Ainesh Chatterjee

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⇔ Education

University of Maryland - College Park

Dual BS in Computer Science (Machine Learning) and Mathematics December 2025 | GPA: 3.384 University, CS Departmental Honors; BS/MS; Dean's List

- AI/ML: Graduate NLP; HRI/Embodied AI;
 Computer Vision;; Intro to: Multimodal DL,
 AI, ML, Data Science
- Math: Calc III; Advanced Linear Algebra;
 Differential Equations;; Advanced Calculus;
 Abstract Algebra;; Mathematical Finance:
 Derivatives & Stochastic Models;; Transform
 Methods; Numerical Analysis
- CS: Quantum Computing; Algorithms; Data Structures; Computer Systems; Object-Oriented Programming; Organization of Languages
- Stat: Applied Prob&Stat; Probability Theory

☐ Publications

- Ipelets for the Convex Polygonal Geometry, published at SoCG 2024, 2024
- AgreeMate: Teaching LLMs to Haggle, published at arXiv, 2024

<> Projects

Vizier | Team Lead/ML Developer

- Al-powered personalized newsletter platform; MVP built for Bitcamp 2025
- Test-time MoE agentic architecture improving context retrieval via documentexpert LLMs

QSafe | Solo Developer

- Open-source Python/Rust quantum-safe password manager using lattice-based cryptography
- encrypted CLI-container protocol; MVP for Bitcamp 2023

 CoronaSafe | Team Lead/Backend Developer

Secure Docker manager and end-to-end

Python/Flutter app for global COVID-19 risk

- assessment using time-weighted foot traffic and urban density analytics
 Award: Congressional App Challenge
- Winner: 2021 District MD08
 Recognition: Guest Speaker at 2022 US
- Patent and Trademark Office APPLY
 Yourself event

NLP-driven matching tool connecting

Resourceful | Team Lead/Backend

(NLTK, spaCy, semantic similarity)
 Award: Best Education Award: 2022
 Blairhacks 5 Hackathon

underrepresented students to resources

& Skills

Programming: Python, C/C++, Fullstack Development, APIs, DevOps, Webhosting,

Developer

- Design Paradigms

 Familiar: Java, Rust, Lua, MATLAB,
 Flutter/Dart, HTML5, CSS3,
 - JavaScript, Assembly

 ML/AI: Transformers, Agentic LLMs, MCP,

 Context Engineering, DSPy, GEPA,

GraphRAG, Deep RL,

Algorithms, GANs **Data Science**: Statistical Analysis, Data

Processing

Supervised/Unsupervised Learning, Genetic

- Finance: Brownian Motion, Black-Scholes,
 Arbitrage Pricing, Stochastic Calculus, Delta
 Hedging
- Tools & Technologies: Git, GitHub/Lab,
 Docker, Linux, Bash, WSL2, Python,
 FastAPI, React, Flask, RESTful,
 PostgreSQL, NeonDB, Neo4j, LiteLLM,
 Claude Code SDK, MCP, Google Agent
 ADK, Google Agent2Agent (A2A),
 Pocketflow, OpenAl API, HuggingFace,
 PyTorch, NumPy, Pandas, Dask, NLTK
- Pocketflow, OpenAl API, HuggingFace,
 PyTorch, NumPy, Pandas, Dask, NLTK,
 SciPy, spaCy, scikit-learn, Seaborn,
 Matplotlib, TensorBoard, Selenium,
 BeautifulSoup, LaTeX, PowerShell, Men
- BeautifulSoup, LaTeX, PowerShell, Memory Profiler, ROS, IBM Qiskit, AWS EC2, AWS Fargate, AWS Lambda, AWS S3, AWS Bedrock, AWS SageMaker

teaching, Iterative Experimentation

- Bedrock, AWS SageMaker

 Soft Skills: First-Principles Problem

 Solving, Leadership, Technical Writing, Self-
- Certifications: Complete Linear Algebra -Udemy, Algorithmic Toolbox - UCSD, Game Theory - Stanford
- Awards: National Merit, Dean's Scholarship,
 Eagle Scout, Congressional App Challenge
- Winner, ISKF Black Belt
 Languages: English (Native), Bengali

(Native), Hindi (Intermediate), Spanish

(Intermediate), French (Beginner)

(III) Experience

Tilli Software

AI Engineering Intern

Edge:XDEX:Agent

July 2025 - Present | Remote

Claude Code SDK

 Built an end-to-end MVP of Tilli Agent using Pocketflow and the Google Agent ADK to

act in utility customer web portals

- Designed the Scrape2MCP paradigm to scrape arbitrary sites and extract structured info for API/browser actions, generating template-derived MCP servers with the
- Architected the Tilli MCP Super-Server as a shared tool 'store' for user agents
- Optimized agent deployment stack on AWS Bedrock Agentcore, increasing cache-hit rate; lowering p50 latency and token cost
- Devised automated agent performance logging for asynchronous analysis
- Leading launch of Tilli Agent initially serving 150k+ users; planned rollout to ~3M across Tilli Software's client base

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

Implemented iteratively enhanced

- Generative Adversarial Imitation from
 Observation (GAIfO) agents, substantially
 outperforming baseline imitation models

 Developed an optimized GAIfO variant
- leveraging architectural insights that outperformed prior versions over long horizons

 Enhanced GTRI's SCRIMMAGE mass-
- simulation framework with increased scenario complexity and expert controller functionality

 Revamped GitLab CI pipelines, boosting
- addressing security vulnerabilities
 Optimized project-wide Docker image used across repositories, reducing pipeline build

speed and efficiency 25% while

- times and memory footprint 50% faster
 builds; 40% better memory efficiency
 Led winning team for sector Intern
 Challenge delivering a secure, non-GPS
- Authored literature reviews on SoTA

 Transformer-based models, unlocking direct insights for future project strategies

intra-campus navigation prototype

Research Intern Breathing Analysis Project

University of Maryland MIND Lab

October 2023 - December 2024 | College Park,

Developed a visualization dashboard and dataset structures for large-scale breath-

- data analysis and downstream feature extraction
 Optimized dataset loading with Dask and multithreading 400%+ faster throughput
- Implemented supervised learning approaches for improved breath segmentation
- University of Maryland CMNS
 Student Researcher
 Crowd Simulation

MDExplored applications of non-Euclidean

geometries to crowd navigation and

interaction

September 2024 - June 2025 | College Park,

 Applied transformer-based models to language-directed crowd navigation

University of Maryland CMNS Lead Teaching Assistant

CMSC351H (Algorithms Honors)
 Spring 2024 | College Park, MD
 Co-designed and graded homeworks,

students; held weekly office hours for advanced topic support

exams, and lecture material for 38 honors