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Technische Hochschule Ingolstadt

Write you Master Thesis with us!

Evaluation of Reinforcement Learning Agents to Enhance Human Training Performance

Reinforcement Learning (RL) Agents exceed human performance in many different tasks in digital environments. This thesis addresses the question if humans can benefit from these agents with superior task performance by actively learning from their actions and state representations. With the goal of using RL agents to train humans, this thesis also touches on the challenge of RL agent transparency in decision-making. Trained agents often function as black boxes, providing limited insight into how and why agents do certain actions during their learning and decision-making processes.

Image source [1]

Your tasks

- Review the literature about the usage of (RL-) agents as tutors for human users
- Develop a technical concept for the improvement of human training
- Implement a game-like simulation environment that can be used to train a RL agent but also be played by humans
- Empirically evaluate different approaches to train the human based on the learned agent knowledge

Image source [2]

Your Profil

- Studying Computer Science/Engineering (HCI, HMI)
- Interest in human-centered use of AI
- Experience in Python/C++
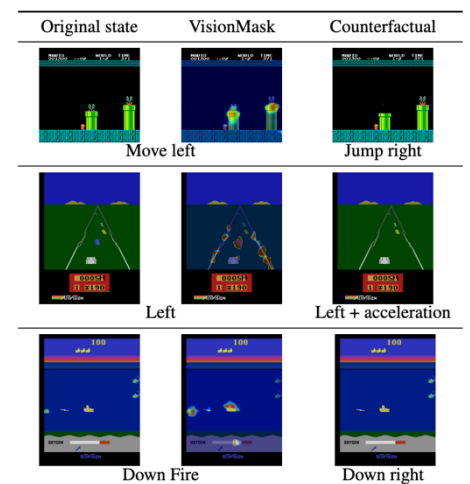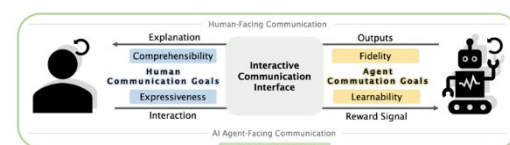- Experience in Reinforcement Learning (optional)

Kontakt

Prof. Dr. Simon Schwerd
simon.schwerd@thi.de
Tel.: +49 841 9348-6417

Diah A.I. (M.Sc.)
Diahayu.irawati@thi.de
Tel.: +49 841 9348-5209

Technische Hochschule Ingolstadt
Technologietransferzentrum
Unbemannte Flugsysteme

[1] Metz, Y., Lindner, D., Baur, R., & El-Assady, M. (2024). Mapping out the Space of Human Feedback for Reinforcement Learning: A Conceptual Framework. *arXiv*. https://arxiv.org/abs/2411.11761
[2] Zuo, R., Wang, Z., Khan, S., Katz, G. E., & Qiu, Q. (2024). Why the Agent Made that Decision: Explaining Deep Reinforcement Learning with Vision Masks. *arXiv*. https://arxiv.org/abs/2411.16120