Chidaksh Ravuru

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Papers: My publications

EDUCATION

University of North Carolina, Chapel Hill Aug, 2024
Master of Science in Computer Science

- **Advisors:** Prof.Snigdha Chaturvedi

Indian Institute of Technology Dharwad 2020 - 2024
Bachelor of Technology (Honours) in Computer Science and Engineering *GPA: 9.24/10*

- **Advisors:** Prof.Prabuchandran K.J. & Prof.Rajshekhar Bhat

PUBLICATIONS

Accepted Papers

KDD-UG Consortium

- Agentic Retrieval-Augmented Generation for Time Series Analysis
  Chidaksh Ravuru*, Sagar Sakhinana, Venkataramana Runkana

DAI & AI2ASE (AAAI workshops)

- Reprogramming Foundational Large Language Models(LLMs) for Enterprise Adoption for Spatio-Temporal Forecasting Applications: Unveiling a New Era in Copilot-Guided Cross-Modal Time Series Representation Learning
  Sagar Sakhinana, **Chidaksh Ravuru***, Sannidhi Geethan, Venkataramana Runkana

Pre-Prints

- RESTORE: Graph Embedding Assessment Through Reconstruction
  Hong Yung Yip,**Chidaksh Ravuru***,Neelabha Banerjee,Shashwat Jha,Amit Sheth,Aman Chadha,Amitava Das

Thesis

Deep Learning on Images and Topic Modelling [Report][CNN][LM]
Guide: Prof. PrabhuChandran K.J, IIT Dharwad

- Developed multiple Convolutional Neural Networks from scratch, attaining noteworthy 99.3% accuracy on CIFAR10 and a notable 54% accuracy on TinyImageNet on the ResNet architecture.
- Employed various data augmentation and domain generalization techniques to improve accuracy and enhance diversity in the training data.
- Designed Recurrent Neural Networks, Long Short-Term Memory networks , and Gated Recurrent Units for tasks such as Character-Level Language Modeling, Sentiment Analysis of sentences, achieving a remarkable 90% accuracy, and implementing French to English language translation models.

PROJECTS

Question Answering [Report]

- Developed a two step retriever and reader configuratiion for Question Answering. Used Facebook's DPR for passage retrieval with an F1-score of 0.88 and Roberta for extracting the text from context received from the retriever.
- Utilized techniques such as Synthetic Data Generation and Question Similarity Matching to decrease the inference time of the queries.

Underwater communication using Deep Learning [Report][Code]
Guide: Prof.Rajshekhar Bhatt, IIT Dharwad *Aug '22 - Dec '22*

- Developed an autoencoder framework for end-to-end communication encompassing intermediate noise channels, including Gaussian Noise and fading channels.Utilized **Simultaneous Perturbation Stochastic Approximation (SPSA)** method to compute gradients when the channel exhibits non-differentiability.

- ◇ Conducted a comprehensive analysis comparing the final convergence point and the convergence time between **SPSA** and **Gradient Descent** optimization techniques.

Gibbs Sampling [Report][Code]
Guide: Prof. PrabhuChandran K.J, IIT Dharwad *Jan '22 - April '22*

- ◇ Solved System of Linear Equations using **Conjugate Gradient** where the search directions are sampled using Gibbs Sampling. With this algorithm we were able to arrive at the final solution set **faster than** using traditional **steepest descent** but we were slower than conjugate gradient.
- ◇ Compared the effect of **Collapsed Gibbs Sampler** with Normal Gibbs Sampler in **Topic Modelling using Latent Dirichlet Allocation (LDA)**.

EXPERIENCE

Student Research Intern at Indian Institute of Technology, Delhi (IIT D) Jan '24 - May '24
Guide: Prof.Chetan Arora *Delhi*

- ◇ Surveyed state-of-the-art face recognition models applied to surveillance videos. Identified limitations in existing models, especially in law enforcement scenarios, and proposed areas for future research under Prof. Chetan Arora.
- ◇ Benchmarked a dataset comprising 150+ videos of 50+ subjects with variations in lighting, height and angle

LLMs for Time Series Analysis May '23 - July '23
TCS Research *Bangalore*

- ◇ Investigated the application of Graph Machine Learning and Large Language Models for Time Series tasks, including Time Series Forecasting and Missing Data Imputation.
- ◇ Evaluated the potential of Large Language Models as a Universal Model for various Time Series tasks and Published key findings from this research at KDD-UGC, 2024.

Research Intern at AI Institute of University of South Carolina (AIISC) Jan '23 - Nov '23
Guide: Prof.Amitava Das and Prof.Seth, AIISC *Remote*

- ◇ Researched on evaluating existing Graph Embedding methods for large scale knowledge graphs through Graph reconstruction and published it on arxiv. Suggested new ideas and submitted required ablation studies supporting the ideas for retaining knowledge by merging different graph embeddings efficiently.

SCHOLASTIC ACHIEVEMENTS

- ◇ Selected for **Google Research Week 2024, Bengaluru.**
- ◇ Selected for Machine Learning Summer School (MLSS) 2022 Krakow, Poland. Research Statement
- ◇ Secured **12th place** in Inter IIT Techfest 2023 in AI-ML Problem Statement which was based on **Open-Domain Question Answering**.

TECHNICAL SKILLS

- ◇ **Programming Skills:** C, C++, Python, Java, Bash.
- ◇ **Python Libraries:** numpy, pandas, matplotlib, seaborn, scipy, sklearn, pytorch and tensorflow.
- ◇ **Scripts and Software Skills:** HTML, CSS, Javascript, JQuery, PHP, MySQL, LaTeX, Git, Docker
- ◇ **RESTful API:** LAMP (Linux, Apache, MySQL, Php/python) , Django

POSITIONS OF RESPONSIBILITY

Teaching Assistant Aug '23 - Dec '23

- ◇ Teaching Assistant for Software Systems Lab.
- ◇ Teaching Assistant for Introduction to C and Python Programming courses.

SPACE DATASCIENCE CLUB SECRETARY Dec '21 - Mar '23

- ◇ Lead a team of 30 people in the club, with a vision to make space data easily accessible and available for all so that many machine learning and deep learning techniques can be applied for more insights.

INSTITUTE INNOVATION CLUB Jan '22 - Jan '23

- ◇ Organized talks and workshops for 100+ people and helped the club in managing many events.