Aayush Mishra

Baltimore, USA amishr24@jhu.edu +1 667-379-9669 aamixsh.github.io aamixsh

`I work on making Artificial Intelligence systems robust, explainable and efficient.`

Education

Johns Hopkins University `Jan 2022 - ongoing`
Ph.D. in Computer Science
M.S.E. in Computer Science – GPA: 4.0/4.0 (transcript) `completed Dec 2023`

Indian Institute of Technology Mandi `Aug 2015 - Jun 2019`
B.Tech. in Computer Science and Engineering – GPA: 8.88/10.0 (transcript)
with Minor in Management

Experience

Adobe `May 2024 - Aug 2024`
Research Intern [Document Intelligence Lab]

- Developed EigenLoRA, a method to recycle trained LoRAs for parameter efficient training of new adaptors; and memory efficient inference of multiple adaptors, aimed at LLM/diffusion model use in edge devices.

Microsoft
Data & Applied Scientist [Bing Shopping Team] `Aug 2021 - Jan 2022`

- Worked on query → product class mapping (∼18k classes) to capture fine-grained user intent.
- Developed a relevance metric to improve ranking of sale offers.

Siemens
Research Engineer [Automation] `Jul 2019 - Aug 2021`

- Developed a method that explains CNNs and helps compress them for deployment on edge devices.
- Used ProGAN to generate realistic traffic scenes for stress-testing object detection models (YOLO). Devised a procedural generation language based on GAN-Dissection to create images based on a description.
- Used RL to find edge-case scenarios where self-driving agents violate safety properties (in CARLA simulator).

Research Intern [Automation]

- Classification of Siemens Social Network posts using statistical NLP. `Summer 2018`
- Code reuse recommendation based on semantic search (Latent Semantic Analysis). `Winter 2017-2018`

Publications/Research

- *EigenLoRA: Recycle trained Adapters for Resource Efficient Adaptation and Inference* 2024
  Aayush Mishra*, Prakhar Kaushik*, et al. [pre-print]
- *Do pretrained Transformers Learn In-Context by Gradient Descent?* 2024
  Aayush Mishra*, Lingfeng Shen*, Daniel Khashabi [ICML (Oral) paper]
- *Source-Free and Image-Only Unsupervised Domain Adaptation for Category Level Object Pose Estimation* 2024
  Prakhar Kaushik, **Aayush Mishra**, et al. [ICLR paper]
- *Repeated Environment Inference for Invariant Learning* 2022
  Aayush Mishra, Anqi Liu [ICML SCIS workshop paper]
- *VStegNET: Video Steganography Network using Spatio-Temporal features and Micro-Bottleneck* 2019
  Aayush Mishra*, Suraj Kumar*, et al. [BMVC paper]
- *Generating Masterprints* 2019
  Aayush Mishra [bachelor's thesis]

Projects

CricScorer [IRWA course project] 2023
- Live Cricket scorer to store and retrieve data/stats at the highest resolution. [report]

Stress testing Chain-of-Thought Prompting [SSL course project] 2022
- Tested the robustness of Chain-of-Thought prompting with noisy labels in GPT-3. [report]

Surgical Tool Segmentation [DL course project] 2022
- Developed a novel data augmentation technique to improve tool segmentation performance. [report]

Teaching Experience

Machine Learning [JHU] Spring 2024
Deep Learning and its Applications [IIT Mandi] Spring 2019
Artificial Intelligence [IIT Mandi] Fall 2018

Designed homeworks/exams in all courses. Held tutorials and taught lectures on Self-Supervised Learning. [link]

Skills

Python
C++
Machine Learning Toolkits (`torch`, `transformers`, etc.)
Data Engineering
Software Engineering