Anugrah Vaishnav

Lowell, MA vaishnav.anugrah123@gmail.com linkedin.com/in/anugrah-vaishnav/ github.com/prototypeanugrah

Available to start: May '25

EDUCATION

University of Massachusetts Lowell, Lowell, MA Sep '23 - Expected May '25
M.S. in Computer Science *GPA - 3.85/4*

Ramaiah Institute of Technology, India Aug '17 - May '21
B.E in Electronics Engineering *GPA - 8.3/10*

TECHNICAL SKILLS

Languages Python, R, SQL
Tools Pandas, NumPy, PyTorch, Keras, TensorFlow, Scikit-Learn, Jupyter, PySpark, OpenCV, Docker
Data Science Supervised Learning, Unsupervised Learning, Semi-Supervised Learning, Deep Learning, Graph Neural Networks (GNN), Computer Vision, Generative-AI, Natural Language Processing (NLP), Fine-tuning (LoRA, PEFT) Large Language/Vision Models (LLM/LVM)

PROFESSIONAL EXPERIENCE

Data Scientist | *Portcast (India)* Aug '22 - May '23
- Performed Root Cause Analysis (RCA) of maritime vessel delays and inefficiencies in report generation.
- Automated report generation (Python, SQL), saving 10+ hours of weekly manual work.
- Utilized data viz tools (Tableau, Superset) to create interactive dashboards, present findings to the clients.

Data Scientist | *Equipped Analytical Intelligence (India)* Nov '21 - Aug '22
- Automated report generation for 8 stakeholders (R, SQL), saving 10+ hours of monthly manual work.
- Migrated existing data viz source code from legacy version to modern tech stack, 30% increase in efficiency.
- Utilized data viz tool (R-Shiny) to create interactive dashboards, present findings to the clients.

RESEARCH EXPERIENCE

3D Endoscopy Procedure Reconstruction for VR *(WIP)* | *Advisor: Dr. Yu Cao* Sep '24 - Present
- Developing 3D models of endoscopy procedures using Monocular Depth Estimation (MDE) techniques with Depth Anything V2 on endoscopy video data.
- Creating immersive medical procedure simulations compatible with VR headsets for training and education.
- Evaluating using Intersection over Union (IoU), RMSE, AbsRel errors to assess depth accuracy and reconstruction quality.

Research Assistant: Biomedical Data Science | *Advisor: Dr. Rachel Melamed* Sep '23 - May '24
- Led research on the impact of antidepressants on COVID-19 severity using causal inference techniques.
- Implemented machine learning algorithms (S/T learners, TARNet, GNN, VAE) using PyTorch to predict Individual Treatment Effect (ITE) from Electronic Health Records (EHR) data.
- Found that use of antidepressants may be linked to reduced death risk in patients hospitalized with COVID-19.

Elevating Image Captioning via CoT Conditioning | *Dr. Yu Cao* | *https://sor.bz/B1qTf* Jan '24 - May '24
- Analyzed image captioning models by comparing performance with and without chain of thought conditioning.
- Established benchmarking system using human, LLaVa, and CLIP evaluations to compare captioning models.
- Revealed chain-of-thought conditioning significantly enhances caption quality (BLEU score), showcasing its potential to improve AI's understanding of visual content.

Retrieval-Based Chest X-ray Report Generation | *https://sor.bz/PpWNd* Jan '24 - May '24
- Implemented retrieval-based model for generating chest X-ray reports using CLIP, focused on clinical accuracy.
- Fine-tuned the CLIP model on MIMIC-CXR (EHR) train subset; generated report labels using CheXbert.
- Evaluated model effectiveness: BLEU (0.073) - 7% improved over SOTA, F1-score (0.274) - similar to SOTA.

Correlated Topic Models: PyTorch Implementation | *https://sor.bz/ZbrNF* Sep '23 - Dec '23
- Built an open-source implementation of CTMs using Automatic Differentiation Variational Inference (ADVI).
- Enabled batched training and ADVI to scale efficiently across large datasets in PyTorch.
- Achieved 10-15% faster processing times and 8-10% better accuracy for large batch sizes, outperforming popular libraries such as tomotopy, PyCTM, and topicmodels (which don't use ADVI).