Mayukh Deb

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DOB: 09-11-2000
(dd-mm-yy)

Research Engineer @ Aleph-Alpha

May 2022 - present

Reverse engineering Large (Multimodal) Language Models (LLMs) for Interpretability. Building tools which help us understand how GPT-like models do what they do.

RESEARCH

AtMan: Understanding Transformer Predictions Through Memory Efficient Attention Manipulation

January 2023

Mayukh Deb, Björn Deiseroth, Samuel Weinbach, Patrick Schramowski, Kristian Kersting
https://arxiv.org/abs/2301.08110

DORA: Exploring outlier representations in Deep Neural Networks

June 2022

Kirill Bykov, **Mayukh Deb**, Dennis Grinwald, Klaus-Robert Müller, Marina M.-C. Höhne
https://arxiv.org/abs/2206.04530

EXPERIENCE

Research Intern @ Aleph-Alpha

November 2021 - April 2022

Building tools to make large language transformers (like GPT-3) and multimodal transformers (like MAGMA) more interpretable to humans.

Google Summer of Code 2020 @ INCF

May 2020 - August 2020

Collaborated with OpenWorm to build a set of deep-learning based tools to extract useful metadata from microscopic videos/images of the C. elegans embryo.

Intern @ RunwayML

January 2021 - February 2021

Implemented, optimized and dockerized DL pipelines for:

- Tracking key-points on videos with a RAFT based model. It ended up being 41% faster than the original version.
- Generating interpolations between frames for slow-motion with Real-Time Intermediate Flow Estimation (RIFE).

Author: Torch-Dreams

September 2020 - Present

Torch-Dreams is a tool used to reverse engineer vision models in PyTorch using feature visualization. It has over 200 stars on GitHub and is actively used by research groups like the UMI Lab@TU Berlin.

SKILLS

PyTorch
NumPy
Googling
Figuring things out

LANGUAGES

English
Bengali
Hindi

Author: Devolearn

August 2020 - Present

DevoLearn is a python library which helps accelerate data driven research on embryos with Pre-Trained deep learning models used for feature extraction directly from microscopic videos and images.

Author: Eden

July 2021 - Present

Eden helps to deploy python functions as a hosted endpoint with support for multiple GPUs with minimal changes to the existing code. It used to power the AI art pipelines behind abraham.ai and was the foundational pet-project which eventually led to eden.art

Member + Mentor: amFOSS

July 2019 - April 2022

amFOSS is India's leading computer science club with over 50 passionate students who actively contribute to open source software.

WRITING

Learning to Make the Right Mistakes - a Brief Comparison Between Human Perception and Multimodal LMs

July 2021

This article was written for TheGradient. It can be found here.

HACKATHONS

3rd Prize: MLOps for Good Hackathon

July 2021

Built deepfake-shield, a web-app to detect faces from within an image and determine if they're deep-fakes or not.

RELEVANT PROJECTS

Differentiable-morphogenesis

March 2021

Implemented differentiable self organizing systems using neural cellular automata on PyTorch.

Patrick

December 2020

Tiny neural net library written from scratch with CuPy.

Gradient Games

August 2020

Wrote simple neural networks on numpy from scratch along with their backpropagation algorithms and visualized the weights as they trained.

Deep chicken terminator

February 2020

Tracked various animals using deep-learning from the live feed of the player's perspective in the game Minecraft.

Deep chicken saviour

March 2020

Generated "adversarial textures" within the game which were misclassified as animals by the model from deep chicken terminator.

Mind the bend

December 2019 - August 2020

Made a car steer by itself in a 3D racing game using an ensemble model and some automation with PyAutoGUI. The model was trained on custom data which comprised of images from two perspectives of the road for better performance

EDUCATION

B. Tech, Electrical and Computer Engineering, Amrita Vishwa Vidyapeetham

Expected Mid-2023

CGPA: 7.93

Higher Secondary, Amrita Vidyalayam, Kolkata

2018

Marks: 93%

VOLUNTEER WORK + EXTRACURRICULAR ACTIVITIES

Black Belt in Kyokushin Karate

I've been a part of the martial arts class in my school and participated in multiple tournaments in Kolkata, India under the mentorship of Sensei Bejoy Dhara, branch chief and country representative for IKO Matsushima.

Co-ordinated charity events to support villages

Helped put together events where students donated basic medical supplies and other utilities which were to be given to the poor and needy children in villages near Kolkata, India. This programme was a part of Mata Amritanandamayi devi's (Popularly known as "Amma") efforts to help the poor and the needy throughout the world.

Amala Bharatam

Volunteered on clean-up drives in Kolkata as a part of the "Amala Bharatam" programme under Mata Amritanandamayi Math