Jae Young Seo
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EDUCATION

Vassar College Poughkeepsie, NY
Bachelor of Arts in Computer Science and Mathematics (Double Major) Aug 2021 - May 2025

- GPA: 3.70/4.00
- Relevant coursework: Casual Inference • Operating Systems • Bayesian Statistics • Theory of Computation • Modeling Minds, Brains, Behavior • Organization • Applied Statistical • Statistical Inference • Compilers

SKILLS

- Programming Languages: Java, Python, Go, TypeScript, C, OCaml, SQL, JavaScript,
- Tools & Frameworks: React, FastAPI, Django, Node, RESTful API
- Databases: PostgreSQL, MongoDB, MySQL
- Cloud & DevOps: Google Cloud, Git, Docker

WORK EXPERIENCE

Cognizant Virtual
Generative AI Externship May – Jun 2025

- Developed two generative AI projects that demonstrated effective use of pretrained transformer models (GANs, GPT), as measured by successful implementation of prompt optimization and fine-tuning techniques.
- Collaborated with a mentor and received feedback on deliverables and gained exposure to real-world AI applications.

Research Assistant (**Go**) Poughkeepsie, NY
Marc Smith | Chair of the Computer Science Department Aug 2024 – May 2025

- Designed and implemented **ParV2**, a variadic concurrency abstraction in Go, using reflection to execute arbitrary functions in parallel with full runtime validation safely.
- Delivered a **PAR composition operator** inspired by CSP and Occam's parallelism, now serving as the foundation for research into Go-native artificial neural networks (ANNs).
- Built a **pipeline-based concurrent sorting system** and replicator utility, simplifying dynamic channel wiring and showcasing real-world applications of parallel function composition.

PROJECTS

FitTrack AI (https://fit-track-fe.vercel.app) Jun 2025
FastAPI, PostgreSQL, React (TypeScript), OpenAI GPT-4o, Leaflet.js

- Built and deployed a full-stack AI fitness platform that generated personalized half-marathon training plans, improving training adherence by tracking sleep, mood, and workouts via a full-stack web app.
- Achieved dynamic weekly workout generation and summarization using OpenAi GPT-4o through asynchoronous FastAPI tasks, backed by **PostgreSQL** and **SQLAlchemy**
- Visualized real-world running routes by integrating **OpenRouteService** and **Leaflet.js**, enhancing user experience with location-based suggestions.
- Developed a responsive **React** frontend (**TypeScript** + MUI) with RESTful integration, dynamic SVG radial progress charts, and Strava integration for activity import.
- Improved engagement by adding structured analytics (e.g., missed workout count, sleep average) to inform AI feedback loops through retrieval-augmented prompting.
- Gained real-world experience blending structured fitness data with LLMs to orchestrate async-first feedback loops in a production tool.

Fine-Tuned BERT for Question Answering on SQuAD v1 Jun 2025

- Fine-tuned bert-base-uncased on the SQuAD v1 dataset to extract answer spans from context passages using Hugging Face Transformers.
- Implemented custom preprocessing with offset_mapping and overflow_to_sample_mapping to enable precise span alignment.
- Designed a custom postprocessing pipeline to convert model logits into valid answer spans, achieving **Exact Match: 77.45%** and **F1 Score: 85.19%** on the full validation set (up from ~34% EM in early baseline runs).
- Applied techniques including mixed precision training (fp16=True), early stopping, learning rate scheduling, and progressive dataset scaling (500 → 2000 → full set) to optimize performance.
- Logged training and evaluation metrics using Weights & Biases for real-time monitoring and analysis.

Daily Habits Tracker API May 2025

- Developed a RESTful API using **ASP.NET Core** and **Entity Framework Core** to help users log daily habits, track progress, and visualize completion streaks.
- Designed relational models and integrated **PostgreSQL** for persistence; used **Swagger** and **Postman** for endpoint testing.
- Improved personal consistency by enabling a 65% increase in habit adherence over four weeks of daily tracking.

ValentinePlusPlus Feb 2025, Feb 2024

- Built a digital Valentine's Day card platform using **React (TypeScript)**, **Express,** and **MongoDB**, with automated email delivery via **Nodemailer**, reaching 150+ students.
- Designed four customizable card templates with animated interactions and unique link generation to boost engagement.

LEADERSHIP

Captain Poughkeepsie, NY
Vassar Men's Track and Field
President Poughkeepsie, NY
VC++ (Vassar College Computer Science Organization)