Ishaan Goel

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Summary

Mathematics researcher and AI developer with deep quantitative foundations. Seeking to apply expertise in generative AI and stochastic modeling to solve complex problems in Natural Language Processing and Quantitative Finance.

Education

Illinois Institute of Technology (3.6/4.0)   Aug 2022 – Present
M.A.S. Artificial Intelligence
Dual B.S. Applied Mathematics and Data Science, Finance Minor
  Specializations in Discrete Math, Stochastics, Mathematical Finance
    Heald and STEM+ Scholarships Recipient

Relevant Coursework

Math: Probability, Linear Optimization, Stochastic Processes, Graph Theory, Monte Carlo Methods in Finance, SPDEs, Real Analysis, Abstract Algebra, Combinatorics, Dynamical Systems, Functional Analysis (audit)

AI/ML: Machine Learning, Statistical Learning, Natural Language Processing, Artificial Intelligence, Data Mining, Deep Learning, Information Retrieval, Algorithms, Database Organization, Game Theory (audit)

Finance: Economics of Capital Investments, Principles of Economics, Accounting

Planned (Spring 2026): Big Data Technologies, Advanced AI, Quantitative Risk Management, Financial Derivatives

Experience

Illinois Institute of Technology, Department of Applied Mathematics   Chicago, IL
Research Assistant under Dr. Igor Cialenco, NSF-funded research   Aug 2024 – Present
  Applying concepts from RL, stochastic (optimal) control, and game theory to model groundwater rights distribution and assess policy impacts for water markets by integrating mathematical theory with hydrological and economic data.
Research Assistant under Dr. Michael Pelsmajer   May 2025 – Present
  Making a Markov Chain sampler in Python to generate uniform random hypergraphs with the same k-core sequences.

PeopleStrong Technologies Ltd.   Gurugram, India
Intern   Jun 2025 – Jul 2025
  Built a scalable RAG-based system for Automated Ticket Resolution, enabling document-grounded Q&A for 1,000+ employees and reducing index testing time by over 200x (weeks to hours). Gained hands-on experience in deploying production-ready agentic AI systems and accelerating iteration cycles through automation and containerization.
Intern   Jul 2024 – Jul 2024
  Designed and deployed a scalable LLM-based chatbot with an agentic architecture integrating 5 RAG systems, validated via A/B testing and approved for company-wide rollout.

Skills

Programming: Python, R, Julia, C++, Java, LaTeX, HTML, CSS, SQL, Mathematica, MATLAB

Python Stack: PyTorch, scikit-learn, NumPy, pandas, matplotlib, NetworkX, PySpark

R Stack: tidyverse, data.table, glmnet, boot, gam, keras, caret, e1071, rpart, foreach, dbscan, pROC, Matrix, pls, class

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

Others: Generative AI, Mathematical Finance, Operations Research, Stochastic Modeling, Discrete Mathematics

Projects

Full-Stack Information Retrieval Engine | *IR, scikit-learn, Flask, Scrapy, Python*   Oct 2025 – Present
  Developing a full-stack information retrieval engine featuring a Scrapy crawler with configurable depth and AutoThrottle, a TF–IDF inverted index with cosine similarity and optional semantic kNN search (word2vec, FAISS), and a Flask-based query processor with Top-K ranking, NLTK spell correction, WordNet expansion, and CSV export.

mathcode | *PyPi, Python, NumPy, NetworkX*   Jun 2025 – Present
  Actively developing a Python library implementing mathematical algorithms from coursework: graph algorithms, stochastic processes (Brownian motion, Markov chains, SDEs/SPDEs), optimization (gradient descent variants, simplex), abstract algebra, and reinforcement learning (value/policy iteration, Monte Carlo methods).

Distributed RL for Plastic Drift Simulation | *RL, PyTorch, JAX, Python*   Aug 2025 – Nov 2025
  Developed a distributed Monte Carlo RL framework that simulates ocean plastic drift and aggregates results from volunteer clients for large-scale model optimization, earning 3rd place in the Grainger Computing Innovation Prize.