

Utkarsh Sonawane

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EDUCATION

The Pennsylvania State University

Bachelor of Science in Computer Science | Capital Honors Program

Harrisburg, PA

Expected December 2028

– **GPA:** 3.53/4.0 | Dean's List

– **Relevant Coursework:** Data Structures & Algorithms, Object-Oriented Programming, Calculus III

TECHNICAL SKILLS

Languages: Python, TypeScript, JavaScript, C++, Swift, SQL

Backend & Systems: FastAPI, Node.js, Express, Flask, REST APIs, Docker, Linux, Git

Data & AI: PostgreSQL, Supabase, pgvector, Vector Embeddings, RAG, NumPy, Pandas, PyTorch

Client & Hardware: SwiftUI, HealthKit, React, Next.js, Tailwind CSS, Arduino, ESP32

PROJECTS

Nytr — Evidence-Driven Decision System | *Python, FastAPI, PostgreSQL, SwiftUI, HealthKit* 2026

- Engineered an evidence-driven nutrition and training system integrating Penn State dining menus, Apple HealthKit, and Hevy through a FastAPI modular backend and native SwiftUI companion client.
- Designed immutable and versioned pipelines for nutrition history, 28-day Theil–Sen body-mass trends, target policies, and workout revisions with PostgreSQL RLS, replay-safe synchronization via durable anchors, and deterministic Decimal analytics.
- Enforced strict dietary eligibility gates, deterministic nutrition calculations, and tombstone deletion semantics; validated with 1,000+ automated tests and physical-device verification.

Clage — From-Scratch NEAT Engine & Artificial Life | *Python, Algorithms from Scratch* 2025 – 2026

- Implemented NeuroEvolution of Augmenting Topologies (NEAT) from first principles in pure Python, including genome encoding, global innovation tracking, structural mutation, topological crossover, and speciation with zero external ML libraries.
- Validated the evolutionary engine on OR, AND, XOR, and sine benchmarks across fixed seeds before deploying it in a 2D artificial-life simulation, backed by 188 passing tests.
- Investigated behavioral diversity across evolved populations; identified a food-density confound in a behavioral metric and excluded it from cross-condition analysis.

Devvy — Developer Infrastructure for Discord IPC | *TypeScript, Node.js, macOS launchd* 2026

- Built a zero-dependency background daemon speaking Discord's local IPC protocol directly through Unix socket discovery, binary opcode framing, handshake negotiation, and backoff reconnect logic.
- Designed priority arbitration across OpenCode, Command Code, and VS Code with TTL-based heartbeat expiry; validated with a 22-script test suite covering race conditions, reconnect resilience, and IPC socket lifecycle.

ScholarAI — Government Scheme Discovery Platform | *Python, PostgreSQL, pgvector, FastAPI* 2026

- Data Engineer on a 5-person team; finalist among 6,081+ participants in the USAII Global AI Hackathon 2026.
- Built a data pipeline parsing 1,000+ scraped government schemes into structured relational models; generated semantic embeddings and loaded them through fault-tolerant batched inserts into PostgreSQL with pgvector.

LEADERSHIP & ACTIVITIES

CS Team Lead & Technical Team Member, IEEE

IEEE Student Branch, Penn State Harrisburg

Harrisburg, PA

Sept 2025 – Present

- Organize and lead technical workshops for students on topics including Markdown, Google Gemini, developer tooling, and applied AI workflows.
- Coordinate technical initiatives and collaborative coding sessions across Computer Science and AI student groups.

Founder & Editor-in-Chief

Glimpse — Student Publication

Dubai, UAE

Jun 2024 – Feb 2025

- Scaled readership from 0 to 250+ subscribers and authored or edited 30+ long-form articles on technology, science, and student life.

HONORS & CERTIFICATIONS

Honors: Finalist, USAII Global AI Hackathon (6,081+ participants) | Capital Honors Program | Dean's List, Penn State

Certifications: Machine Learning Specialization (*DeepLearning.AI*)

Ethics of AI (*University of Helsinki*) | AI Essentials (*Penn State*)