

Shyam Sudhakaran

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Recent Work Experience

IT University of Copenhagen, Copenhagen, Denmark

JANUARY 2021 - PRESENT

Researcher

- Developed novel LLM 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.

Fujitsu Labs, Sunnyvale, CA

MAY 2019 - AUGUST 2019

Research Intern

- Benchmarked and improved the Graph Neural Network algorithm, "Deep Tensor" using novel generated datasets which simulated network attacks and airline traffic.

Selected Publications

MarioGPT

Preprint 2023

- [paper](#) | [github \(> 700 stars\)](#) | [demo](#) | [techcrunch article](#), [kotaku article](#), [pcmag article](#)
- Shyam Sudhakaran, Miguel González-Duque, Claire Glanois, Matthias Freiberger, Elias Najarro, Sebastian Risi

Skill Decision Transformer

NeurIPS 2022 Foundation Models for Decision Making Workshop

- [paper](#) | [github](#)
- Shyam Sudhakaran, Sebastian Risi

Goal-Guided Neural Cellular Automata

ICLR 2022 Cells to Societies Workshop

- [paper](#) | [github](#)
- Shyam Sudhakaran, Elias Najarro, Sebastian Risi

Hyper Neural Cellular Automata

ICLR 2022 Cells to Societies Workshop

- [paper](#) | [github](#)
- Elias Najarro, 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

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 with working backpropagation.

Multi Agent Battle Simulation [github](#)

- A scalable, interactive, multi-agent AI research platform to test state of the art algorithms in customizable battle scenarios where teams of agents compete to survive.

Education

BS in Data Science University of San Francisco

Grad. Dec 2018