
Jess Sullivan

Full Stack Engineer · DevSecOps · Computer Vision · Kernel & Security Research · ML/HPC
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| Languages | ML/AI & HPC | Systems & Security | Infrastructure |
|----------------------|---|---|----------------------------|
| Python | Fine-grained classification | GhidraScript | Nix, Bazel |
| TypeScript, Rust | TensorFlow, pandas | Frida, ILSpy | OpenTofu, Ansible |
| Zig, Chapel, Haskell | NUMA-aware horizontal parallelism | Mitre Caldera | RKE2 (k8s) |
| Go, C++, R, Shell | Realtime model evaluation & SLM inference | SAML , OAuth , TOTP | GitLab AutoDevOps |

Experience

Full Stack Contracting and FOSS

(Ongoing)

Ongoing contributor and community member of numerous open source projects including—and not limited to—the [Apache Foundation](#), [rspamd](#), [Chapel-lang](#), [numtide/nix-vm-test](#), [manaflow-ai/cmux](#), [diku-dk/Futhark](#), [xCaddy](#), [libdns](#), Skeleton UI, [Klipper](#), [Joplin](#), [FFT.js](#), [KeepPassXC](#), [svelte-superforms](#), [ShikiJS](#), [ggplot2](#), the [Rocky Enterprise Linux Foundation](#), [Liqo](#), [Budgie DE](#), [Mason](#), along with authoring numerous FOSS automation tools, libraries and open source utilities. Expanded client list and customer references available upon request.

- Startup work: [Dover Micro](#) (2017), [Adaptive Motorsport](#) (2018)
- Web GIS tools for [National Park Service](#), [Foundation for Healthy Communities](#), [GPRED](#), [Northern Border Regional Commission](#). Presented at 2019 [AAG Annual Meeting](#) in Washington, DC (§3).
- Fine-grained image classification with [MushroomObserver.org](#) and [Visipedia](#); early adopter of CNN-based species ID at scale.

Current stack:

- **Web:** [SvelteKit](#) (Runes), [Bun](#), [Vite 3](#) (Rolldown), TS7. Auth, scheduling, mapping, telemetry and site systems including [this SvelteKit repo](#), [tinyland-auth](#), [scheduling-kit](#), and [scheduling-bridge](#).
- **HPC:** [Chapel](#), [Haskell](#). Performance-oriented systems and property-based testing.

Research:

- **Reverse Engineering & Binary Analysis:** [GhidraScript](#), [Frida](#), [ILSpy](#), [Mitre Caldera](#), [Zig](#). Firmware RE and [NVMe XRAM recovery](#) (see §3).
- **Author of numerous Zig capability libraries** with C ABI surfaces: [zig-crypto \(docs\)](#), [zig-notify \(docs\)](#), [zig-keychain \(docs\)](#), [zig-ctap2 \(docs\)](#).
- **linux-xr** — Rocky Linux 10 RPM kernel lane carrying XR display patches and [Dirty Frag security backports](#). Backported [CVE-2026-31431](#), [CVE-2026-43284](#), and [CVE-2026-43500](#) into 6.1.y ahead of public disclosure.
- **Heterogeneous Compute:** [WebGPU](#), [Futhark](#) (GPU-targeting functional language), deeper WASM integration and WASM-native inference pipelines.
- **Functional Programming:** ESDT Monads and pixelwise classification research ([pixelwise-research](#)). [Rust](#) (SIMD), [Nix](#) (build systems).

Systems Analyst (DevSecOps) @ Bates College

(2024–Present)

Scalable enterprise systems supporting staff, faculty, and ILS team. Legacy modernization; bespoke Ansible extensions/roles/plugins; 24/7 CVE mitigation; SAML and application interoperability; OpenTelemetry reporting; CI/CD pipelines (GitLab AutoDevOps, OpenTofu, RKE2 + Rancher); leading IaC adoption college-wide.

Noteworthy projects:

- Developed high performance orchestrator and instrumentation tooling for degree management and degree auditing software in [Haskell + Python](#) (QuickCheck, Cabal, podman-compose for development, FPM for packaging and autodevops for CI/CD); uplifted “unautomatable” 1980s morris-worm era code unique to higher ed into a verifiable, traceable, k8s friendly workload
- Overhauled and completely automated the lifecycle of our event management system (extensive development in [C#](#), [Go](#), [Ansible](#))

- Led adoption of horizontally scalable [Apache Solr](#) instances for multiple public and private indexing and search applications
- Led adoption and built out numerous internal ACME-first certificate management and DNS libraries, templates and tooling
- Extensive work and peer education around enterprise secret management patterns and SAML at the college. Developed numerous SAML integrations, LTI integrations, Shibboleth and led adoption of [KeePassXC](#) as part of a declarative Ansible workflow.

Fabrication Laboratory Manager @ Cornell CALS

(2021–2022)

Developed and taught rapid fabrication curricula. [OpenSCAD](#), [Fusion 360](#), [Inkscape](#), [C++](#). [GitHub/Linear](#) project management.

Computer Vision Software Engineer @ Macaulay Library, Cornell Lab of Ornithology

(2018–2022)

Developed & launched [Merlin Sound ID](#), a production fine-grained audio classification system now used by millions worldwide. Led R&D on internal ML annotation tooling, model evaluation APIs, and end-to-end MLOps pipelines. Built real-time inference demos deployed at scale.

Stack:

- **Model Training:** Python ([TensorFlow](#), [NumPy](#), [Pandas](#), [Matplotlib](#), [Jupyter](#))
- **Web & Inference:** [Flask](#), [TypeScript](#), [React](#), [Vue](#), [Docker](#), [WebAssembly](#), [React Native](#), [Swift](#)
- **Infrastructure:** [EC2](#), [Heroku](#), [BitBucket](#) CI/CD, production model deployment at scale

Volunteer & Community

First Fellow @ D&M Makerspace, Plymouth State University

(2017–2020)

Taught **Advanced GIS Programming & Intro to Electromechanics**. COVID-19 response: coordinated regional makerspace network for medical PPE manufacturing.

Membership Chair & 3D Printing Captain @ Ithaca Generator

(2020–2022)

Led 501(c)(3) makerspace through rapid growth; coached hundreds via “Fusion 360 for 3D printing” series.

Publications

Reitsma, L.R., Burns, C., & **Sullivan, J.** (2019). *Poecile atricapillus* (Black-capped Chickadee) Feeding *Catharus guttatus* (Hermit Thrush) Nestlings. *Northeastern Naturalist*, 26(2). doi:10.1656/045.026.0213

Sullivan, J. (2026). Recovering Write-Protected NVMe SSDs Through USB Bridge XRAM Injection: Bypassing the ASMedia ASM2362 Firmware Opcode Whitelist. [recovery-paper.pdf](#)

Presentations:

Sullivan, J. (2019). Web GIS: Telling Stories & Solving Problems. *Association of American Geographers Annual Meeting*, Washington, DC.
