

# Anuj Nagpal

Linkedin: [linkedin.com/in/anujnag/](https://www.linkedin.com/in/anujnag/)

Github: [github.com/anujnag](https://github.com/anujnag)

Email : [anujnagpal96@gmail.com](mailto:anujnagpal96@gmail.com)

Website : [anujnag.github.io](https://anujnag.github.io)

Mobile : +1-650-441-6529

## EDUCATION

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- **Stanford University** California, U.S.A.  
*Masters in Computational and Mathematical Engineering; GPA: 4.1/4.0* *Sep 2021 - Ongoing*
- **Indian Institute of Technology Kanpur** Uttar Pradesh, India  
*Bachelors in Computer Science and Engineering; GPA: 9.3/10.0* *July 2014 - May 2018*

## WORK EXPERIENCE

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- **Facebook** Menlo Park, California  
*Machine Learning Engineering Intern - Marketplace Product Intelligence (MPI)* *June 2022 - September 2022*
  - **Product Intelligence:** Worked on a **multimodal framework (MMF)** for extracting product attributes from images and text in marketplace listings for use in search, ranking, and recommendation.
  - **Machine Learning Pipeline:** Designed the complete **machine learning workflow** that automated every step of the pipeline, from the first process of training data preparation to the final step of model evaluation.
  - **End-to-End Training:** Achieved **90%+ accuracy** with a hierarchical vision transformer based image encoder trained end-to-end with a multi-head product attribute and category classification network.
- **Goldman Sachs** Bengaluru, India  
*Associate - Fixed Income Currencies and Commodities (FICC)* *June 2018 - July 2021*
  - **Systematic Market Making:** Worked as an **algorithmic market-making developer** with a focus on electronic and automated trading of fixed-income products.
  - **Automated Trading:** Developed and supported applications that **stream algorithmic prices** to electronic trading platforms as well as **automatically quote** a subset of the incoming trade inquiries using live market data, product attributes, and manual trader inputs.
  - **Scalable Architecture:** Built robust and scalable systems that can handle **heavy inquiry load and rapid market movements** for trading desks based in New York, London, and Hong Kong.
  - **E-Trading Expansion:** Enabled **electronic trading support** for new fixed income securities including custom credit default swaps and money market products. Also expanded **e-trading communication streams** with new exchanges and clients that increased revenue.

## ACADEMIC PROJECTS

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- **Natural Language Generation with Inverse Q-Learning:** (won the best project award) [Project Link](#)  
Designed and built an **adversarial-free imitation learning approach** for natural language generation that gives lower text perplexity than maximum likelihood based models. Won the best project award.
- **Knowledge Graph Completion with Graph Neural Networks:** [Project Link](#)  
Implemented **graph neural network (GNNs)** models including **TransE, ComplEx and RotatE** for triple prediction in knowledge graphs and evaluated them on Hits@K, Mean Rank (MR) and Mean Reciprocal Rank (MRR) metrics.
- **Instance-Specific Augmenter with Representation Matching:** [Project Link](#)  
Designed an end-to-end learnable **instance-specific augmentation module** based on representation matching that can improve meta-learning task performance in a few-shot setting.
- **Diffusion Modeling with Multi Sample Denoiser:** [Project Link](#)  
Developed a **denoising autoencoder** based approach for **score value estimation** that can be scaled to multiple noisy samples for faster training and better image generation quality in diffusion models.
- **Neural Models for Granger Causality Detection:** [Project Link](#)  
Implemented a class of neural network based **non-linear models for Granger causality detection** which are capable of capturing long term dependencies between various time series.

## TEACHING ASSISTANT EXPERIENCE

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- **CS224N:** Natural Language Processing with Deep Learning, Stanford University, Winter 2023
- **CME100:** Vector Calculus for Engineers, Stanford University, Fall 2022 and Spring 2023
- **CME323:** Distributed Algorithms and Optimization, Stanford University, Spring 2022
- **CS236G:** Generative Adversarial Networks, Stanford University, Winter 2022
- **ESC101:** Fundamentals of Computing, IIT Kanpur, Winter 2018

## TECHNICAL SKILLS

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- **Languages:** Python, C++, Java, R, Scala, JavaScript, SQL, Bash, HTML/CSS
- **Libraries:** PyTorch, TensorFlow, Keras, PyG, JAX, CVXPY, PySpark, Numpy