Amlesh Sivanantham

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EDUCATION

08.2017 - 05.2019	**UNIVERSITY OF SOUTHERN CALIFORNIA** **M.S. in Computer Science (GPA: 3.78)** *Concentration: Intelligent Robotics*
09.2013 - 06.2017	**UNIVERSITY OF CALIFORNIA, SANTA CRUZ** **B.S. in Computer Engineering (Honors)** **B.S. in Computer Science** Thesis: *Detecting Anomalies in Time-Series Data using* *Long Short-Term Memory Networks* - Advisor: Dr. Patrick Mantey

SKILLS

LANGUAGES:	**Python**, **C++**, C, Java, JavaScript, Scheme, LATEX, Bash, Verilog
LIBRARIES:	**TensorFlow**, PyTorch, OpenAI Gym, NumPy, Spacy, Matplotlib, Flask, DL4J

WORK EXPERIENCE

06.2019 - PRESENT	**NLP Engineer and Analytic Consultant** *Wells Fargo (Transitioned to Full-Time 11.2019)* Currently working with Natural Language Processing and Deep Learning for A.I. projects within Wells Fargo.
09.2017 - 06.2019	**Graduate Research Assistant** *University of Southern California - Robotic Embedded Systems Laboratory (RESL)* Performed graduate research in Deep Reinforcement Learning and its application to Robotics. Some of the areas I have worked on have been to teach neural networks to infer inverse dynamics of a system (system identification) and learning to integrate control theory with current deep reinforcement learning algorithms. I also participate in reading groups to be caught up with the current literature.
09.2016 - 06.2017	**Undergraduate Research Assistant** *University of California, Santa Cruz - Jack Baskin School of Engineering* Performed undergraduate research in Machine Learning and Deep Learning for the Smart Energy Analytic Disaggregation System project for Dr. Ali Adabi to explore methods to analyze and identify anomalies in time-series data.
04.2017 - 06.2017	**Student Grader for Academic Coursework** *University of California, Santa Cruz - Jack Baskin School of Engineering* Graded homework for Computational Models (CMPS 130) and Analysis of Algorithms (CMPS 102).

PUBLICATIONS

W1. V. Chockalingam, T. T. Sung, F. Behbahani, R. Gargeya, A. Sivanantham, and A. Malysheva. Extending World Models for Multi-Agent Reinforcement Learning in MALMO. In *Joint Proceedings of the AIIDE 2018 Workshops.* AIIDE, Dec 2018

PROJECTS

LEARNING INVERSE DYNAMICS OF A SYSTEM FOR DEEP RL *(USC RESL)*

Instead of having an RL policy learn a mapping from states to actions, we had it learn a mapping from states to desired states. We also learnt an inverse dynamics model concurrently from data generated by the policy. We found that the policy's performance was marginally worse than the standard approach.

PPO with Curriculum Learning for Quadrotor Navigation *(USC RESL)*

Used Proximal Policy Optimization (PPO) with curriculum learning to train a policy to control a quadrotor in a simple OpenGL quadrotor simulator we wrote. We were able to solve the task when we used perfect state information, but when we changed the state to RGB image data from a camera and IMU information, it was unable to learn the task.

Imagination Augmented Agents for Rubik's Cubes *(Jeju DL Summer Camp 2018, S. Korea)*

Participated in the Jeju Deep Learning Summer Camp 2018 where I worked to implement the paper *Imagination Augmented Agents for Deep Reinforcement Learning* and adapt it to work for a Rubik's Cube OpenAI Gym environment that I wrote.

Anime Sketch Coloring with Swish-Gated Residual U-Nets *(USC CSCI 599 - Deep Learning)*

As our group project, we implemented a recent paper titled with the same name. We were able to show that the results of the paper was indeed valid. Our code was also the first implementation of this paper. The paper introduces a type of filtering mechanism between residual layers known as a swish layer which is used to learn realistic coloring of anime line-art.

Deep Q-Learning with Structure2Vec for Solving the Vehicle Routing Problem
(USC CSCI 699 - Topics in Discrete Optimization and Learning)

Worked to adapt previous work done by *Hanjun et al.* that utilized Q-learning and the Structure2Vec graph embedding to solve discrete optimization problems. We adapted the approach to work with the Vehicle Routing Problem domain.

Anomaly Detection in Time Series Data *(Undergraduate Senior Thesis)*

Researched Deep Learning and implemented a long short-term memory network that identifies if a given subsequence of a particular time-series system is anomalous or not. The dataset that I worked with was provided by my faculty advisor which corresponds to the energy usage of an electric meter on the circuit that provides power to the water pump for a small community. After training, the network was able to identify anomalies with an accuracy of 90%.

Who's Lazy? Not Eye *(Hack UCSC 2017)*

A vision therapy program for people with lazy eye using a standard webcam. The app uses the webcam to constantly analyze the user's eyes and notifies them when their eyes drift away. Particularly, the client can pause any media application that the user has playing in the background and will only let them resume their application once they have focused their eyes. I worked on the algorithm that located the position of the pupils using machine learning and identified whether the pupils correlated with lazy eyes or not based on that position.

Othello (Reversi) for the PSoC 5LP *(Project for Microcontroller System Design Class)*

Implemented Othello using C and the Cypress API for the Othello PSoC 5LP. It was built using all the different concepts learned in class. Refer to the report in the documentation directory in the repository for more details.

UCSC Plaza *(Project for Software Engineering Class)*

UCSC Plaza is an event manager designed for members of UCSC. This is simply a prototype. Worked with JavaScript and JQuery to make the interface which connects the front-end to the web-server. Project was developed using Scrum practices.

HummusLite *(Project on Logic Design)*

A simple project I worked on over Summer of 2016. Goal was to build a simple CPU in Minecraft. The CPU supports 16 instructions and has a program data size of 256 bytes. Each instruction is a byte. Programming for the CPU requires using a punch board system that was also built from scratch in Minecraft.

Interests and Hobbies

I am a Linux enthusiast who spends most of my time in the terminal. I am also an avid violinist and competitive gamer for SSBM. Spend a fair amount of time reading about various other sciences because I am very curious about how our physical world works and always wondering how I can relate this back to AGI in some way. I hope that in the future I will be able to find time to write music for fun. I can also solve a bunch of different puzzles (Rubik's cubes, megaminx, etc.).