Anesa Ibrahimi

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GitHub Profile
LinkedIn Profile

Summary

A recent Artificial Intelligence graduate with a strong passion for continuous learning and problem-solving. Eager to expand my expertise and contribute to meaningful projects in the dynamic, ever-evolving field of AI.

Technical Skills and Interests

Programming Skills: Python, SQL, MATLAB
Deep Learning Frameworks: TensorFlow, PyTorch, Keras
Field of Interest: Machine Learning, Deep learning, Computer Vision, Reinforcement Learning

Education

- **Universiteit van Amsterdam** *2023-2025*
  MSc. Artificial Intelligence Amsterdam, Netherlands
- **Vrije Universiteit Amsterdam** *2020-2023*
  BSc. Artificial Intelligence, Specialisation : Intelligent Systems, Minor: Data Science Amsterdam, Netherlands

Experience

- **Vrije Universiteit Amsterdam** *March 2023 - May 2023*
  Professor's Assistant - Databases Amsterdam
  Professor: Dr. J. Endrullis
  – Planned and Taught Weekly Practicals
  – Explained and assisted students with several Databases Objectives such as:
    * The understanding of relational database systems
    * Development of Database models
    * Search/Update Databases through SQL
  – Supervised Progress of Students
- **Vrije Universiteit Amsterdam** *March 2022 - May 2022*
  Professor's Assistant – Human-Computer Interaction Amsterdam
  Professor: Dr. E.M.A.L. Beauxis Aussalet
  – Planned and Taught Weekly Practicals
  – Explained and assisted students with several HCI Objectives such as:
    * The principles and techniques of Interactive Systems
    * Application of low/high fidelity prototyping methods
    * Evaluation and Validation of custom systems
  – Supervised Progress of Students

Personal Projects

- **Fine-grained image understanding with Vision-Language Models** *January 2025 - August 2025*
  Master Thesis Project
  – Designed and implemented a novel **Memory-Augmented Vision Encoder** by integrating trainable key-value memory modules into the MLP layers of a Vision Transformer (ViT).
  – Developed a two-stage training pipeline leveraging **knowledge distillation** to transfer representations from a pre-trained CLIP (teacher) to the memory-enhanced student model, enabling efficient training.
  – Achieved state-of-the-art performance, decisively outperforming the baseline CLIP model on **long-caption, fine-grained retrieval benchmarks**
  – **Technologies:** Python, PyTorch, CUDA, OpenAI CLIP, Vision Transformers, HPC (Slurm, NVIDIA A100/H100).
- **Multi-Modal NAO Robot** *October 2024 - December 2024*
  Part of UvA - VU Socially Intelligent Robotics Course 2024/2025
  – Led a 7-member team in developing a **multi-modal emotion recognition and response system** for the NAO robot, integrating speech, text, and vision models (RoBERTa, SpeechBrain, LLaMA Vision) with emotional speech synthesis (OpenVoice).
  – Designed and coordinated the interaction pipeline to enable **empathetic, real-time human-robot interaction**, ensuring smooth integration of multiple modalities.

– Conducted experimental trials with human participants to evaluate emotion detection accuracy, empathy perception, and user satisfaction, providing insights into **improving emotional intelligence in robotics**.
– **Technologies:** Python, PyTorch, Docker, OpenVoice, HuggingFace models, NAO Framework.

- **LLM4CS** *October 2024 – December 2024*
  Part of the Information Retrieval 2 course 2024/2025

  – Reproduced and extended the *LLM4CS* framework to evaluate large language models as contextual search intent interpreters in multi-turn conversations.
  – Benchmarked prompting strategies and aggregation methods across dense and sparse retrieval pipelines.
  – **Technologies:** Python, Pyserini, Information Retrieval, LLMs, Prompt Engineering, Dense & Sparse Retrieval

- **AI4MI – SegTHOR Challenge** *September 2024 – October 2024*
  Part of the UvA AI for Medical Imaging course 2024/2025

  – Developed and compared CNN-based models for segmenting esophagus, heart, trachea, and aorta on SegTHOR CT scans.
  – Addressed class imbalance and boundary errors via loss tuning and preprocessing.
  – **Technologies:** Python, PyTorch, Medical Image Segmentation, 3D Slicer, Evaluation Metrics

- **In-Context Learning Improves Compositional Understanding of Vision-Language Models** *April 2024 - May 2024*
  Part of the UvA Foundation Models course 2023/2024

  – Tools & technologies used: Python, Jupyter Notebook, Vision Language Models, Compositional Understanding, In-Context Learning
  – Compared contrastive and generative VLMs, analyzing architecture, pre-training data, and training tasks.
  – Achieved improved performance over baseline models in compositional understanding benchmarks.
  – Culminated in a **published paper**, contributing new insights to the field of Vision-Language Models and compositional understanding.

- **Instance Diffusion - Extension** *April 2024 - May 2024*
  Part of the UvA Deep Learning 2 course 2023/2024

  – Tools & technologies used: Python, Jupyter Notebook, Computer Vision, Machine Learning
  – Automated the generation of image descriptions and instance bounding boxes using a Large Language Model, reducing the need for manual input data.
  – Achieved increased efficiency and scalability in image generation processes while maintaining comparability with original study results.

- **Optimizing Locomotion with Evolutionary Algorithms in MuJoCo** *March 2023 – June 2023*
  Bachelor Thesis Project – Vrije Universiteit Amsterdam

  – Explored the potential of **Evolutionary Algorithms (CMA-ES, XNES, SNES)** for solving continuous control optimization problems in the **MuJoCo Ant environment**.
  – Designed and implemented a full **simulation and optimization pipeline** for evolving the ant agent's locomotion behavior across 100 virtual environments with varying terrain densities and obstacle heights.
  – Conducted quantitative and qualitative analyses to benchmark the performance of each algorithm.
  – **Technologies:** Python, MuJoCo, OpenAI Gym, EvoTorch, NumPy, Pandas, Matplotlib.

Publications

•**Anesa Ibrahimi**, Matteo Nulli, Avik Pal, Hoshe Lee, Ivona Najdenkoska, *In-Context Learning Improves Compositional Understanding of Vision-Language Models*, arXiv, 2024. https://arxiv.org/abs/2407.15487

–Paper published at ICML Foundation Models in the Wild Workshop

Achievements

- **A Honours** Awarded for achieving and maintaining a 4.0 GPA throughout high school.
- **Piano - Music School** Successfully completed an 8-year music school program, specializing in piano. *2011-2019*