Subramanya Nagabhushanaradhya

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EDUCATION

My research interests lie broadly in machine learning and its applications to natural language processing and computer vision. I am particularly interested in using information from multiple sources such as text, images, video and speech to improve 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, sckit-learn, pandas, numpy, scipy, mathplotlib, OpenCV, Keras
Others: Git, Linux, three.js, ZMQ, ProtoBufs, flatbuffer, Web Scraping, Unreal Engine, LATEX, Weights & Bias

EXPERIENCE

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

- Experimenting with multi-modal learning approaches based on DETR and GLIP to get attribute-based representations from natural language descriptions and visual features that can be used to recognize object instances.

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

- Working on multi-modal approaches for modeling user behaviour to improve data plans for Mint Mobile.
- Experimenting with LLM's like **RoBERTa** on VoIP traffic, images and textual data gathered from user browsing sessions.

Software Engineer Intern June 2022 - August 2022
Vertica *Westford, MA*

- 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 analytics and machine learning teams to work on backup and restore information.

Graduate Student Researcher Jan 2022 - July 2022
Meta Reality Labs *Amherst, MA*
(Advisors: Jay-Yoon Lee from IESL Lab UMass & Shane Moon, Andrea Madotto from Meta)

- Proposed a cross-modal transformer approach to uncover the correlation between language queries and video clips. This approched was proposed keeping in mind of Natural Language Query tasks for the Ego4d dataset. Our approach improved the baseline to a **IoU 0.5 recall @ 5 - 8.2** and **recall @ 3 - 4.8.**

Head of Product Development Jun 2019 - May 2021
RenderPub *Bangalore, India*

- Core architect, developer, and designer for architectural visualization softwares, RenderPub Studio, Stitch & Walk.
- Developed, designed, and integrated Common Unreal Modules (CUM) - a foundational, modular C++ / Blueprint modules for RenderPub's Unreal Engine 4 based applications. CUM comprises of modules like RenderPub Walk Exporter, Dynamic Sky and weather systems, modular UI, Importer using Assimp, terrain system with sculpting tools at runtime, Mass Placement, Array Placement and Mesh Painting tools at runtime.
- Developed a streaming, tile-based, 360-degree panoramic image loading algorithm to enable a smooth transition between hotspots using three.js and WebGL, along with an OpenCV module to compute projections of images in 3D space.

- Designed and developed a desktop application using next.js, electron and react to launch, auto-updated, bookkeep RenderPub suite of applications and projects with features like auth, news feeds, account, profile settings and more

PROJECTS AND RESEARCH

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, by leveraging features extracted using high performing classification model such as DenseNet while initializing the encoder. Our approach shows that even for a simple decoder, our model can achieve close to state-of-the-art high resolution depth maps on the NYU depth dataset.

Mental health dialogue system for emotional well-being using deep learning (Code | Paper) Sept 2021 – Dec 2021

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