Noah **Gardner**

Software Engineer · Research Scientist

ngngardner@gmail.com ngngardner Noah Gardner

Education

Kennesaw State University — Kennesaw, GA

Master of Science in Computer Science — May 2022

Kennesaw State University — Kennesaw, GA

Bachelor of Science in Computer Engineering — May 2020

Skills

- **Languages:** Python, Go, Julia, Nix
- **Technologies:** Git, Linux, Docker, PyTorch, OpenCV, SQL, GCP

Experience

Software Engineer — Atlanta, GA

NCR Voyix — June 2022 - Present

- Architected and maintained a cloud-based computer vision service to classify produce at self-checkout kiosks, scaling the system to support over 1,000 stores, 10,000 SCOs, and 1 million daily requests.
- Developed the core service using Python and FastAPI and engineered the data pipeline with GCP Dataflow to process and save image data.
- Trained and deployed computer vision models on GPU-accelerated platforms to deliver real-time predictions.
- Established key performance indicators (KPIs) to evaluate model relevance and performance, creating a live dashboard in GCP Monitoring to track production model accuracy and operational health.
- Mentored and onboarded new software engineer interns, guiding their project contributions and fostering their technical development through code reviews and regular feedback.

Graduate Research Assistant — Kennesaw, GA

Kennesaw State University — May 2020 - September 2022

- Engineered a reinforcement learning model to predict wrist motion direction from 2-channel sEMG data, achieving 92% accuracy by combining a Convolutional Neural Network (CNN) for deep feature extraction with an A2C actor-critic agent.
- Architected and trained a Deep Q-Network (DQN) for robotic path planning, pioneering the use of Dijkstra's algorithm to generate expert demonstrations which significantly accelerated model convergence.
- Developed the novel Iterative Self-Organizing Data Split (ISODS) algorithm to initialize cluster centroids, improving clustering performance for ISODATA and K-Means on benchmark UCI and hyperspectral imaging datasets.
- Conducted a comparative study classifying ant species by cuticle texture, demonstrating that deep learning methods achieved higher accuracy than statistical methods. The top model, a Deep Residual Pooling (DRP) network, achieved a 0.92 F1-score.

Software Engineer Intern — Atlanta, GA

NCR — May 2021 - August 2021

- Co-developed a production-bound retail microservice in Go to enable lottery ticket sales at self-checkout (SCO) kiosks, integrating with lottery provider APIs and physical receipt printers.
- Improved developer productivity by creating a template-based tool to auto-generate Go decorators for tracing and logging, substantially reducing boilerplate code.
- Contributed to a patent-pending system for a Paperless Lottery service, allowing users to digitize and track physical tickets via a mobile application.

Software Engineer Intern — Atlanta, GA

NCR — May 2020 - August 2020

- Developed the complete backend service for a mobile self-checkout solution using Go, the Echo web framework, and PostgreSQL; the application was successfully deployed in NCR's live test store.
- Secured 3rd place in a global NCR hackathon (2,400+ participants) for contributions to the patented NutriVerify application, including co-designing the core system diagram.

Research Assistant — Kennesaw, GA

Kennesaw State University — Jan 2019 - May 2020

- Improved a robot's wandering algorithm efficiency by 70% by developing an optimized, vision-based obstacle avoidance system using edge detection.
- Engineered the robotic platform by integrating a Raspberry Pi camera with a microcontroller and developing the serial interface to the motor controller.

Innovation Technologist Intern — Atlanta, GA

Emerson Commercial & Residential Solutions — May 2019 - August 2019

- Engineered a Python scheduling service that monitored an Azure PostgreSQL database for tasks, launching background threads to run analytics on refrigeration time series data (temperature, power, etc.).
- Designed and developed a web dashboard to present analytics results, enabling technicians to visualize key performance metrics from refrigeration systems.
- Implemented a Redis caching layer for frequently requested data to improve dashboard performance and reduce database load.

Patent Applications

METHODS AND A SYSTEM OF ITEM NUTRITION INFORMATION PROCESSING — NCR, Atlanta, GA — September 2020

PAPERLESS TICKET MANAGEMENT SERVICE — NCR, Atlanta, GA — September 2021

TARGETED GAMIFIED ECOMMERCE SERVICE — NCR, Atlanta, GA — November 2021

DELAYED ITEM TRANSACTION PROCESSING — NCR, Atlanta, GA — December 2022

ITEM SIMILARITY ANALYSIS FOR THEFT DETECTION — NCR, Atlanta, GA — June 2023

IMAGE PROCESSING FOR DISTINGUISHING PRODUCE-RELATED CHARACTERISTICS — NCR, Atlanta, GA — June 2023

Publications

EMG Based Simultaneous Wrist Motion Prediction Using Reinforcement Learning — KSU, Marietta, GA — October 2020

ISODS: An ISODATA-Based Initial Centroid Algorithm — KSU, Marietta, GA — March 2021

Definition modeling: literature review and dataset analysis — KSU, Marietta, GA — March 2022

Reinforcement Learning Agent for Path Planning with Expert Demonstration — KSU, Marietta, GA — June 2022

Investigation of ant cuticle dataset using image texture analysis — KSU, Marietta, GA — September 2022

Honors and Awards

Eagle Scout — Boy Scouts of America, Lawrenceville, GA — August 2014