Mohamed Abdelfattah

Lausanne, Switzerland

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Education

École Polytechnique Fédérale de Lausanne (EPFL)   *Lausanne, Switzerland*

Ph.D. in Computer Vision   *Dec 2026 (Expected)*

- Supervised by Alexandre Alahi at VITA Lab
- Building SOTA frameworks in *Multimodal Large Language Models (MLLMs)*, *self-supervised learning*, and *action understanding*
- First-author of top-tier conference publications at **CVPR**, **NeurIPS**, and **ECCV**; co-author at **EMNLP**.

The American University in Cairo (AUC)   *Cairo, Egypt*

B.S. in Computer Engineering   *Jun 2022*

- Graduated with Highest Honors (Rank: 5/80, GPA: 3.91/4.0), recognized on the Dean's List of Honors
- Double Minor in Mathematics and Business Administration
- **Thesis Title:** Fine-Grained Text-to-Image Generation using Generative Adversarial Networks (GANs).
- IELTS 8.5/9.0, GRE: Math 170/170, Verbal 161/170, Writing 5.5/6.

Publications

OSKAR: Omnimodal Self-supervised Knowledge Abstraction and Representation
  Mohamed Abdelfattah*, Kaouther Messoud*, Alexandre Alahi
  Advances in Neural Information Processing Systems **NeurIPS**. 2025

S-JEPA: A Joint Embedding Predictive Architecture for Self-Supervised Skeletal Action Recognition
  Mohamed Abdelfattah, Alexandre Alahi
  European Conference on Computer Vision **ECCV**, 2024

MaskCLR: Attention-Guided Contrastive Learning for Robust Action Representation Learning
  Mohamed Abdelfattah, Mariam Hassan, Alexandre Alahi
  Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition **CVPR**, 2024

Toward contactless human thermal monitoring: A framework for Machine Learning-based human thermo-physiology modeling augmented with computer vision
  Mohamad Rida, Mohamed Abdelfattah, Alexandre Alahi, Dolaana Khovalyg
  Building and Environment 110850. Elsevier, 2023

Zerowaste dataset: Towards deformable object segmentation in cluttered scenes
  Dina Bashkirova, Mohamed Abdelfattah, Ziliang Zhu, James Akl, Fadi Alladkani, Ping Hu, Vitaly Ablavsky, Berk Calli, Sarah Adel Bargal, Kate Saenko
  Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition **CVPR**, 2022

ArtELingo: A Million Emotion Annotations of WikiArt with Emphasis on Diversity over Language and Culture
  Youssef Mohamed, Mohamed Abdelfattah, Shyma Alhuwaider, Feifan Li, Xiangliang Zhang, Kenneth Church, Mohamed Elhoseiny
  Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing **EMNLP**, 2022

Research Experience

Meta Reality Labs   *Zurich, Switzerland*

AI Research Scientist Intern   *May – Nov 2025*

- Created a novel dataset and benchmark, and developed a **Multimodal Large Language Model** for robust perception of human states.
- Authored a first-author research paper currently under review for CVPR 2026.

SpreeAI   *Nevada, USA*

Computer Vision Research Scientist   *Jul 2022 – Feb 2023*

- Developed a **conditional diffusion model** that enhanced high-quality user face reconstruction, resulting in a **20% improvement** in performance compared to previous methods.
- Innovated a U-Net architecture for **head swapping** that effectively preserved **pose, skin tone, and illumination**, improving realism in AI-powered photorealistic try-on.

King Abdullah University of Science and Technology (KAUST)   *Thuwal, Saudi Arabia*

Deep Learning Intern (Prof. Mohamed Elhoseiny, Vision-CAIR Group)   *Mar 2022 – Jan 2023*

- Led the collection of the first and largest **vision-language dataset** with affective captions and explanations in four languages.
- Co-developed training techniques and recipes for leveraging diversity of language and culture towards superior performance in image captioning and emotion prediction tasks. Co-authored and published a high-impact paper at **EMNLP 2022**.

Boston University   *Boston, USA*

Remote Visiting Research Student (Prof. Sarah Bargal, IVC Group)   *Jun 2021 – Dec 2021*

- Designed and implemented **data augmentation pipelines** tailored to preserve object characteristics and dataset diversity.
- Delivered insights into the challenges of balancing datasets and optimizing segmentation performance in deformable industrial waste objects.
- Co-authored and published a pioneering paper at **CVPR 2022**.

