



Amr Amer

Machine Learning Engineer

M.Sc. Visual Computing, Saarland University

Computer Vision · Multimodal AI · Deep Learning

Contact

📍 Saarbrücken, Germany

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🏠 Portfolio: amramer.github.io

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Skills

Programming Languages

Python, Java, C++ (14/17/20/23), CUDA
C++, SQL, Bash

C++ Core Language

OOP (Inheritance, Polymorphism, Encapsulation), RAII & Smart Pointers (unique_ptr, shared_ptr, weak_ptr), Move Semantics & Perfect Forwarding, Templates & Generic Programming, STL (Algorithms, Iterators, map, set, unordered_map, priority_queue), Concurrency (std::thread, mutex, std::async) Modern C++ (Lambdas, constexpr, auto, Range-based Loops)

Machine Learning

PyTorch, TensorFlow, Scikit-learn, MONAI (Medical Imaging), Hugging Face Transformers, FastAI

Computer Vision

OpenCV, YOLO (v8/v10), DETR, SAM, ByteTrack, DeepSORT, TrackNet, Homography & Camera Calibration, Instance & Semantic Segmentation, 3D Human Mesh Recovery, SMPL-X, PIXIE

Profile

Machine Learning Engineer specializing in Computer Vision and Deep Learning, with an M.Sc. in Visual Computing from Saarland University. Proven track record delivering production-ready ML systems from distributed GPU training and multimodal generative models to high-performance C++ inference and end-to-end deployment.

Portfolio Website: [🔗 amramer.github.io](https://amramer.github.io)

Experience

ML Research Engineer

09/2021 – 12/2025

German Research Center for Artificial Intelligence (DFKI), Saarbrücken

- Developed end-to-end reproducible ML pipelines (PyTorch) with data versioning (DVC), experiment tracking (MLflow), automated testing (PyTest), and CI/CD across all training workflows.
- Scaled Vision Transformer and CNN training across NVIDIA A100 GPU clusters (CUDA, DDP, SLURM); applied hyperparameter optimization (W&B Sweeps) to reduce training overhead and identify optimal configurations.
- Developed a real-time 3D human motion generation system (ViT, VQ-VAE, SMPL-X/PIXIE) for personality-conditioned avatar synthesis; achieved state-of-the-art FID = 6.15 and P-FID = 10.31 on the UDIVA benchmark.
- Validated model expressiveness through structured user studies, achieving 86% accuracy in distinguishing extroverted vs. introverted avatar behaviors.
- Optimized inference pipelines by deploying PyTorch models via TensorRT and ONNX Runtime into native C++ code; benchmarked performance.

Tech Stack: PyTorch · C++ · CUDA · TensorRT · ONNX Runtime · SLURM · Enroot · Docker · MLflow · W&B · Git · PyTest · CI/CD

Software Developer (Backend & Data Systems)

10/2016 – 08/2020

General Authority of Civil Aviation (GACA), Jeddah, Saudi Arabia

- Developed secure backend web services using Java and scaled enterprise data integrations across high-volume aviation systems using Oracle SOA Suite.
- Optimized relational database schemas and authored PL/SQL stored procedures to accelerate data throughput for large-scale operational workloads.
- Refactored legacy code into modular, object-oriented architectures to improve system maintainability.

Tech Stack: Java · Oracle SOA Suite · PL/SQL · SQL · Web Services (SOAP/REST) · Object-Oriented Design (OOD) · Git

Software Engineering Intern

04/2016 – 09/2016

Ejada Systems, Alexandria, Egypt

- Developed and tested enterprise J2EE software components to support scalable backend applications.
- Built and optimized SQL queries and database modules to ensure efficient data access.

