

Shyam Sudhakaran

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Recent Work Experience

Autodesk Research

AUGUST 2024 - PRESENT

Senior Research Engineer

- Trained coding agents for 3D design using reinforcement learning and synthetic data, enabling iterative 3d geometry creation.
- Built a scalable, ray-backed, preference labeling system for ranking generated 3D objects and collecting high-quality evaluation data.
- Trained LLMs for architectural design and multimodal generation of boundary representation (B-rep) CAD geometry.

Modl.ai

MAY 2023 - MAY 2024

Research Scientist

- 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

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

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.

Highlighted Projects

LMFlow: Recursive Language Models as dynamic execution graphs

[github](#)

A Python framework for building recursive LLM agents as inspectable execution graphs, making sub-agent delegation replayable, forkable, and debuggable.

Tinkerbelle: Open source Tinker implementation with Ray and SGLang

[github](#)

A lightweight open-source reimplementation of Tinker for LLM training and inference, using Ray, PyTorch, and SGLang to run AI workflows across remote GPUs.

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.

Highlighted Publications

Smart Cellular Bricks for Decentralized Shape Classification and Damage Recovery

Nature 2025

Rodrigo Moreno, Andres Faina, Shyam Sudhakaran, Kathryn Walker, Sebastian Risi

Generative Design through Quality-Diversity Data Synthesis and Language Models

Gecco 2024

Adam Gaier, James Stoddart, Lorenzo Villaggi, Shyam Sudhakaran

MarioGPT: Open-Ended Text2Level Generation through Large Language Models

NeurIPS 2023

Shyam Sudhakaran, Miguel González-Duque, Claire Glanois, Matthias Freiberger, Elias Najarro, Sebastian Risi

Open-Ended Library Learning in Unsupervised Program Synthesis

ALIFE 2023

Claire Ganoise, Shyam Sudhakaran, Elias Najarro, Sebastian Risi

Towards Self-Assembling Artificial Neural Networks through Neural Developmental Programs

ALIFE 2023

Elias Najarro, Shyam Sudhakaran, Sebastian Risi

Skill Decision Transformer

NeurIPS 2022

Shyam Sudhakaran, Sebastian Risi

Growing 3D Artefacts and Functional Machines with Neural Cellular Automata

ALIFE 2021

Shyam Sudhakaran, Djordje Grbic, Siyan Li, Adam Katona, Elias Najarro, Claire Glanois, Sebastian Risi

Education

BS in Data Science University of San Francisco