE International Symposium on Electromagnetic Compatibility (EMC)*, pp. 1300–1303, 2015.

E. Sawyer, C. Kodama, C. O'Daniel, J. Cook, and E. Wheeler, "Using common-mode filtering structures with microstrip differential lines in a multilayer printed circuit board environment," in *2014 44th European Microwave Conference*, pp. 1091–1094, 2014.

Awards and Honors

Company Grade Officer of the Quarter *Air Force Life Cycle Management Center* *2021*
Dean's Award *Air Force Institute of Technology* *2016*
Distinguished Graduate *Air Force Institute of Technology* *2016*
Heminway Gold Medal *Rose-Hulman Institute of Technology* *2014*
Carl Wischmeyer Scholar *Rose-Hulman Institute of Technology* *2014*
Paul N. Bogart Prize *Rose-Hulman Institute of Technology* *2014*
Heminway Scholar *Rose-Hulman Institute of Technology* *2014*
Eagle Scout *Scouts of America* *2010*