Shouvik Ahmed Antu

AI R&D | Computer Vision | Multi-Modal Learning | LLM Applications
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GitHub | Portfolio | Linkedin

Education

Willamette University — Salem, Oregon
Bachelor of Science in Computer Science and Data Science — Aug-2022 - May 2026
GPA: 3.88

University of Birmingham — Birmingham, England
Computer Science, Study Abroad — Jan 2025 - June 2025
GPA: 4

Publications & Working papers

- (Upcoming) Deutschbein, Calvin, and Shouvik Ahmed Antu. Engaging with the Wiphala: A Code-Generation Hardened CS1 Final. The Journal of Computing Sciences in Colleges.
- (Submitted, pending approval) : Reimagining Education: AI-Driven Interdisciplinary Pedagogical Tool to Combat Instructor Burnout and Boost Student Confidence and Engagement
- Antu, Shouvik, et al. Using LLM (Large Language Model) to Improve Efficiency in Literature Review for Undergraduate Research. 2023, ceur-ws.org/Vol-3487/short2.pdf.
- Antu, Shouvik Ahmed, et al. "An Exploration into the Collatz Conjecture with Changed Parameters." ArXiv.org, 2023, arxiv.org/abs/2305.01017.

Research Experience

Willamette University SCIS | CS Research Assistant — *June 2025 - Present*

- Developing hybrid Deep Learning and Computer Vision models for high-precision image alignment (e.g., homography, optical flow) under challenging visual conditions, integrating neural networks with classic OpenCV techniques.
- Building multi-modal Deep Learning architectures (using PyTorch or TensorFlow) that analyze multiple data streams, like RGB and frequency data, to enhance anomaly detection in digital media.
- Implementing Computer Vision techniques for image forensics, focusing on localizing manipulation by analyzing subtle, high-frequency compression artifacts (like JPEG or DCT inconsistencies).

Willamette University SCIS | SCRP Research Assistant Gen-AI — *May - Aug 2023*

- Co-authored research on an AI-driven pedagogical tool aimed at reducing instructor burnout and enhancing student engagement
- Detailed the architecture of the tool, leveraging Large Language Models (LLMs) for AI-mediated conversations and automated assessments
- Contributed to the design of adaptive AI agents, conceptualizing a RAG framework for personalized learning pathways

Teaching Experience

Willamette University SCIS | Colloquium Associate — *Aug - Dec 2024*

- Assist in teaching the "Thinking Machines" course by leading discussions and guiding students through programming exercises to explore AI and ML concepts.

- Provide academic support and one-on-one tutoring during office hours, helping students understand computational thinking and its societal implications.
- Collaborate with the professor to develop course materials, lead the CHASE session and activities that enhance student engagement and foster student success.

Willamette University | Section Leader *Aug 2025 - Present*

- Led weekly 1-hour lab sections for a cohort of 8-10 introductory Computer Science students to review course material and practice coding.
- Provided targeted academic support as a primary resource, offering one-on-one tutoring, code troubleshooting, and staffing the QUAD help center.
- Evaluated and provided detailed feedback on student projects, collaborating directly with faculty in weekly prep meetings and joint "grading parties" to ensure consistency.

Private Tutor | Independent *2019 – Present (on an ongoing, periodic basis)*

- Provide individualized tutoring to high school and undergraduate students in Introductory Physics, CS1, CS2, Algebra I & II, Precalculus, Calculus, and Introductory Statistics.
- Develop adaptive lesson plans and practice problems tailored to each student's learning style and academic goals.
- Incorporate computational examples using Python and interactive simulations for conceptual reinforcement in physics and statistics.

Work Experience

Willamette WITS | Web Development Intern *May 2023 - Aug 2024*

- Debugged and fixed a recurring PHP database lagging issue, improving data retrieval efficiency and reducing load times.
- Transformed the new student orientation grouping process with a Python-based automation, cutting down the time from days to a mere 15 minutes.
- Implemented PHP code refactoring, which resulted in a 15% increase in application performance.

Willamette University Housing | Resident Advisor *Aug 2023 - Dec 2024*

- Organized need-based initiatives to enhance community bonds and academic development among residents.
- Managed dormitory life, fostering a positive and inclusive atmosphere while resolving con icts e ectively.
- Designed and executed diverse social and educational events, boosting student involvement and cultural awareness.

