Tushar Billakanti

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Education

Memorial University of Newfoundland **Sept 2020 – Dec 2024**
Bachelor of Science in Computer Science (Honors) - 3.57/4.0 GPA
Minor: Business Administration
Dean's List 2020-21

Certifications

- **AWS** - Solutions Architect Associate **Jan 2025**
- **University of Michigan** - Front-end Developer **May 2020**

Skills

Languages – Python, Java, C / C++/ C#, SQL, JavaScript (ES6), VBA
Frameworks – React, Angular, Next.js, Node.js, React Native, Flask, Django, Figma
Libraries – TypeScript, Unity, GraphQL, Blender, ShadCN, Tailwind
Cloud & DB – AWS, Firebase, MongoDB, PostgreSQL, Docker
Version Control – Git, Bitbucket
Testing – Postman, Replit

Professional Experience

Undergraduate Research Developer **Jan 2024 – Dec 2024**
Memorial University - Human Computer Interaction Lab

- Coauthored a paper "Comparing Pinch and Point Poses for Stroke Drawing in Virtual Reality" with Dr. Jay Henderson.
- Built and designed an Unity VR app with ECS architecture for a robust game-like experience to allow users drawing on multiple surfaces with various hand poses.
- Implemented algorithms to optimize user experience like procedural mesh generations for 3D drawing, ray-casting, filters to reduce hand tracking jitters, data structures to collect points for analysis.
- Tech stack: Python, MATLAB, Unity, C#, ShaderLab, Meta Oculus SDK.

Front-End Developer (Intern) **Apr 2023 – Dec 2023**
Carnegie Learning - Zorbit's Math

- Developed and maintained the product dashboard, contributing to 10+ projects focused on implementing new features and internal testing tools. Significant bug-fixing, code refactoring to ensure smooth re-branding of the product.
- Designed reusable Angular components, services, and modules, enhancing code scalability and maintainability by 25% in key features like student performance reports, teacher resources, district and school profiles.
- Implemented analytical strategies by leveraging Pendo, to track user interactions with features within the product, enabling a 40% improvement in product decision making because of quality data points.
- Tech stack: Angular, TypeScript, Git, Node.js, Transloco, Tailwind CSS, Pendo, jsPDF.

Full Stack Developer Student **Apr 2022 – Sep 2022**
Memorial University - DIAG Lab

- Worked in a team developing issue/ticket management system for a machine learning lab detecting medical images.
- Tech stack: React, PostgreSQL, Django, Flask, Docker.

Projects

WebApp for LLM Study (Personal Project) **Jan 2025**

- Developed a full-stack web platform to study various form functions of user interactions with large language models (LLMs) and generative AI, focusing on user experience.
- Leveraged OpenAI's API for text and image generation, AWS S3 and DynamoDB for real-time survey data collection.
- Provided a valuable survey application that streamlines the process for researchers to gather data for HCI studies on scale.
- Tech Stack: React, Typescript, AWS S3, AWS DynamoDB, OpenAI API, Express, Render, Vercel, Tailwind, Framer Motion.

FlirtIQ: Pickup Lines Rater (School Project) **Dec 2024**

- Built a web app that rates pickup lines using six NLP systems ranging from simple Bag-of-Words to advanced GPT models.
- Benchmarked sentiment systems across weak, mid, and strong NLP methods, showcasing progressive improvements in contextual understanding and model accuracy.
- Designed to study sentiment analysis in contextually limited text; demonstrated how model complexity affects interpretability, runtime, and sentiment quality.
- Tech Stack: Python, Flask, Transformers (HuggingFace), Scikit-learn, NLTK, OpenAI GPT, Streamlit.

3D VR-Draw (Summer Project) **May 2024**

- Developed a Unity app that runs on Meta Quest VR headsets. Users can move in a virtual 1:1 setup of the HCI lab at MUN and draw on the surfaces using simple hand gestures like pinch/point.
- Built a building-block system that facilitates data collection, testing, and experimentation, streamlining the process and reducing setup time by 80% for future research projects and papers.
- Tech Stack: Unity, C#, Meta SDK, Git.

MUN Ask_Bot (Personal Project) **Dec 2022**

- Designed and developed a web app which answers all questions related to course program information. It is trained on the university calendar, uses OpenAI's API endpoints like ChatGPT.
- The model answered with 90% accuracy in 3 seconds reducing student search time significantly.
- Implemented Retrieval Augmented Generation (RAG) for response relevance before it was widespread knowledge.
- Tech Stack: React, Python, TypeScript, Tailwind CSS, Flask, OpenAI API.

EPFO Fetch API (Personal Project) **Nov 2022**

- Developed a script to fetch data bypassing CAPTCHA of a government website to help a startup download public data, including over 100,000 companies. Responsibly reported the vulnerability to authorities.
- Boosted their data reporting project timeline to under 2 months and reducing manual work by 95%.
- Tech Stack: Python, py-Pandas, Postman API.

Collection of AI and Computer Vision projects (Group Project) **Sep 2022**

- Built efficient path finding algorithms to solve mazes; developed genetic algorithm to solve Sudoku; built Connect 4 game artificial algorithm using alpha-beta pruning and minimax algorithm.
- Developed image processing filters, convolution filters, image quality boosters and compressors.
- Tech Stack: Java, Python, OpenCV, TKinter, Pandas, Swing, Numpy.

Non Technical Projects

Marketing Research Report (Team Collaboration) **Jan 2024**

- Wrote a 70+ page document on market research about a food product, detailed report on macro/micro environment analysis, SWOT analysis, market segmentation/justification, positioning, development and financial reports for a class under Dr. Kirby Shannahan.

Non Technical Experience

Party Host (Part Time) **Nov 2021 – June 2022**
Get Air Trampoline Park

- Hosted and supervised children's parties for groups of up to 30, ensuring safety, entertainment, and fun while engaging with both kids and parents in the park on trampolines.