Takehiro Tsurumi

AI Research Engineer | Multimodal GenAI & MLOps

Takehiro Tsurumi https://tti440.github.io/

Arnhem, Netherlands

+31 627881831

takehiro.tsurumi1031@gmail.com
https://www.linkedin.com/in/takehirotsurumi/ |
https://github.com/tti440 | https://orcid.org/0009-0005-1405-3853

Summary

Early career professional in Artificial Intelligence with experience in ML engineering, computer vision, and generative AI. Skilled in Python, PyTorch, PySpark, and Docker, with a strong focus on reproducible ML pipelines and CI/CD. Award-winning research on bias in Vision Transformers (AIMMES2025 Best Paper, ACM FAccT2025) and practical startup experience building recommendation systems and cloud-based backends. Recognized for strong teamwork and clear communication in interdisciplinary research environments.

Technical Skills

Languages: Python, SQL, C, JavaScript, C#
Tools & Frameworks: PyTorch, Hugging Face, Scikit-learn, OpenCV, Pillow, Django REST, PostgreSQL, FastAPI, Docker, Git, CD/CI, AWS S3, GraphDB, Neo4j
Soft Skills: Cross-functional collaboration, data reporting, teaching & mentoring, reproducibility & documentation, problem-solving

Experience

Vrije Universiteit Amsterdam (VU Amsterdam)
Research Assistant
Sep 2023 – Aug 2025

- Built reproducible experimental pipelines, such as ETL pipelines, following MLOps best practices
- Conducted bias analysis in the interdisciplinary research from both computer vision and linguistics among commercialized models using ETLed datasets (IMDB, CelebA)
- Investigated biases in latent spaces across 10 different architectures (BEiT, Deit, MAE, SWIN, etc.) using iEAT, t-SNE, Grad-CAM, DBSCAN, and SAM2 segmentation; quantified bias at embedding and output layers. (Best Paper Award at AIMMES 2025 and published at ACM FAccT 2025)
- Prepared the experimental environment for bias analysis among Stable Diffuser variants for Bachelor's/Master's thesis
- Integrated Layerwise Relevance Propagation into experimenting transformers to quantify the neural-level reactions to features for bias analysis

- Prepared weekly reports for supervisors and communicated with team members from different fields, documenting progress, problems, solutions, and findings

Vrije Universiteit Amsterdam (VU Amsterdam)
Teaching Assistant
Sep 2023 – Aug 2025

- Supported courses in Programming & Algorithms, Knowledge Graphs & Data, Agent Programming, Conversational Agents, and Modeling.
- Conversational Agents: Guided projects using Whisper, Dialogflow, and MARBEL, enabling teams to design voice-operable ML applications (ASR, NLU, NLG).
- Knowledge Graphs & Data: Assisted with graph construction, reasoning tasks, and data integration using GraphDB.
- Programming & Algorithms: maintained pytest-based testing and runtime evaluation for student assignment evaluation
- Delivered recap lectures, coding demonstrations, and assignment support, strengthening communication and collaboration.

Startup Collaboration: Magicle (Private, NDA)
AI Engineer
Oct 2024 – Mar 2025

- Built the entire ML pipeline for outfit recommendation following MLOps, including CD/CI
- Designed and managed relational databases with PostgreSQL and Django to deal with customer data and data flows to models
- Implemented backend pipelines with Django REST, PostgreSQL, and AWS S3
- Implemented a frontend where users can make any collages using their own apparel items and some stamps inspired by Picsart UI using Django, Vanilla JS, and Tailwind

Waldburg-Zeil Kliniken (Germany)
Data Entry
Sep 2021 – Aug 2022

- Communicated with dietitians about certain restrictions or conditions for patients

UNIQLO (Japan)
Retail Sales Assistant
Sep 2019 – Jan 2021

- Developed teamwork, communication, and organizational efficiency skills in a fast-moving, high-performance environment.
- Contributed to continuous operational improvement through problem-solving and past data.

PASCO (Tokyo, Japan)
Computer Vision Intern
Jan 2018 – May 2018

- Analyzed geospatial and satellite imagery for forest classification, coastline detection, and urban zoning.
- Built and trained CNNs from scratch (e.g., CIFAR10), gaining practical experience in model optimization, learning rates, and experimentation.
- Acquired foundational experience in applying deep learning to real-world datasets, strengthening problem-solving skills in data-driven decision-making.

Education

Vrije Universiteit Amsterdam (VU Amsterdam)
BSc in Artificial Intelligence

Codam Coding College (42 Network)
Software Engineering Program
Focus on C systems development (e.g., mini-shell), peer-reviewed project structure

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Projects & Awards

- **Best Paper Award**, AIMMES2025: *Social Bias in Vision Transformers*
- **Published Paper**, ACM FAccT2025: *Comparative bias analysis across ViT architectures* (tti440/ViTs_Social_Bias_Analysis)
- **Stable Diffusion Bias Evaluation** - designed experiments to assess generative AI fairness across demographic attributes
- **LLM Graph Generation** - built a pipeline for extracting triples and refining ontologies with Neo4j and Ollama
- **Neuron-Level Bias Analysis** - built an experiment pipeline by integrating Attn-LRP on ViT to dissect implicit biases
- **Trip Recommendation Platform (Ongoing)**
  - Developed a Dockerized AI recommendation environment integrating Spark, Neo4j, and Ollama for semantic search and itinerary generation.
  - Designed a multi-agent system using MCP (Model Context Protocol) to enable agentic, context-aware decision-making.
  - Deployed and managed distributed services using Minikube (Kubernetes) for scalable orchestration and testing.
  - Implemented vector similarity search and graph reasoning for ranking and personalized travel recommendations.

Languages & Hobbies

Languages: English (Fluent), Japanese (Native)