Ryan Garfinkel

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Education

University of Central Florida Expected Graduation: May 2031
Doctor of Philosophy in Computer Science *Orlando, FL*
- Advisors: Paul Gazzillo & Aashish Yadavally

University of Central Florida May 2026
Bachelor of Science in Computer Science, Minor in Data Science *Orlando, FL*
- GPA: 3.97

CodePath
Technical Training Programs *Remote*
- Courses: TIP 102 (Spring 2025), iOS 101 (Summer 2025), AI 101 (Spring 2026), AI 301 (Summer 2026)
- Peer Mentor Program: Summer 2025, Fall 2025

Publications

Garfinkel, R. *KBootRepair: Automated LLM Guided Repair of Linux Kernel Boot Failures.* UCF STARS, 2026.

Talks & Presentations

Automatically Securing Development Pipelines with Agentic AI. Talk, Sonoma State University CS Colloquium, 2026.

KBootRepair. Poster, UCF CS Research Symposium, 2026.

Teaching Experience

Fall 2025 – Spring 2026 **Undergraduate Learning Assistant**. COP 3502C. University of Central Florida.

Fall 2024 – Summer 2025 **Undergraduate Learning Assistant**. COP 3502C. University of Central Florida.

Fall 2023 – Spring 2024 **Undergraduate Learning Assistant**. COP 3502C. University of Central Florida.

Work Experience

Research Assistant May 2026 – Aug. 2026
APPLeSEEd Lab *Orlando, FL*
- Expanded KBootRepair to ARM, achieving 94% success and 92% overall success across 100 configurations.
- Compared Gemini Pro (90%) and Flash (78%) success rates in KBootRepair, finding Flash raised repair cost by 17%.
- Broadened undergraduate thesis with additional evaluation and analysis of KBootRepair's repair behavior.

Software Engineering Intern June 2025 – May 2026
Precisely *Remote*
- Shipped accessibility improvements across 15+ UI components for keyboard navigation and screen reader support.
- Reduced Chromatic false positives by 60% by making Storybook tweaks used in UX regression reviews.
- Refined color palettes to meet WCAG standards, ensuring compliance and better readability for users.

Undergraduate Learning Assistant Aug. 2023 – Apr. 2024, Aug. 2024 – May 2026
University of Central Florida *Orlando, FL*
- Mentored 750+ CS1 students on data structures and algorithms in C, supporting understanding of core concepts.
- Facilitated weekly recitations and office hours, guiding students with debugging, exam prep, and assignments.
- Led 61 one-on-one tutoring sessions, resulting in improved performance on exams and boosting confidence.

IT Intern June 2023 – Aug. 2023, June 2024 – Aug. 2024
Vertical Bridge *Boca Raton, FL*
- Automated transaction document workflow to SharePoint with UiPath, saving 2+ hours of manual processing per day.

- Built dynamic site-summary generator in C# with QuestPDF, accelerating marketing team's ability to promote sites.
- Engineered Angular dashboard to visualize 6+ site metrics, enabling leadership to make data-driven decisions.
- Standardized UI components and improved styling with SCSS, boosting consistency across 7+ pages.
- Integrated Azure SQL data with Angular and C# webpage to forecast tower cash flow, supporting financial planning.

Projects

PipelineSpec | *Python, LangChain, Z3, Docker, mitmproxy, eBPF*
- Engineered a system to infer least-privilege GitHub Actions permissions by tracing local runs with act.
- Extracted workflow conditions with an agent and solved them with Z3 to generate diverse pipeline variants.
- Traced network, file, and credential access via mitmproxy and eBPF to build per-workflow access maps.
- Built a mocking agent that stubs missing secrets and failed network calls to unblock runs.

KBootRepair | *LangChain, Python, krepair, Gemini API*
- Engineered an agentic system to repair Linux kernel boot misconfigurations, achieving a 92% overall success rate.
- Leveraged query and formal reasoning tools to cut input tokens by 60% and output tokens by 89%.
- Analyzed repaired configurations, finding that 85% of the original configuration was preserved.

AskPolaris | *React, Flask, Azure*
- Engineered document ingestion pipeline with a review process before entering RAG knowledge base.
- Built pre-ingestion quality checks covering document similarity, grammar, and spelling to maintain data integrity.
- Built upload and review pages enabling uploaders and reviewers to collaborate before document approval.

Courtly | *Next.js, Gemini, MongoDB, Auth0*
- Awarded 2nd Place Best Consumer App at HackTech (Caltech) for SideShift challenge with a Supreme Court simulator.
- Engineered a 9-judge Gemini system with majority-vote verdicts and real-time AI coaching to stress-test arguments.
- Cached case summaries in MongoDB to eliminate redundant generation on repeat case lookups.

Overcharged | *Unity, MongoDB, C#*
- Won 3rd Place in the Next Era: Energy Efficiency Challenge at Knight Hacks VII by building a Unity game.
- Designed login and leaderboard UI to track scores and foster competition among players.
- Implemented 4 C# endpoints, connecting Unity with MongoDB for persistent player data.

Cohab Roommate App | *Node.js, MongoDB, Express.js, Socket.io*
- Developed instant messaging feature with Socket.io, enabling real-time conversations between users.
- Built RESTful API with Express to authenticate requests and maintain user data.
- Implemented email verification with Nodemailer, strengthening account security.

DevTutor | *Next.js, MongoDB, Google Gemini, Vercel*
- Built AI tool in 12 hours at GemiKnights hackathon to teach devtools through interactive conversations.
- Integrated ReadableStream for real-time feedback, improving responsiveness and perceived interactivity.
- Designed React Context to manage state and data flow across 4 pages, reducing prop drilling.
- Applied iterative prompt engineering to improve explanation quality and progression.

Bridgly | *Next.js, MongoDB, Google Gemini, Auth0, Vercel*
- Built a full-stack app at HackDartmouth X to onboard university students with tailored courses to improve engagement.
- Implemented secure authentication using Auth0 with email/password and Google OAuth login, protecting user data.
- Finetuned Gemini prompts to reduce irrelevant responses by 30%, improving course quality.

Digit Recognizer | *Tensorflow, Keras, scikit-learn, Pygame*
- Developed ML model using Tensorflow and Keras to recognize handwritten digits with 98% accuracy.
- Built real-time demo with PyGame, allowing users to interact with the model and test accuracy.
- Validated model performance with scikit-learn, ensuring reliability against noise.

Contact Manager | *PHP, Digital Ocean, SwaggerHub*
- Built 6 API endpoints to perform CRUD operations on users and contacts.
- Authored API documentation using SwaggerHub to enhance developer usability.

Technical Skills

Languages: Python, Java, C++, C, C#, TypeScript, JavaScript, HTML
ML/AI: Agent Systems, Gemini, LangChain, RAG, TensorFlow, scikit-learn
Frameworks & Data: React, Next.js, FastAPI, MongoDB, MySQL, pandas, NumPy
Developer Tools: Git, Docker, GitHub Actions, Jira, Postman

Awards & Honors

ORCGS Doctoral Fellowship | University of Central Florida 2026

Honors in the Major, B.S. Computer Science | UCF Burnett Honors College 2026

President's Honor Roll | University of Central Florida 2023 – 2026

2nd Place, Best Consumer App | HackTech, Caltech 2025

3rd Place, Energy Efficiency Challenge | Knight Hacks VII 2024