Kushal Patel

Ann Arbor, MI 48103
734-406-4636 patelku@umich.edu kushal5294.github.io

Education

University of Michigan — **Ann Arbor, MI**
MS in Computer Science — *Expected May 2026*
BS in Computer Science, GPA: 3.8 — *May 2025*

- **Relevant Coursework:** Advanced Scalable Systems, Distributed Systems, Web Systems, Machine Learning, Database Management Systems, Advanced Compilers, Foundations of Artificial Intelligence, Discrete Math, Computer Organization, Data Structures and Algorithms, Theory of Computation

Experience

Amazon — **May 2025 – Aug 2025**
Software Development Engineer Intern — *Bellevue, WA*

- Accelerated RGB-D camera calibration by **600%** by building a **C++** pipeline that automatically computes 4×4 transformation matrices for adjacent devices via RANSAC floor plane detection and ICP/edge-refined PCD stitching.
- Designed a **10,000 TPS** backend service using **AWS Lambda** for compute and **DynamoDB** for persistence.
- Achieved **100%** security by leveraging **Midway** user context & authorizing warehouse privileges at **API Gateway**.

University of Michigan, ITS — **Jan 2024 – Apr 2024 & Aug 2024 – Dec 2024**
Software Engineer Co-op — *Ann Arbor, MI*

- Improved image publishing pipeline by **66%** for **50+** UM web developers by building **3** plugins that automatically generate alt text via **generative AI** from Azure OpenAI Service & OpenAI GPT-4o LLM.
- Released open source **Google add-on**, **Drupal module**, & **WP plugin**: https://kushal5294.github.io/auto_alt.html.

Next Play Games — **May 2024 – Aug 2024**
Software Engineer Intern — *Los Angeles, CA*

- Launched a fantasy baseball app by syncing MLB data for **2,087** players into a **PostgreSQL** database hosted on **AWS**.
- Built **8** REST API endpoints using **Express.js** and **Redis** to efficiently serve live stats, projections, and news to users.
- Ensured **100%** app reliability by writing automated tests via **Jest** to validate daily box scores and player stats.

Infinite Degrees — **Aug 2022 – Dec 2022**
Machine Learning Intern — *Ann Arbor, MI*

- Quantified a snowboarder's skill by devising an **ANN** model via **TensorFlow** to weigh **398** tricks on difficulty.
- Assigned snowboarding skill rating to **87** active users by applying the ML model on user's uploaded tricks and data.

Projects

NFL Spread Predictor | *Python, HTML, CSS*

- Engineered a **Pandas** data frame of **304** metrics for all NFL games from past **7** years by web scraping with **Selenium**.
- Predicted score differential of future games by building a **DNN** via **TensorFlow** library & data frame.
- Accomplished **61%** win rate and finished **+37 units** against DraftKings spread across **181** NFL games.
- Shared weekly picks by scripting a static site generator (**Jinja2**): https://kushal5294.github.io/nfl_spread.html.

Sharded KVStore | *Go*

- Achieved **100%** linearizable consistency by running multi-instance **Paxos** across replicas to decide each log index.
- Enabled **horizontal scaling** by sharding keys into **16** groups & re-balancing server load via a centralized shardmaster.
- Ensured **fault tolerance** under replica crashes and network unreliability via RSM replay & duplicate RPC detection.

Search Engine | *Python, JavaScript, CSS*

- Built **inverted index** of **2,936** Wikipedia pages by running tf-idf algorithm through **MapReduce** pipeline.
- Delivered top **10** page hits by creating **Flask** REST API to consult inverted index & PageRank score.
- Constructed frontend UI & deployed to **AWS EC2**: https://kushal5294.github.io/search_engine.html.

Skills

Languages: C++, Python, Go, Java, C, JavaScript, Typescript, HTML/CSS, SQL, PHP, Bash
Technologies: Hadoop, Docker, MySQL, MongoDB, NoSQL, Postman, DataGrip
Concepts: Computer Vision, OOP, Agile, Neural Networks, Unit Testing, Full Stack, End-to-End, Parallel Processing