Featured Projects

MaskCLR: Robust Transformers for Action Recognition   *Lausanne, Switzerland*

CVPR 2024   *EPFL*

- Proposed a novel **masking strategy** that selectively drops the most important joints in the human skeleton sequence, helping transformers learn from previously-unexplored, information-rich joints for skeleton-based action classification.
- Developed a multi-level **contrastive learning** framework to enforce the representations of standard and occluded skeletons to be class-discriminative, forming better decision boundaries and boosting the overall model accuracy and robustness.
- Achieved SOTA results on NTU60, NTU120, and Kinetics400 datasets, outperforming prior models on perturbed and incomplete skeletons.

S-JEPA: A New Pretext Task for Self-Supervised Action Recognition   *Lausanne, Switzerland*

ECCV 2024   *EPFL*

- Proposed a new **pretext task** based on predicting the latent representations of missing joints, focusing on high-level contextual information.
- Introduced a centering operation to stabilize training and enhance the quality of learned representations.
- Outperformed SOTA methods on NTU60, NTU120, and PKU-MMD datasets using a vanilla transformer architecture.

ArtELingo: Multi-Modal Understanding Through Language Diversity   *Thuwal, Saudi Arabia*

EMNLP 2022   *KAUST*

- Spearheaded the collection of an extensive **1.5 million dataset** (ArtELingo), comprising **84,000 artworks** with affective human captions in English, Arabic, Chinese, and Spanish, supporting cultural and linguistic diversity in AI.
- Co-developed novel algorithms for **multi-modal understanding**, boosting performance on image captioning and emotion prediction tasks by leveraging cross-language and cross-culture diversity.

Skills

Coding	Python, PyTorch, TensorFlow, CUDA, Git, Docker, OpenCV, NumPy, SciPy, Scikit-learn
Deep Learning	Self-Supervised Learning, Representation Learning, Transfer Learning, Graph Neural Networks
Computer Vision	Semantic Segmentation, Object Detection, Feature Extraction, 3D Human Pose Estimation
Languages	English (Fluent), Arabic (Native)

Achievements

2022	**PA Cup**, for top academic and extracurricular achievements in the class of 2022	*AUC*
2022	**High Academic Achievement Award**, for graduating among the top 5 students in the class of 2022	*AUC*
2021	**Research Grant**, awarded 4,000 USD for impactful research contributions in computer vision	*AUC*
2019	**Best Design Award**, for designing the most efficient mine-detection rover at a national robotics competition	*Minesweepers*
2019	**ROV Excellence Award**, for ranking in the top 10 teams in the middle east in the MATE ROV Competition	*MATE ROV*
2018	**First Place**, for solving the most competitive programming problems in the CSCE Programming Contest.	*AUC*
2018	**Highest Achiever and Reader of the Year**, for authoring the rhetorically strongest essays in 2018.	*AUC*
2017	**AGFE Full Scholarship**, awarded a 160,000 USD scholarship for outstanding potential in STEM fields	*AUC*

Teaching Experience

École Polytechnique Fédérale de Lausanne (EPFL)   *Lausanne, Switzerland*

Lead Teaching Assistant, Deep Learning for Autonomous Vehicles   *Feb 2023 – Jun 2024*

- Championed an ambitious project enabling **+150 EPFL master's students** to collaboratively design and implement a **Tesla Autopilot** prototype from the ground up.
- **Led a team of Ph.D. TAs** in transforming course structure, mentoring high-achieving student teams in a competitive landscape.
- Facilitated engaging weekly **coding workshops** focused on deepening students' understanding of **PyTorch**.
- Oversaw course deliverables and timelines, tracking student progress through challenging **Kaggle** competitions.

The American University in Cairo (AUC)   *Cairo, Egypt*

Deep Learning Teaching Assistant   *Sep 2020 – Dec 2021*

- Mentored and guided students in designing and implementing the foundational building blocks of **deep neural networks** using numpy, fostering hands-on skills essential for future researchers.
- Helped students gain the intuition behind complex machine and deep learning concepts.