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 (GAIfO), 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 GAIfO 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 Haggle*, published at arXiv, 2024