# Will Guffey

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## Summary


- Strong Python and C++ development experience in autonomous systems (low-latency path planning, computer vision, state machines), data processing, automated testing, cloud infrastructure, and AI.
- Comfortable and experienced in translating academic literature into software.
- 8 years of professional software development; 5 years included engineering management.
- Excellent at rapid prototyping and building strong cross-functional relationships.
- Deep Linux experience; comfortable with *nix systems in general.
- Tenacious problem solver with an academic mindset and passion for performance engineering.


## Education

**University of North Carolina at Chapel Hill** — Chapel Hill, NC

BA Mathematics, BA Physics — Aug 2015 - May 2018

*Note: All math/physics major related classes were completed in 5 semesters. In January 2018 I started working full time. Due to an accounting error on the part of UNC, I had 1 credit hour remaining in May 2018, which was satisfied in Summer 2024, making the official confer date Aug 2024.*

## Work Experience

**Tenfour AI** — Pasadena, CA

*Co-founder / Chief Product Officer / Lead Software Engineer* — Apr 2024 - Dec 2024

- **AI order taking system**: Built a proof-of-concept order taking system for restaurants. A demo of an early version of this system can be seen **here**. Lots of hands-on experience testing and fine-tuning models, working with data for model training, and designing low-latency and reliable agentic workflows.
- **Automated testing for AI systems**: Built testing framework for the order taking system. This involved automated tests for speech-to-text and order prediction systems.

**Miso Robotics** — Pasadena, CA

*Simulations Intern (May 2017) → Robotics Engineer (Jan 2018) → Senior Robotics Engineer (Jan 2020) → Lead Robotics Engineer (Mar 2021) → Software Engineering Manager (Apr 2022 - Apr 2024)*

- **Team leadership**: Led the robot movement team, which was responsible for all software related to moving our 7 DOF fryer cooking robot.
- **Robot behavior platform**: Created framework for defining robot behaviors. Notable aspects of this framework were its well-defined configuration management and automated testing systems.
- **Motion planning**: Responsible for and worked heavily on our path planning stack, including a custom implementation of Trajopt for kinematics planning and an MPC layer for dynamics and trajectory smoothing.
- **Observability platform**: Made significant contributions to our observability platform, including data lake architecture, setting up dashboards/alerts on Grafana and led the team's adoption of them.
- **Academic research engagements**: Led two collaborations between Miso Robotics and Caltech's AMBER lab (premier robotics research lab led by prof. Aaron Ames).
- **Other notables**: Computer vision performance engineering, extrinsic camera calibration routine, system identification, scheduling algorithms, custom state machines, and CI/CD architecture.

## Skills

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| Programming languages: | Python (advanced), C/C++23 (STL, templates, metaprogramming), JavaScript, SQL, Bash |
| Frameworks/Platforms/Libraries: | React, NextJS, LangChain, Docker, OpenCV, Pytest, Unittest, ROS, Gazebo, git, GitHub Actions, Jenkins, Grafana, Terraform, SQLAlchemy, Kubernetes, Ansible, PUML, debuggers (pudb, gdb, Valgrind) |
| Cloud specific: | AWS (Step Functions, Athena, S3, Glue Crawler, IoT Greengrass, Lambdas, etc), GCP (cloud functions, container registry, etc.) |
| Soft skills: | Engineering management, strategy and alignment between orgs, project planning, translating academic literature to code |
| Fundamentals: | Optimization problems, Model Predictive Control, Networking (TCP, Modbus), PDEs, Linear algebra, Statistics |

## Papers and patents (Google Scholar)

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| Papers: | Safety-critical manipulation for collision-free food preparation (**Finalist for Best Paper at IROS 2022**), Direct collocation for dynamic behaviors with nonprehensile contacts: Application to flipping burgers |
| Patents: | Automated bin system for accepting food items in robotic kitchen workspace |