

Subramanya Nagabhushanaradhya

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EDUCATION

My research interest lies at the intersection of natural language processing and computer vision, focusing on developing machine learning techniques that allow computers to understand and use information from multiple sources such as text, images, video, and speech. I aim to advance the state of the art in the commonsense reasoning capabilities of machines.

EDUCATION

University of Massachusetts Amherst, MA
Master of Science in Computer Science Sept 2021 - May 2023
Coursework: Neural Networks, Advanced Natural Language Processing, Intelligent Visual Computing, Mathematical Statistics, Systems for Data Science, Reinforcement Learning

The National Institute of Engineering Mysore, India
Bachelor of Engineering in Computer Science Aug 2015 - May 2019
Coursework: Operating System, Data Structures & Algorithms, Data mining and warehousing

SKILLS

Programming Languages: Python, C++, HTML/CSS, JavaScript, SQL, node.js, Shell Scripting, GLSL
Python: PyTorch, NLTK, scikit-learn, pandas, numpy, scipy, matplotlib, OpenCV, Keras
Others: Git, Linux, three.js, ZMQ, ProtoBufs, flatbuffer, Web Scraping, Unreal Engine, LATEX, Weights & Bias

EXPERIENCE

Human-Centered Robotics Lab, UMass Amherst, MA
Graduate Student Researcher (Advisor: [Prof. Hao Zhang](#)) Sept 2022 - Present

- Experimenting with multi-modal learning approaches based on [DETR](#) and [GLIP](#) to obtain attribute-based representations from natural language descriptions and visual features for object instance recognition and tracking.

Ribbon Communications Westford, MA
Machine Learning Engineer, Intern Sept 2022 - Dec 2022

- Implemented a multi-modal deep learning model for categorizing of user behavior based on VoIP traffic, images, and textual data gathered from user browsing sessions. Worked end-to-end on the project, from data collection to successful deployment.

Vertica Pittsburgh, PA
Software Engineer Intern June 2022 - August 2022

- Worked with Data Optimization and Backup team to develop an algorithm to improve and optimize database re-shading method in Eon mode. Extended this algorithm to improve backtracking of newly created storage containers while performing operations like re-shard, ILM and alter table.
- Designed and developed pipelines for data analytic and machine learning teams to work on backup and restoring information.

Meta Amherst, MA
Graduate Student Researcher (Advisors: [Jay-Yoon Lee](#), [Shane Moon](#), [Andrea Madotto](#)) Jan 2022 - July 2022

- Proposed an advanced cross-modal transformer approach with a video frame-level contrastive loss to reveal the correlation between language queries and video clips, focusing on Natural Language Query tasks for the [Ego4d dataset](#). This approach resulted in an improvement in the baseline with a **IoU 0.5 recall @ 5 of 8.2** and **recall @ 3 of 4.8**

RenderPub Bangalore, India
Head of Product Development Jun 2018 - May 2021

- Lead architect, developer, and designer for [RenderPub Studio](#), [Stitch & Walk](#), architectural visualization softwares.
- Developed Common Unreal Modules (CUM) - a modular C++ / Blueprint system for RenderPub's Unreal Engine based applications. CUM comprises of modules like RenderPub Walk Exporter, Dynamic Sky and weather systems, run time 3D file importer, terrain system with sculpting tools at runtime, Mass Placement, Array Placement and Mesh Painting tools.
- Developed and implemented a 360-degree panoramic image loading algorithm utilizing tile-based streaming, three.js, WebGL, and OpenCV to facilitate seamless transitions between hotspots and accurate 3D projections of images.
- Developed a desktop application utilizing Next.js, Electron, and React to launch and auto-update the RenderPub suite of applications and projects, with features such as authentication, news feeds, accounts, profile settings, and more.

- Yourkraft, a marketplace connecting entertainers and party planners, secured funding from renowned singer Vijay Prakash.
- Managed a network of over 200 artists across multiple cities, including Bangalore, Mumbai, and Hyderabad, and successfully hosted over 350 events.
- Developed a feature-rich dashboard for event planning and artist hiring, including an events list and the ability to book event tickets, utilizing Flask and Firebase technology stack.

Vayam (Non-Profit)

Co-founder/Treasurer

Mysore, India
Jan 2016 - present

- Vayam is a student-led trust with the goal of empowering individuals through education and equality as its foundation.
- In partnership with 5 government schools around Mysore, Vayam provides online classes in subjects such as science, mathematics, and computer science to approximately 200 children.
- In addition to educational efforts, Vayam is committed to giving back to the community and has organized various initiatives, including blood donation drives, charity events, food relief efforts, and green initiatives.

PROJECTS AND RESEARCH

Download Echo360 ([Code](#))

Dec 2022 – Dec 2022

- Developed a command-line Python tool for downloading lecture videos from Echo360 system using course URL, implemented web-driver emulation from Chrome and utilized hls downloader for simultaneous downloading and combining of video parts, then transcoded the videos into mp4 format with ffmpeg for improved organization.

Autofill job forms ([Code](#))

Nov 2022 – Nov 2022

- Developed an open-source Chrome Extension to streamline the job application process, enabling the automatic filling of personal and employment information into job application forms with just a few clicks. The extension features profile creation, local storage on the Chrome browser, compatibility with popular job application platforms like greenhouse.io and lever.co, and ongoing efforts to expand compatibility.

Monocular Depth Estimation on Low Light Images via Transfer Learning ([Code](#) | [Paper](#))

Sept 2021 – Dec 2021

- Proposed a transfer learning approach to estimate depth from low light or monochrome images using a standard encoder-decoder architecture, leveraging features extracted using high-performing classification models such as DenseNet while initializing the encoder. Our approach shows that the model can achieve close to state-of-the-art high-resolution depth maps on the NYU depth dataset even for a simple decoder.

Mental health dialogue system for emotional well-being using deep learning ([Code](#) | [Paper](#))

Sept 2021 – Dec 2021

- Proposed an extended T5-based model with a 2-layer sentiment classifier and an auxiliary loss function during training, to apply sentiment understanding and enforce empathetic response generation. Our approach achieved a perplexity of 13.9 and performed better in emotional appropriateness, relevance and readability than the baseline T5 model fine-tuned on the Empathetic Dialogues dataset

Indoor Panoramic Roaming System ([Code](#))

June 2019 – Dec 2019

- Compared with typical solutions like blending, stretching and parallax-effect methods, this solution provides a natural transition effect, which is very similar to that of a person who sees while walking in 3D space from one view to another. It is designed and developed on three.js.

For other projects and open-source contributions visit github.com/subramanya1997