Sarang Sridhar

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Education

University of Pennsylvania **2024 - 2026**
M.S.E in Computer and Information Sciences *Philadelphia, PA*
Birla Institute of Technology and Science Pilani **2020 - 2024**
B.E in Computer Science and Engineering *Pilani, India*

Experience

University of Pennsylvania | Research Assistant, Advisor: Prof Kevin Johnson **Aug 2024 – Present**

- Developing a **Large Language Model (LLM) agent** to extract clinically relevant information from audio transcripts of patient-provider conversations; Designing and implementing a comprehensive framework to evaluate various SOTA LLMs' capabilities in summarizing clinical conversations.

University of Pennsylvania | Research Intern, Advisor: Prof Walter Witshcey **Aug 2023 – Jan 2024**

- Developed a **class agnostic few-shot segmentation algorithm** using the **segment anything model (SAM)** to segment the liver from the unlabelled MRI scans of **over 2000 patients**; The algorithm generates point prompts for SAM by analyzing semantic correspondence between unlabeled and labeled images and achieves a **mIoU of 71%**.
- Improved prompt generation by fine-tuning SAM to be more adept at identifying similar features across images.
- Finetuned the Total Segmentator model to segment the heart in CT scans of patients with Lipomatous Metaplasia (fat deposition); **automated the removal of over 80% of noise** and quantification of fat content.

Philips Healthcare | Research Intern **Jun 2023 – Aug 2023**

- Developed inference pipelines for segmentation of lung nodules on Chest CT scans and disease detection on Lung XRays
- Ensured the efficient scheduling of a large number of inference requests by **parallelizing various steps to maximally use GPUs** with Docker and PyTorch in the deployment of the models leading to up to **3x faster performance**.
- Code transferred to servers in Philips Middle East and South Asia and run on over **1.8 million CT scan images**.

Carscan.ai | Web Development Intern **May 2022 – Jul 2022**

- Built a **dashboard** in React and integrated REST APIs through which the product team could quickly update the web app without having to approach any developers; **Reduced 2+ weeks turnaround time** in app updates.

Projects

Sentence Composition Analyzer | Natural Language Processing, U. of Penn **Aug 2024 – Sep 2024**

- Developed a high-performance **Hidden Markov Model**, implementing trigram models with Kneser-Ney smoothing and Viterbi decoding to categorize words based on their roles in sentences, achieving **94% accuracy**; Implemented an **out-of-vocabulary word recognition technique** using suffix trees, achieving a **75%** accuracy rate on unseen words.

Lung Cancer Detection and Segmentation | Link **Aug 2022 – May 2023**

- Worked with Prof Vinay Chamola, BITS Pilani, to apply **transfer learning** in PyTorch to finetune a large pre-trained convolutional neural network on a dataset of CT scans to detect & segment lung cancer nodules.
- Established a strong baseline to automatically identify annotated CT scans (which are usually chosen by radiologists) by experimenting with various **training recipes** and architectures like **vision transformers**; Proposed a **feedback loop mechanism** to improve annotation prediction using downstream cancer detection and achieved **70%** accuracy.

ERPlag Custom Compiler | Link **Feb 2023 – Apr 2023**

- Created a compiler for a custom language (ERPlag) **in C**, with specially designed data structures & algorithms for **optimized memory consumption** & **reduced compile time**; Built the lexer, parser, semantic analyzer, and code generator modules and **reduced generated assembly code size by 25**% through various optimization techniques.

The Studyzone Platform | Link **Oct 2021 – Dec 2021**

- Leveraged Redux and React to develop a student productivity app for **crowdsourcing academic resources**. The app has **3000+ verified documents** and **700+ GB of lecture recordings** to serve students in the university.

The Taxicab Web Dashboard | Link **Jan 2022 – Mar 2022**

- React-based dashboard, integrated with REST APIs for the universities' taxicab service admins to analyze real-time ride statistics and manage rates/packages. This service has **750+ completed trips** and helps **2500+ students**.

Technical Skills

Languages: Python (PyTorch, Tensorflow, Pandas, Numpy, Django), Javascript (Node.js, React.js, Next.js), C, C++, Java
Tools: AWS, Linux, Git, Firebase, Postman, Docker, OpenCV, MONAI

Relevant Coursework

Graduate: Natural Language Processing, Machine Learning, Software Systems
Undergraduate: Deep Learning, Data Structures and Algorithms, Image Processing, Database Systems
Teaching Assistant: Data Structures and Algorithms, BITS Pilani **Aug 2022 – May 2023**