Ayush Singh

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EDUCATION

University of Illinois Urbana-Champaign — Champaign, IL
B.S. in Computer Science + Linguistics, Minor in South Asian Studies — *May 2027*
GPA: 3.85/4.00

Relevant Coursework: Data Structures, Discrete Structures, Computer Architecture, System Programming, Statistics and Probability, Introduction to Algorithms and Models of Computation

EXPERIENCE

Research Assistant — September 2024 – January 2025
University of Illinois Urbana-Champaign — *Champaign, IL*

- Working with Dr. Halil Kilicoglu to use BERT in order to classify medical journal entries on PubMed by publication type based on the abstract, title, full text of paper, and the author's previous publication history
- Utilized Bio.entrez library to gather articles from PubMed and used Pandas and NumPy in order to analyze publication patterns and visualize how new publication types are used in medical research
- Explored using other LLMs such as Specter2 and BERT in order to increase performance and flexibility

Software Engineering Intern — June 2024 – August 2024
Knack Systems — *Woodbridge, NJ*

- Designed and implemented a machine learning model to predict damage risk in warehouse operations by analyzing historical picking data, item fragility scores, and previous handling incidents.
- Trained and optimized a Random Forest Classifier, achieving high accuracy in identifying high-risk picking routes and reducing potential damage through predictive analytics and automated decision-making.
- Developed and deployed the model as a Flask API, integrating it with SAP EWM to dynamically recommend safer pick paths, assign experienced warehouse staff, and enhance operational efficiency.

PROJECTS

Full-Stack NBA Player Ranking Web Application | *Python, Django, PostgreSQL, Firebase* — 2025

- Engineered a scalable full-stack web platform leveraging Django REST Framework (DRF) and Next.js, implementing PostgreSQL for persistent ranking storage and Redis for optimized leaderboard caching.
- Integrated OAuth 2.0 authentication via Firebase Auth, enabling secure third-party login (Google, Twitter) and implemented Twitter API for automated ranking posts.
- Designed and optimized leaderboard aggregation queries using PostgreSQL's window functions and indexing, efficiently computing rolling averages for rankings over two-week and full-season periods.

ChessVision | *Python, OpenCV, PyTorch, Stockfish API, Android Studio* — 2025

- Developed a mobile app that utilizes computer vision and AI to recognize chess board positions from images and analyze them in real time.
- Implemented OpenCV for image processing, YOLO for piece detection, and Stockfish for move evaluation, enabling deep tactical and positional insights.
- Optimized the image recognition pipeline to achieve over 95% accuracy in board detection, reducing processing time to under two seconds per analysis.

HeartML | *Python, JavaScript, Django, MySQL, Pandas* — 2024

- Developed a logistic regression model that predicts heart disease with 91% accuracy using dataset of 310k entries
- Built end-to-end website with simple UI for elderly patients using Django, Python, Javascript, and Bootstrap3
- Incorporated goal management and personal information storage using MySQL database queries with permission checks

TECHNICAL SKILLS

Languages: Java, Python, C/C++, JavaScript, HTML/CSS, C#, SQL, R
Frameworks: React, Node.js, Flask, TensorFlow, PyTorch, Pandas, NumPy, FastAPI, Django, PostgreSQL
Developer Tools: Git/Github, VS Code, Visual Studio, Android Studio, Unity, Tableau, Firebase