

Mengdi Wang

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🐙 Github 🎓 Scholar

🌐 German Permanent Residency

Summary PhD in AI/ML with 3+ years of hands-on experience in AI/ML using Python and PyTorch. Experienced in LLM, VR, Unity, and robotics. Published at AAAI, WACV, PIIEEE, and PACMCGIT. Seeking AI/ML/Data roles

Skills Python, PyTorch, LLM, Unity, C#, Linux, ROCm, CUDA, C++, Docker, ROS2, AI Agent

Education

2022 – now **PhD in AI/ML**, TU Munich

- Research Focus: Distributed collaborative ML, LLM, VR, style transfer
- Technical Responsibilities: Pepper robot programming, VR implementation, server maintenance

2019 – 2022 **Master in Computer Science**, ETH Zurich

2016 – 2019 **Bachelor in Informatics Games Engineering**, TU Munich

Experience

2022 – 2026 **Research Assistant**, TU Munich, HCTL Chair

- 3+ years of hands-on experience in ML training pipelines with Python and PyTorch
- Demonstrated novel federated and split learning algorithms that counteract data heterogeneity and improve model aggregation and scalability. Performance gain up to **30%** and convergence speedup up to **4x** on noisy realistic datasets with non-iid distribution and sparse participation, without incurring any extra client computational burden or data transfer overhead
- Developed novel iris recognition method leveraging style features, demonstrating **2%** higher recognition accuracy and superior robustness against image variation. Accordingly, applied neural style transfer for privacy-preserving iris obfuscation with minimal utility loss and low spoofing risk
- Built real-time LLM-driven interaction system for **Pepper robot** (STT + TTS + joystick control using Choreograph + NAOqi) and improved compatibility and latency, and implemented human pose retargeting via MediaPipe. Deployed in multiple live interaction sessions with children
- Maintained computational server (4x NVIDIA A100 + 1x H200) and 20x workstations (RTX 4080)
- Designed LLM-based VR interaction modules (STT + TTS) in Unity and Mozilla Hubs
- Composed research proposal applying for DFG funding following dissertation topic (proposal granted)

2021 – 2022 **Research Student**, ETH Zurich, Computer Graphics Lab

- Investigated factors influencing 2D-to-3D stylization process using differentiable renderer (PyTorch3D)
- Presented guidelines for style feature decomposition and controlling stroke granularity, and introduced a novel way for per-vertex color initialization to align reshaping and texturing outcomes

Selected Publications

- 2026 **Wang, M.**, Bozkir, E., & Kasneci, E., CycleSL: Server-Client Cyclical Update Driven Scalable Split Learning, *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*
- 2026 Bozkir, E., Özdel, S., **Wang, M.**, David-John, B., ..., & Kasneci, E., Eye-Track Virtual Reality: A Comprehensive Survey on Methods and Privacy Challenges, *Proceedings of the IEEE (PIEEE)*
- 2025 Bodonhelyi, A., **Wang, M.**, ..., & Kasneci, E., Safeguarding Privacy: Privacy-Preserving Detection of Mind Wandering and Disengagement Using Federated Learning in Online Education
- 2025 **Wang, M.**, Bozkir, E., & Kasneci, E., Iris Style Transfer: Enhancing Iris Recognition with Style Features and Privacy Preservation through Neural Style Transfer, *Proc. of ACM on Computer Graphics and Inter. Tech. (PACMCGIT); ACM Symp. on Eye Tracking Res. and App. (ETRA)*
- 2025 **Wang, M.**, Bozkir, E., & Kasneci, E., Trade-Offs in Privacy-Preserving Eye Tracking through Iris Obfuscation: A Benchmarking Study, *International Conf. on Digital Signal Processing (DSP)*
- 2024 **Wang, M.**, Bodonhelyi, A., Bozkir, E., & Kasneci, E., TurboSVM-FL: Boosting Federated Learning through SVM Aggregation for Lazy Clients, *AAAI Conference on AI (AAAI)*

Projects

- 2025 – 2026 **Video-SRS**: video-based user disengagement detection
- Improved performance and privacy preservation of video-based (face and eye tracking) user disengagement detection using webcam via federated learning algorithms
 - Generated videos using StarGAN and VLMs for data augmentation and guided students
- 2025 – 2026 **Telephone Game with LLMs**: investigation of semantic drift in LLM inference chain
- Guided students and simulated telephone game with LLMs (chain of LLM inference in form of recursive describe-and-guess with fresh instance each time), investigated impact of word abstractness and frequency, model size and quantization, and prompt structure on semantic drift
- 2022 – 2023 **HCTL VR Hub**: web-based multi-player VR environment for career guidance
- Built multi-player web-based VR environment in Mozilla Hubs for LLM-based (STT + TTS) career guidance and deployed on AWS EC2
 - Finetuned LLMs using data scraped from IHK to improve LLM output
- 2021 **CloudVis**: Unity-based large-scale meteorological cloud data interactive visualization
- Simulated large-scale atmospheric processes (air pressure and temperature, air flows, humidity, ...) in Unity with real-time first-person perspective game-like interaction
 - Implemented customized shaders to support visualization of volumetric data and vector fields
- 2018 **Kings of Dominia**: Unity-based multi-platform touchscreen video game
- Designed multi-platform touchscreen video game emulating the physics-based domino toppling game

Others

- Languages Chinese (native), English (C1), German (C1), Japanese (beginner)
- Teaching Human-AI Interaction (exercise), Introduction to Programming and Data Processing (lecture), Serious Games in Extended Reality (exercise), Recent Advances in Privacy (seminar)