McMinnville Soccer Club(MSC) | Web Developer Intern *Apr 2024 - Sept 2024*

- Updated and built new web pages, conducting thorough quality assessments including cross-browser compatibility checks and mobile responsiveness testing.
- Rebuilding MSC's entire web communication infrastructure including social media presence.
- Implemented SEO strategies such as keyword optimization, meta-tag enhancements, and backlink analysis to improve website visibility and search rankings.

Skills

- **Languages:** Python, JavaScript/TypeScript, SQL, Bash, PHP
- **AI & ML:** LLMs, RAG, Vector Databases (Pinecone), Embeddings, Fine-tuning, TensorFlow, Scikit-learn Frameworks & Tools: LangChain, LangGraph, OpenAI API, Docker, Firebase/Firestore, Next.js, React, Git/GitHub
- **DevOps/MLOps:** Docker, CI/CD fundamentals, containerized deployment
- **Databases:** PostgreSQL, MongoDB, Firebase Firestore, Supabase

Projects / Open-Source

Oregon Turtles | Link *Nextjs, Supabase, VLM object recognition, Rest API*

- Developed and deployed the full-stack oregonturtles.org web platform alongside native iOS and Android apps.
- Engineered the backend API and database to ingest and synchronize citizen-science data from web and mobile clients.
- Built the front-end web reporting module and native mobile (iOS/Android) clients for public data submission.

Pedalogical | Link *ASP.NET, Blazar, PostgreSQL, C#, JavaScript*

- Architected an AI pedagogical tool to operationalize and test the integration of SDT, PBL, and ZPD learning theories.
- Engineered an AI-mediated assessment module with adaptive questioning and Feynman Method integration to research impacts on student confidence.
- Developed a full-stack research prototype featuring an instructor dashboard and an AI question-generation tool for automated data collection.

Engaging with the Wiphala | Link *Python, HTML, RevealJS*

- Authored research on a "code-generation hardened" CS1 nal that assesses computational thinking via AI-resistant image analysis tasks.
- Engineered the exam's core Python project, a generative art pipeline requiring NumPy array manipulation and image processing from scratch.
- Designed the exam's scaffolded structure and cultural context to connect the technical task to the societal impacts of code generation.

Certifications

- Building Autonomous AI Agents with LangGraph 2025 - Coursera
- Introduction to Artificial Intelligence (AI) 2025 - Coursera - IBM
- Fundamentals of AI Agents Using RAG and LangChain 2025 - Coursera - IBM
- Generative AI Advance Fine-Tuning for LLMs 2025 - Coursera - IBM
- Supervised Machine Learning: Regression and Classification 2024 - Coursera - AI
- Crash Course on Python 2020 - Coursera - Google

Presentations

- **Engaging The Wiphala, Consortium for Computing Sciences in College**
  - Rocky Mountain, Utah | Oct, 2024
- **AI in Education: Empowering Instructors, Engaging Learners**
  - Student Scholarship Recognition Day, Willamette University | April 2024
- **Large Language Models in Higher Education: Applications & Uses**
  - Techbytes, Willamette SCIS | Oct 2023
- **Using LLM to improve Literature Review Efficiency**
  - AI4ED Workshop - Tokyo, Japan (Virtual) | Sept 2023

Awards & Honors

- Mary Stuart Rogers Scholar - Willamette University, 2025
- Full Tuition Scholarship - Willamette University, 2022-2026
- Fairweather Scholarship - Willamette University, 2022-2026
- Honor Roll - Willamette University, 2022, 2023, 2024
- Youth Exchange and Study (YES) Scholar - Full scholarship to study an academic year in the US, 2021-2022
- Student of the Year - Bangladesh International School and College, Dhaka | 2019

Clubs & Organizations

- **Computer Science Club, Willamette University** — Active member participating in technical workshops and coding projects.
- **Willamette ICBSC Team (2026)** — Selected team member representing Willamette University in the International Collegiate Business Strategy Competition, contributing to simulation-based business and strategic decision-making.
- **Willamette University Club Volleyball** — Captain & Treasurer; lead the competitive volleyball club and organize tournaments and practices.
- **Gladiator Volleyball (Semi-Professional Team)** — Compete in regional-level volleyball events and maintain advanced athletic performance.
- **Willamette Intramural Sports Program** — Regular participant in campus-wide recreational sports fostering teamwork and community.