Shyam Sudhakaran

shyamsnair@protonmail.com | website | github | google scholar | huggingface | linkedin

Recent Work Experience

Modl.ai, Copenhagen, Denmark MAY 2023 - PRESENT
Research Scientist (Contract)

- Trained a suite of AI agents that leverage transformer based neural network architectures to learn from thousands of gameplay videos and bot data for FPS games.
- Improved the efficiency of these agents on CPU with techniques such as distilling knowledge into a smaller network and rewriting components into rust / c++ accelerated frameworks (ggml, candle)

IT University of Copenhagen, Copenhagen, Denmark JANUARY 2021 - MAY 2023
Researcher

- Developed novel large language model based open-ended level generation algorithms, skill discovering reinforcement learning algorithms, and compact, biologically inspired algorithms. See publications for more details.

Amazon Web Services, Cupertino, CA AUGUST 2019 - FEBRUARY 2022
Software Development Engineer

- Helped design and develop a serverless infrastructure in charge of collecting and storing millions of configurations from network devices all across the AWS network. This service was built using Lambda and Step Functions for on demand and scheduled workflow execution.
- Enhanced service monitoring and metrics with a custom ML powered time series correlation analysis engine, enabling for quick root cause analysis.
- Lead a project involving the automated transfer of terabytes of data between multiple AWS datacenters.

Selected Publications

MarioGPT NeurIPS 2023

- paper | github | demo | techcrunch article, kotaku article, pcmag article
- **Shyam Sudhakaran**, *Miguel González-Duque, Claire Glanois, Matthias Freiberger, Elias Najarro, Sebastian Risi*

Open-Ended Libary Learning in Unsupervised Program Synthesis ALIFE 2023

- paper
- Claire Ganoise, **Shyam Sudhakaran**, *Elias Najarro, Sebastian Risi*

Towards Self-Assembling Artificial Neural Networks through Neural Developmental Programs ALIFE 2023

- paper
- *Elias Najarro,* **Shyam Sudhakaran**, *Sebastian Risi*

Skill Decision Transformer NeurIPS 2022 Foundation Models for Decision Making Workshop

- paper
- **Shyam Sudhakaran**, *Sebastian Risi*

Growing 3D Artefacts and Functional Machines with Neural Cellular Automata ALIFE 2021

- paper | github | fastcompany article
- **Shyam Sudhakaran**, *Djordje Grbic, Siyan Li, Adam Katona, Elias Najarro, Claire Glanois, Sebastian Risi*

Selected Open Source Projects

Vexpresso: A scalable, pythonic, multi-modal vector database github

- Vexpresso is a lightweight and scalable multi-modal vector database that utilizes Ray to scale to multi-cpu / multi-gpu clusters.

Hyper-nn: Hypernetworks in Pytorch and Jax github

- A framework for creating Hypernetworks (https://arxiv.org/abs/1609.09106) from generic Pytorch and Flax Modules. Hypernetworks have been shown to be incredibly powerful when it comes to dynamic weights, meta learning, and continual learning.

Optim-rl: Reinforcement Learning as optimization github

- A Pytorch based reinforcement learning library focused on providing flexible, modular components that allow for easy customizability and integration into existing workflows.
- With optim-rl, it becomes trivial to combine algorithms, such as combining PPO's (Proximal Policy Optimization) optimization step with a simple ES (Evolution Strategies) optimization step.

Deep Neuroevolution Self Driving Car Simulation github

- Developed a 3D environment using Unity and C# to simulate self driving cars, controlled by neural networks that use an optimized reimplementation of "Deep GA", a genetic algorithm created by UberAI Labs (reference paper: https://arxiv.org/abs/1712.06567), to learn to navigate through a maze.

BarebonesAI github

- A library of implementations of popular ML algorithms, written with minimal python libraries (numpy). Included algorithms: PCA, KNN, KMeans, Fuzzy KMeans, Naive Bayes, Feedforward Neural Networks

Education

BS in Data Science University of San Francisco Grad. Dec 2018