

# Ainesh Chatterjee

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## ↔ Projects

### OpenSkills (active) | Solo Developer

- Open-source, agent-framework-agnostic implementation of Anthropic's Skills protocol with full parity vs their first-party version
- Only open-source implementation with full parity; improves skill activation without manual prompting via a CLI + AGENTS.md-driven spec

### context-mcp (active) | Solo Developer

- Context tooling for agents (ask-docs-agent, fetch-docs, fetch-site) optimized for low latency + token efficiency
- fetch-docs wraps Context7 into a single agent-friendly call, avoiding multi-round tool trips
- Cuts token usage by persisting fetched context locally and avoiding full re-fetches

### climb-cli (active) | Solo Developer

- Auto-generates TUIs for CLIs by extracting arg info + manpages; includes a non-interactive mode for LLM agents
- Eliminates manual CLI argument lookup and reduces agent/human errors

### CoronaSafe | Team Lead/Backend Developer

- Python/Flutter app for global COVID-19 risk assessment using time-weighted foot traffic + urban density analytics
- **Award:** Congressional App Challenge Winner (MD08)

## 🔧 Skills

- **Agents/LLMs:** MCP, Kosong, LMCache, DSPy/GEPA, Claude Code SDK, Google Agent ADK/A2A, LiteLLM, Context Engineering
- **ML:** Transformers, Agentic LLMs, RAG, Mechanistic Interpretability, Deep RL (GAIoO), PyTorch, HuggingFace
- **Engineering:** Python, C/C++, Rust, Docker, Git/GitLab CI, FastAPI, React, AWS, PostgreSQL/NeonDB
  - Familiar: Neo4j, Dask, Java
- **Recognitions:** Congressional App Challenge Winner (MD08), Eagle Scout, National Merit Scholar

## 🎓 Education

### University of Maryland - College Park

*Dual BS in Computer Science (Machine Learning) and Mathematics*

December 2025

University, Departmental Honors; Dean's List

## ☰ Experience

### Tilli Software

*AI Engineering MTS*

*Applied Research: Project ISO*

July 2025 - Present (Full-time since Jan 2026) |

Hybrid

- **Engineered** the Tilli Agent MVP (Kosong + DSPy + lastmileai/mcp-agent) to act autonomously on behalf of users, on any crawled site **at < \$0.01/task**
- **Developed** site2mcp and leading the effort to extract structured data from arbitrary sites and generated template-derived MCP servers (Kosong + browser-use + Claude Agent SDK)
- **Architected** a shared, multi-tenant MCP Super-Server as a centralized auth and tool/resource store across usecases; instrumented automated performance logging for post-hoc analysis and GEPA-optimization pipelines, **increased cache-hit rate; reduced p50 latency and token cost**
- **Driving** Project ISO into closed beta and shipping Bridge, an enterprise ERP-automation offering **~100k users; rolling out for Oracle, SAP, QuickBooks, FreshBooks**

### University of Maryland CMNS

*Student Researcher*

*Crowd Simulation*

September 2024 - June 2025 | College Park, MD

- **Investigated** non-Euclidean formulations for crowd navigation and interaction (Hilbert-ball/hyperbolic distance models; curvature-aware interaction costs)
- **Applied** transformer-based models to language-directed crowd navigation, mapping natural-language instructions to motion goals and primitives

### Johns Hopkins University Applied Physics Laboratory

*Computer Science Intern - Interim Security Clearance*

*Force Projection Sector: Ocean Systems & Engineering Group*

May 2024 - Aug 2024 | Laurel, MD

- **Developed** an optimized GAIoO variant leveraging architectural insights that **improved long-horizon performance versus prior iterations that already outperformed baselines imitation models**
- **Extended** GTRI's SCRIMMAGE mass-simulation framework with **higher scenario complexity and expert controller functionality**
- **Revamped** GitLab CI + Docker pipelines to remediate vulnerabilities and improve build efficiency **≈25% faster CI; ≈50% faster builds; ≈40% lower memory footprint for the project-wide Docker base image**

- **Led** the winning team for the sector Intern Challenge, delivering a secure, non-GPS intra-campus navigation prototype

- **Synthesized** state-of-the-art Transformer literature into internal design memos that guided downstream model selection and project roadmap

### University of Maryland MIND Lab

*Research Intern*

*Breathing Analysis Project*

October 2023 - December 2024 | College Park, MD

- **Optimized** dataset ingestion + loading with Dask and multithreading for large longitudinal breathing datasets **≈400%+ higher throughput on high-tens-of-GB/patient-day data; enabled real-time visualization for analysis + feature extraction**

- **Evaluated** breath-segmentation baselines and sequence models (XGBoost, random forests, CRF, LSTM) to improve segmentation consistency

## ☷ Publications

- *ipelets for the Convex Polygonal Geometry*, published at SoCG 2024, 2024

- *AgreeMate: Teaching LLMs to Hagggle*, published at arXiv, 2024