# Sepehr Mahmoudian

## SENIOR AI ENGINEER

Machine Learning • Knowledge Graphs • Multimodal & Embodied AI


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GITHUB github.com/sepahead LINKEDIN linkedin.com/in/sepehr-mahmoudian

Berlin-Brandenburg • available from Oct 2026 • German citizen • EN fluent / DE good / Persian native


PROFILE

Senior AI Engineer with 10+ years across research and production. Builds Python/Rust systems for knowledge graphs and Graph RAG, multimodal AI and embodied AI, LLM/VLM pipelines, Vision-Language-Action (VLA) evaluation and computer vision.

**LLMs / VLMs • Knowledge Graphs • VLA Evaluation • Model Evaluation**

OPEN SOURCE • DATA PROVENANCE • MODEL VALIDATION • AI SYSTEMS

AI ENGINEERING

**10+ YEARS**

RESEARCH TO PRODUCTION

PYTHON • RUST • AI / ML

## PROFESSIONAL EXPERIENCE

### Independent AI/ML Engineer & PhD Candidate

2020.04 - Present

**Self-employed - PhD candidate at Technische Universität Darmstadt** Berlin & Darmstadt, Germany

- Developing evidence-linked neural models, new PID analyses, VLA evaluation and neural control protocols
- Multimodal 3D perception and auditable scientific visualization; publishing open-source models and datasets

### Senior AI Engineer

2026.01 - 2026.03

**Neural Frames UG** Berlin & Hamburg, Germany

- Evaluated LLMs, VLMs and end-to-end pipelines, tracing runs and results with Langfuse
- Contributed to Python pipelines for model evaluation and inference

### AI Engineering Resident (Hacker Room)

2025.09 - 2026.01

**Merantix AI Campus** Berlin, Germany

- Built Dreamweave, a generative-media system combining Gaussian splatting and diffusion models for spatial and temporal anchoring
- Implemented confidential-computing smart contracts in Rust under a NEAR Foundation contract
- Deployed product services and data infrastructure across Cloudflare Workers, D1, R2, Google Cloud Run and AWS EC2

### Senior AI Engineer

2024.07 - 2025.07

**Vision Labs UG (haftungsbeschränkt)** Berlin & Hamburg, Germany

- Built workflows for prompt optimization, LLM evaluation and observability with DSPy and Langfuse
- Designed data and MLOps pipelines on Azure and Google Cloud with staging, automated tests and CI/CD

### Research Associate

2021.07 - 2024.07

**Freie Universität Berlin** Berlin, Germany

- Scaled and optimized large neural-network simulations in C/C++ and Python
- Built retrieval-augmented generation (RAG) workflows for technical literature and evaluated AI-agent reliability
- Applied statistical and machine-learning analysis in Python; reviewed code and research manuscripts in an international team

### Research Associate
2019.07 - 2020.06

**Georg-August-Universität Göttingen** · Göttingen, Germany

Neural networks and reproducible data workflows

### Research Associate
2017.03 - 2019.07

**Goethe-Universität Frankfurt** · **Frankfurt am Main, Germany** · Simulation and statistical analysis of neural-network models

### Visiting Scientist
2017.03 - 2019.03

**Max Planck Institute for Dynamics and Self-Organization** · **Göttingen, Germany** · Statistical methods for neural-network analysis

### Research Associate
2015.02 - 2017.03

**Forschungszentrum Jülich** · **Jülich, Germany** · Neural-network simulations and reinforcement-learning experiments

### Software Developer
2010.09 - 2012.03

**Centre for Content Creation** · **Cyberjaya, Malaysia** · Award-winning iPhone/iPad applications and digital products

## EDUCATION

### PhD Candidate (Dr. rer. nat.)
2020.04 - Present

**Technische Universität Darmstadt** · Darmstadt, Germany

- Dissertation in final preparation: Partial Information Decomposition (PID)
- New mathematical PID analyses and information-theoretic representation analysis form the dissertation core; agentic workflows turn computational-neuroscience papers into evidence-linked models; related tools support auditable AI experiments

### Master's by Research in Biosciences: Neuroscience
2012 - 2014

**University College London** · London, United Kingdom

Computational Neuroscience • Graduated with Distinction (Top 10%, CGPA 4.0/4.0)

### Bachelor of Science (Honours) in Computer Science
2009 - 2012

**Anglia Ruskin University** · Cambridge, United Kingdom

Graduated with First Class Honours (Top 1%, CGPA 4.0/4.0)

## SELECTED AWARDS & FUNDING

**EDTH / 2025**
Vision and scene-reconstruction award from the Bundeswehr Cyber Innovation Hub

**HUMAN BRAIN PROJECT**
Research funding

**NEAR HORIZON**
Confidential-computing grant

**UCL & SHEFFIELD**
Competitive academic scholarships

**IOS APPLICATIONS**
15 international product awards

**SIGNATURE**
Sepehr Mahmoudian

**PLACE** Berlin, Germany
**DATE** 8 August 2026

**PUBLIC ENGINEERING PORTFOLIO**

**GITHUB** Open-source projects
github.com/sepahead

**HUGGING FACE** Models & datasets
huggingface.co/torusprime

# SELECTED AI ENGINEERING PROJECTS

## engram

RESEARCH PROTOTYPE

EVIDENCE-LINKED MODELS

Turns computational-neuroscience papers into evidence-linked specifications and bounded NEST artifacts, keeping recorded modeling decisions auditable.

