

# Shanav Bagga

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## EDUCATION

### University of Illinois at Urbana-Champaign

Bachelor's of Science in Computer Science and Statistics

Champaign, IL

Expected Graduation: May 2026

- **GPA:** 3.71 / 4.00
- **Relevant Courses:** Data Science Discovery, Discrete Structures, Data Structures, Computer Architecture, System Programming, Linear Algebra, Algorithms, Databases, Machine Learning

## PROFESSIONAL EXPERIENCE

### Arora Innoventions

Remote

Software Engineer Intern

June 2024 - Present

- Fine-tuned a Stable Diffusion and Control Net model on 1000 image pairs for 5 epochs, optimizing hyperparameters to achieve a 60% improvement in output image quality for avatar creation
- Implemented an API endpoint for the model through Node.js and Express.js and deployed it onto a Google Compute Engine GPU instance, resulting in a 40% reduction in image processing time
- Engineered a full-stack landing website through React.js, Node.js, Express.js, and Firestore that allows for users to pre-register for services and learn about our mission

### Department of Computer Science

Champaign, IL

Undergraduate Teaching Assistant

August 2023 - December 2023

- Held weekly office hours assisting 50+ students understanding key C++ concept such as compilation, stacks, dynamic memory, queues, trees, graph theory, smart pointers, polymorphism, and file streams
- Led 14 lab sessions which enhanced student comprehension and project readiness through coding exercises

### AI Camp

Remote

Software Engineer Intern

May 2023 - August 2023

- Developed a Python chatbot hosted with Streamlit which allows users to select from 3 different query engines and upload up to 10 files simultaneously, enabling comprehensive search capabilities
- Implemented 3 distinct RAG pipelines through a variety of Llama Index, Langchain, Pandas, Pinecone, and OpenAI's API to optimize performance for various different tasks that the user desires
- Developed an automated testing suite by generating 1,000 queries using OpenAI's API and the SQUAD dataset and reduced the hallucination rate to 5%, significantly enhancing the chatbot's reliability
- Strengthened performance and reached a 90% median response accuracy score by integrating the Llama Index and Pinecone pipeline, which successfully decreased the total incorrect responses by 25%

## EXTRACURRICULAR EXPERIENCE

### Project: Code

Champaign, IL

Technical Lead

August 2023 - December 2023

- Led a team of 10 students through the development of an interactive Python chatbot where students are able to upload PDFs of course textbooks and query them to assist them in studying
- Incorporated Agile methodologies in weekly meetings to provide students with knowledge of APIs, RAG pipelines, and version control, resulting in a 30% improvement in overall team efficiency

## PROJECTS

### Customer ETL Pipeline | Python, MySQL, Spark, Google BigQuery

May 2024

- Implemented an ETL Pipeline that extracted 250,000 records of ecommerce customer data from MySQL
- Transformed the data in PySpark through filtering out 5,000 rows containing null values, grouping all unique customers together, engineering a purchases feature, and loaded it to Google BigQuery
- Engineered a logistic regression model to predict customer retainment, achieving an accuracy rate of 75%

### GPT Lyric Generator | Python, HTML, CSS, Javascript, Flask

July 2023

- Utilized GPT-2 embeddings and the GPT-Neo model from Hugging Face to implement a full-stack website that randomly generates lyrics in the same style as Taylor Swift and deployed it onto Heroku
- Deployed the model with a loss of 0.138 to Hugging Face and fine-tuned the output of API calls by adjusting hyperparameters, resulting in a 20% increase in cohesive and accurate lyrics

## TECHNICAL SKILLS

**Languages:** C/C++, Python, Java, Typescript, Javascript, Rust, SQL, R, HTML, CSS

**Developer Tools:** Git, Docker, AWS, Linux, Google Cloud, MySQL, MongoDB, Firestore

**Frameworks:** React.js, Flask, Spark, Node.js, Express.js, Tensorflow, Scikit-Learn