

# Prateek Kumar Goel

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## WORK EXPERIENCE

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### Machine Learning Researcher

Jul 2023–Present

University of Florida (IFAS Lab)

Gainesville, FL

- Achieved a 15% reduction in resource utilization costs through custom transformer architecture, integrating autoregression for precise adaptation to seasonal time series data using PyTorch.
- Accomplished 12% improvement in stitching accuracy while automating multispectral drone imagery conversion into high quality actionable geospatial data for AI-driven Precision Agriculture.
- Attained 98% accuracy in overall data quality by implementing a streamlined workflow for stitching, projection, georeferencing, labeling and zonal statistics.
- Generated 4.5+ million synthetic datasets across 10,560 scenarios using Python to enhance Agro-ML models.

### Graduate Research Assistant

Oct 2022–May 2023

University of Florida (IFAS Lab)

Gainesville, FL

- Performed data preprocessing for plant growth and biomass prediction using Pandas for LSTM model training.
- Reduced calibration time by 150 days for DSSAT model, by optimizing Python code implementing parallelism.
- Enhanced crop models for 6 farms over 8 years accurately simulating annual soil nitrogen and plant growth data.

### Teaching Assistant - Programming with C++

Aug2022–Dec 2022

University of Florida (CISE Department)

Gainesville, FL

- Spearheaded a series of lectures on advanced programming concepts such as Lambda Functions, Design Patterns, and Debugging, effectively educating a class of 330 students.
- Conducted weekly office hours and doubt sessions to reinforce core programming concepts.
- Assisted in developing and grading assignments, quizzes, and exams, with feedback to support student learning.

### Software Engineer & Cofounder

Feb 2019–Jul 2021

YVO Service Private Limited

New Delhi, India

- Achieved seamless user experience with 100 QPS load capacity by spearheading the development and launch of a two-wheel motor service booking system, in collaboration with a five-member cross-functional team.
- Attained 99.5% uptime by engineering and deploying a high-availability NodeJS REST API on Azure, using Docker and integrating SQL and WebSocket technologies for effective real-time data exchange.
- Crafted a user-friendly frontend application for a motor-bike service platform utilizing NodeJs, React, and Tailwind CSS, enhancing customer engagement and service accessibility.
- Amplified transaction rates by 60% through a data-driven UX redesign, capitalizing on user interaction analytics to optimize and streamline the customer journey.
- Innovated a BLE-enabled vehicle health monitoring prototype with 94% accuracy in predicting maintenance needs, leveraging a centralized federated learning model, thereby enhancing vehicle reliability and customer trust.
- Managed and mentored a team of five engineers through numerous sprint plannings, facilitating their career advancement and skill development.

## TECHNOLOGIES AND LANGUAGES

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- Languages: C++, Python, SQL, Java, HTML/CSS, JavaScript, TypeScript, MongoDB
- Framework: React, Flask, Qt, Spring Boot, NodeJS (MERN), Angular
- Data Science: SQL, NoSQL, Pandas, Cuda, Numpy, PyTorch, LSTM, LLMs
- Others: Git, Docker, CI/CD, AWS, Azure, GCP TDD, Kubernetes, Kafka

## EDUCATION

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**University of Florida**  
MS, Computer Science

**Aug 2021–May 2023**  
Gainesville, FL

- Relevant Coursework: Software Engineering, Advanced Data Structures, Algorithms, Distributed Systems, Engineering Project Management, Human-Computer Interaction, Applied Machine Learning

**BML Munjal University**  
BTech, Computer Science

**Sep 2014–May 2018**  
Gurugram, India

## PROJECTS

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**Full Stack UrbanClap Clone:** Angular, Golang, SQL, GitHub Actions

- Led a team of 4 people in the development of a full-stack UrbanClap clone, following best practices for software engineering using agile methodology.
- Worked on user stories, requirements, backend, frontend, E2E tests, unit tests, and API documentation.

**Covid-19 Food Relief ERP System:** Vue.js, SQL, HTML, CSS, AWS

- Architected and deployed a web-based ERP system for the State Government and ~20 NGOs, streamlining food distribution during the Covid lockdown.
- Engineered and scaled REST APIs and cloud infrastructure to efficiently manage geo-demographic data for 6.5 million users.
- Optimized resource routing algorithms, saving 340,000 lives by ensuring timely food assistance during a critical period.

**Distributed Systems' Projects:** Akka.Net, F#, SQL, JavaScript, WebSockets

- Pioneered the implementation of the Gossip Protocol and conducted a comprehensive study on information dissemination rates across diverse topologies, such as 2D and 3D.
- Developed a highly scalable peer-to-peer lookup service by leveraging the Chord Protocol with rigorous performance analysis, ensuring optimal functionality, high performance, and reliability, contributing to the overall success of the project.
- Conceptualized and built a Twitter engine using the Akka.net actor model in F#, incorporating features like tweet, retweet, and follow. Managed concurrent users and real-time updates using WebSockets, and successfully profiled and stress-tested the system with 100K users executing a million tasks each, simulated over just 5 machines.

## PUBLICATIONS & CERTIFICATIONS

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- An effort to couple DSSAT model with machine learning models to predict soil mineral nitrogen in potato fields [ASABE - Annual International Meeting 2023] *Accepted*