Python · Knowledge Graphs · NEST

## pid-rs

V0.9 PRERELEASE

INFORMATION DECOMPOSITION

Decomposes information into shared, unique and synergistic parts, with method-level provenance and explicit research boundaries.

Rust / Python · Information Theory · Statistical ML

## prisoma

0.9 CANDIDATE

AUDITABLE VLA EXPERIMENTS

Research toolkit for auditable VLA capture, intervention and replay, with canonical run logs that make claim boundaries and negative results explicit.

Rust / Python · VLA Evals · Intervention / Replay

## NCP

V0.8 RELEASED

NEURAL CONTROL PROTOCOL

Project-agnostic protocol linking neural simulators and AI controllers to robots through four QoS planes, with safety-gated action and per-frame provenance.

Rust · Canonical JSON · Zenoh

## manwe

ALPHA

AIRSPACE PERCEPTION

Research workbench for vision, acoustics, multi-camera geometry and tracking; model exports must pass artifact-identity and numerical gates.

Python · PyTorch · Model Export

## crebain

RESEARCH PROTOTYPE

SPATIAL SITUATIONAL AWARENESS

Unifies Gaussian-splat scenes, native object detection and multimodal 3D tracking in one tactical view for simulated drone operations.

Rust · Sensor Fusion · Native Inference

## melkor

HARDENING

GAUSSIAN-SPLAT INTEGRITY

Inspects and deterministically converts 3D Gaussian splats without a GPU, surfacing numeric hazards and field provenance before pipeline use.

C++ · PLY / SPZ · Asset Validation

## cobot-atlas

PUBLISHED + DOI

OPEN ROBOTICS DATASET

Citable robotics atlas of 2,023 unique GLB meshes, from industrial parts to manipulation objects, with its generation pipeline published alongside the data.

Python · Hugging Face · 3D / VLA

## galadriel

RESEARCH PROTOTYPE

CROSS-SENSOR CONSISTENCY

Fail-closed monitor for sensor disagreement on one track, using per-channel innovation tests and signed correlation over producer-declared projections.

Rust · NIS / CUSUM · Signed Correlation

## haldir

EXPERIMENTAL

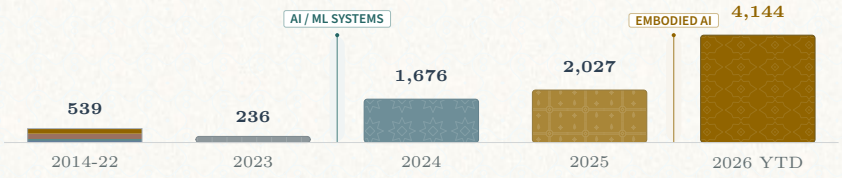
MISSION AUTHORIZATION

Checks signed intents against leases, trusted state and policy; only an allow decision can construct a fresh gate-authored command.

Rust · Authorization · Signed Intents

## PORTFOLIO & ENGINEERING ACTIVITY

| 8,622 | 23 | 93 | 124 |
|---|---|---|---|
| GITHUB CONTRIBUTIONS SINCE 2014 | NON-FORK PUBLIC REPOSITORIES | STARS ON PUBLIC REPOSITORIES | ACTIVE DAYS IN 2026 |




CURRENT MOMENTUM

**2.04×** 2026 YTD contribution volume versus the full 2025 calendar year

4,144 YTD • 2,027 in 2025

CONTRIBUTION BY WEEKDAY


**4,144** contributions • 2026 YTD

| | |
|---|---|
| Mon 16.3% | Tue 13.4% |
| Wed 12.5% | Thu 10.8% |
| Fri 11.4% | Sat 16.9% |
| Sun 18.7% | |

## TECHNICAL SKILLS

AI / ML ENGINEERING

| | |
|---|---|
| • AI SYSTEMS | LLMs / VLMs \| Generative AI \| AI Agents \| Tool Use \| Model Evaluation \| Fine-Tuning / SFT |
| • MACHINE LEARNING | Python \| PyTorch \| Computer Vision \| Multimodal AI \| VLA Evaluation \| Deep Learning |
| • KNOWLEDGE & RETRIEVAL | Knowledge Graphs \| Graph RAG \| RAG \| Embeddings \| Vector Search \| Reranking \| Data Provenance |
| • SYSTEMS & MLOPS | Rust \| C++ \| FastAPI \| ONNX \| TensorRT \| CUDA \| Metal / Core ML \| Docker |
| • CLOUD & INFRASTRUCTURE | GCP \| AWS \| Azure \| Kubernetes \| Terraform \| GitHub Actions \| Linux \| Zenoh |