Srinath Naik Ajmeera

srinath@cs.ucla.edu | https://github.com/srinath2022 | +12133576173 | Master's in Computer Science , UCLA

RESEARCH INTERESTS

Machine Learning, Machine Vision, Autonomy & Robotics.

EDUCATION

University of California Los Angeles (UCLA), Los Angeles, CA| Master's in Computer Science - GPA 4.00/4 Expected March 2023

- Graduate Teaching Assistant for COM SCI 31, COM SCI 32 - Introduction to Computer Science I, II (C++)

Indian Institute of Technology Bombay, Mumbai, India| Bachelor's in Computer Science & Engineering - GPA 8.26/10 May 2018

SKILLS

- Software Languages: C++, C, Python, Java, Go, MATLAB
- Frameworks: PyTorch, Tensorflow, OpenCV, scikit-learn, Flask, Android, Node.js, React Native, Ionic
- Web Development: HTML, CSS, Javascript, Markdown

EXPERIENCE

Amazon Summer 2022 | Seattle, Washington

Intern - Amazon One | Palm scan based payments

- Spearheaded the design and development of a crucial Xray module for Amazon One, a state-of-the-art device that utilizes hand scanning technology for user recognition and payment.
- Developed a user-friendly, intuitive transcript summary of all interactions and key events during a user session, enabling faster identification of issues and more efficient root cause analysis.
- Leveraged advanced technologies including Android development, Dagger, and Java, while also managing complex parallel image processing pipelines and working closely with physical hardware (Amazon One) devices.
- Demonstrated strong technical skills, exceptional attention to detail, and a deep understanding of the latest deep learning techniques and computer vision principles, resulting in a highly successful Xray module implementation for Amazon One.

Apple June 2018 - February 2020 | Hyderabad, India

Software Development Engineer - Identity Management Services

- Successfully managed the Registration, Access Management & Provisioning (RAMP) platform, overseeing a set of critical applications responsible for granting and managing access to a wide range of Apple's applications.
- Collaborated closely with business teams to design and implement new features and flows within the RAMP system, ensuring seamless user experience and optimal functionality.
- Demonstrated exceptional technical skills in Java, Spring, Spring-boot, Elastic search, and OracleDB, ensuring the smooth operation and maintenance of the RAMP platform.

RESEARCH PROJECTS

Neural Network Pruning Capstone Project - Present | UCLA

Latest Pruning Techniques, Model Compression, GAN

- Conducted extensive research on state-of-the-art pruning techniques, including magnitude pruning, structured pruning, and iterative pruning, to identify their strengths and weaknesses in various scenarios.
- Implemented and experimented with several pruning algorithms, including L1 regularization, weight decay, and dynamic pruning, to analyze their impact on the performance of deep neural networks.
- Developed a novel Generative Adversarial Network (GAN) based method to automatically learn the distribution of good pruning masks, which enables efficient network compression while maintaining high accuracy.

Visual Counting : Counting currency from video Spring 2022 | UCLA

Deep Learning, Network Pruning, Quantization, Edge Inference

- Developed and implemented a novel approach to count paper bills from video using DeepVision techniques, laying the foundation for automated currency counting.
- Trained a transformer-based network on a self-similarity matrix from video, predicting the period, periodicity of each frame, and the total count of flips in the video.

- Achieved a Mean Absolute Error of 3.95 for the count of flips by creating and meticulously labeling a diverse dataset of around 50 videos of paper flipping, accounting for variations in frequency and lighting conditions.

DeSnowNet : Context-Aware Deep Network for Snow Removal Spring 2022 | UCLA

Computer Vision, Deep Learning, PyTorch

- Designed and implemented a modular neural network for the task of snow removal from images, using large receptive fields based on dilated convolutions to enhance performance.
- Trained the network on the Snow100K dataset, which consists of real images with synthetic snow added, attaining state-of-the-art results.
- Achieved superior performance while using only half the parameters of the original network by training on 20K image pairs, displaying a highly optimized and efficient approach.

Enhancing SLAM in dynamic environments Fall 2021 | UCLA

SLAM, Object Detection, OpenCV, C++

- Developed an innovative algorithm for detecting dynamic objects from video using semantic segmentation with Detectron2, motion vector clustering, and probabilistic pixel-wise motion modeling.
- Integrated the algorithm into ORB-SLAM2, a popular visual simultaneous localization and mapping (SLAM) system, to enable the use of only static keypoints for localization, mapping, and loop closing.
- Improved the robustness of ORB-SLAM2 to dynamic objects in the scene, resulting in more accurate and reliable performance in challenging environments.
- Successfully tested the algorithm on the widely-used TUM and KITTI datasets, exhibiting a deep understanding of computer vision and deep learning principles and their practical applications.

AI powered robot in virtual Icecream Gridworld Fall 2021 | UCLA

Reinforcement Learning, Path Planning, DeepRL

- Designed and developed a high-fidelity simulator for Icecream Gridworld, featuring a robot capable of handling dynamic goal states, rewards, and transition probabilities.
- Implemented and tested advanced algorithms such as Policy Iteration and Value Iteration to calculate the optimal policy for the robot within the simulated environment.
- Utilized cutting-edge techniques including Probabilistic Road Map (PRM) and Rapidly Exploring Random Tree (RRT) algorithms for effective path planning within the Icecream Gridworld simulator.

Smart phone based digitization of printed books Bachelor's Thesis | IIT Bombay

CNN, Audio Spectrograms, OpenCV, Image Processing, OCR

- Developed a limited speech command classifier using Convolutional Neural Networks (CNNs) on spectrograms of one-second long custom commands collected from multiple sources, and integrated the classifier into a mobile application for custom voice capture.
- Pioneered a novel method for automatically extracting single-page images of the left and right portions from captured two-page images of a book, leveraging a pre-trained Neural Network model and a de-curling engine to achieve high-quality, flat pages for improved Optical Character Recognition (OCR).
- Employed a pre-trained Neural Network model to build a de-curling engine to flatten the curved single-page images, resulting in improved OCR performance.

COURSES AND SPECIALIZATIONS

Relevant course work -
Machine Learning Algorithms, Computational Robotics, Deep Learning, Cognitive Artificial Intelligence, Learning and Reasoning with Bayesian Networks, Human Centered AI for Vision & Autonomy, Artificial Life for Graphics and Vision, Large Scale Machine Learning.

EXTRACURRICULAR

- Contributed as a member of the Autonomous Underwater Vehicle (AUV) team of IIT Bombay, developing a fully autonomous robot capable of performing challenging tasks as part of RoboSub competition.
- Served as an organizer for Techfest, an annual technical fest hosted at IIT Bombay.
- Represented hostel and school in various badminton and volleyball competitions, demonstrating proficiency in both sports.
- Passionate about solving puzzles and playing chess as a way to improve cognitive abilities and problem-solving skills.