Tech Stack: Java · J2EE · SQL · Relational Databases

Deep Learning/ML Architectures

CNNs (ResNet, EfficientNet, VGG), U-Net, GANs (Conditional, CycleGAN), Diffusion Models, Vision Transformers (ViT, Swin, DeiT), Autoencoders (VAE, VQ-VAE), Detection Transformers (DETR, RT-DETR)

MLOps & Experimentation

MLflow, Weights & Biases, TensorBoard, Optuna, Experiment Tracking, Model Versioning, Reproducible Pipelines

Deployment & Infrastructure

Docker, Kubernetes, FastAPI, ONNX Runtime, TensorRT, AWS (EC2, S3, ECR), Multi-GPU Training (DDP), SLURM

Software Engineering

Git, GitHub, CI/CD, Scrum, REST APIs, PyTest, Performance Profiling, Linux

Languages

- ▶ English — C1/C2
- ▶ German — B1 (Actively Learning)
- ▶ Arabic — Native

Education

Visual Computing (M.Sc.)

10/2020 – 04/2024

Saarland University, Saarbrücken, Germany

Degree: *Master of Science, Grade: 1.9*

[🔗 Thesis Website](#) | [🔗 Thesis Code](#)

- **Master's Thesis:** *Personality-Aware Non-verbal Behavior Generation in Dyadic Interactions* (collaboration with the Max Planck Institute for Informatics and DFKI Saarland).
- Developed a multimodal generative model using **Vision Transformers, VQ-VAE**, and **PIXIE (SMPL-X)** to synthesize realistic listener avatars conditioned on personality traits.
- Built and deployed an end-to-end pipeline for data preprocessing, PyTorch training, and evaluation on **SLURM clusters** with **NVIDIA A100 GPUs**, including hyperparameter optimization.
- Achieved state-of-the-art performance on UDIVA (**FID = 6.15, P-FID = 10.31** for facial expressions; **FID = 43.16, P-FID = 87.73** for body and hand gestures), with user studies showing **86% accuracy** in identifying extroverted vs. introverted avatars.

Computer Engineering (B.Eng.)

09/2011 – 02/2016

Arab Academy for Science and Technology, Egypt

Degree: Bachelor of Engineering, GPA: 3.2/4.0

- Thesis: Sign Language Translator System using Kinect device, implemented in C++ [📺 Watch Demo](#)

Projects

- **Badminton-VisionAI** [🔗](#)
Developed ML pipeline for player & shuttle tracking, shot classification, and mini-court projection; achieved **92% shot detection accuracy**.
(OpenCV · YOLOv8 · SAM · TrackNet · Homography · Docker · Streamlit · Plotly)
[🔗 Live Demo](#) [📺 Video](#)
- **Personality-Aware Non-verbal Behavior Generation** [🔗](#)
Implemented a Vision Transformer based model to generate personality-conditioned avatars; achieved **86% accuracy** in distinguishing extroverted/introverted traits.
(PyTorch · Transformers · SMPL-X · CUDA · SLURM · Multi-GPU Training (A100))
[🔗 Thesis Website](#) [📄 Thesis Document](#)
- **MePheSTO (DFKI Research Project)** [🔗](#)
Developed ML pipeline analyzing video - speech - biosignal data to derive behavioral markers for psychiatric disorders.
(PyTorch · Transformers · Multimodal Fusion · Enroot · SLURM · TensorBoard)
- **Semantic Segmentation for Autonomous Driving** [🔗](#)
Built segmentation pipeline on BDD100K dataset with optimized preprocessing & training; achieved **mIoU = 0.45** (road: 0.88, vehicles: 0.78) and **30% faster inference**.
(PyTorch · Fastai · Semantic Segmentation · Optuna · Weights & Biases)
- **3D Brain Tumor Segmentation** [🔗](#)
Developed 3D SegResNet pipeline using MONAI for MRI segmentation; achieved **Mean Dice = 0.78** (WT: 0.90, TC: 0.82) and reduced false positives by **20%**.
(PyTorch · Dice-Loss · MONAI · 3D CNNs · Sliding Window Inference)

Additional projects and demos: [🔗 amramer.github.io](#)