# Ishaan Goel

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## Summary

Math and AI researcher and developer specializing in ML and NLP, with demonstrated success in designing a scalable RAG-based system for enterprise applications. Experience applying generative models. Globally adaptable, multilingual and aiming to pioneer generative AI solutions in NLP and/or finance applications.

## Education

**Illinois Institute of Technology** (3.73/4.00) — Chicago, IL

Dual B.S. Applied Mathematics and Data Science — Aug 2022 – Present

Minor in Finance

*Recipient of the Heald and STEM+ Scholarships*

M.A.S. Artificial Intelligence — Aug 2024 – Present

## Relevant Coursework

**Math:** Probability, Linear Optimization, Intro to Stochastic Processes, Graph Theory, Monte Carlo Methods in Finance

**CS:** Machine Learning, AI Language Understanding, Data Mining, Data Preparation and Analysis

**Other:** Language Theory in NLP, Deep Technology Commercialization

**Enrolled:** Information Retrieval, Deep Learning

## Experience

**Intern** — Jul 2024

PeopleStrong Technologies Ltd. — Remote

- Developed a chatbot for employee query management using Retrieval Augmented Generation (RAG) architectures and Large Language Models (LLMs). The chatbot is intended to serve 1,000+ employees.

**Research Assistant** — Aug 2024 – Present

Illinois Institute of Technology, Department of Applied Mathematics — Chicago, IL

*Under Dr. Igor Cialenco, NSF-funded research*

- Developing a stochastic mathematical framework to address sustainable groundwater management, focusing on equitable water allocation and dynamic market regulations under California's SGMA.

**Research Assistant** — Aug 2024 – Present

Illinois Institute of Technology, Department of Applied Mathematics — Chicago, IL

*Under Dr. Igor Cialenco, NSF-funded research*

- Developing a stochastic mathematical framework to address sustainable groundwater management, focusing on equitable water allocation and dynamic market regulations under California's SGMA.
- Applying concepts from stochastic games and Nash equilibria to model groundwater rights pricing, assess policy impacts, and support scalable, adaptable solutions for global water markets.
- Collaborating on interdisciplinary research by integrating mathematical theory with hydrological and economic data, while designing computational algorithms for multi-stakeholder equilibrium analysis.

**Intern** — Jul 2024

PeopleStrong Technologies Ltd. — Gurugram, India

- Developed a chatbot for employee query management using Retrieval Augmented Generation (RAG) architectures and Large Language Models (LLMs). The chatbot is intended to serve 1,000+ employees.
- Key accomplishments include designing an agentic chatbot architecture that integrates 5+ RAG systems, conducting A/B testing to evaluate RAG feasibility, researching LLM response evaluation, fine-tuning AI assistants, and employing prompt engineering for high-quality responses. Presented findings to company leadership, resulting in planned company-wide deployment.

## Projects

**AI Language Understanding Projects** | *NLP, Python* — Aug 2024 – Dec 2024

- Developed models in Python including a Probabilistic Language Model, a Naïve Bayes Classifier and a KNN Classifier.

## Skills

**Programming & Markup:** Python, R, Julia, Java, Mathematica, MATLAB, LaTeX, HTML, CSS, SQL

**Python Stack:** PyTorch, NumPy, pandas, Matplotlib, SciPy, scikit-learn, Streamlit

**R Stack:** tidyverse, caret, rpart, glmnet, e1071, keras

**Spoken Languages:** English, Hindi-Urdu, Mandarin Chinese, Spanish, Modern Standard Arabic