SETLabs Research is a Munich-based research center founded in 2021 as a subsidiary of Virtual Vehicle Research GmbH in Graz, Austria. SETLabs partners with academia and industry for joint projects to enable knowledge transfer from basic and applied research into real-world applications. The center has domain-open expertise in modeling and simulation, hardware/software integration, systems engineering, machine learning, and artificial intelligence. The main research is conducted according to technologies within healthcare and mobility sectors.

Master Thesis

"NLP based knowledge representation and instructional prompting for socially aware robots"

Future autonomous robots in the clinical and healthcare environment should seamlessly integrate into the work environment through a variety of service, monitoring, and human-robot interaction tasks. This requires - beyond the navigation in indoor environments - the awareness of the presence and social interaction with and among humans, including an understanding of their individual characteristics.

Your Tasks

- Perform state-of-the-art research on NLP based knowledge representation and instructional prompting for collaborative robotics (industrial, service, and social robotics).
- Develop methodology for scene understanding and knowledge representation using NLP-based prompting adapting existing perception interfaces (object-list and occupancy gridmaps).
- Develop method(s) for interactive knowledge injection through human instructors, e.g. during robot operation or human-robot interaction.
- Develop prompts for reporting scene detection after repetitive perception input.
- Connect to simulation and teaching environment in Unity.
- Demonstrate learning and adaptation capabilities in a simple experimental scenario.
- Evaluate quantitatively and qualitatively the results of your implementations, both in simulation and real-world application (available robotic platform(s): Double Robotics Double 3).
- Provide documentation of your work in form of a scientific publication and conference presentation.

Literature

Jiang, Y.,... & Fan, L. (2022, November). Vima: General robot manipulation with multimodal prompts. In *NeurIPS 2022 Foundation Models for Decision Making Workshop*.

Singh, I., ... & Garg, A. (2023, May). Progprompt: Generating situated robot task plans using large language models. In *2023 IEEE International Conference on Robotics and Automation (ICRA)* (pp. 11523-11530). IEEE.

Lynch, C., ... & Florence, P. (2023). Interactive language: Talking to robots in real time. *IEEE Robotics and Automation Letters*.

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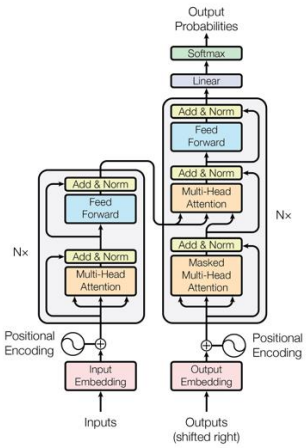
Your Profile

- Student currently enrolled in MSc. Informatics / Robotics / Electrical Engineering or similar.
- Enthusiasm to do research in the area of generative AI at the intersection with robotics.
- Required: Solid Python programming skills. Good to know: Unity + C# programming skills, ROS, RViz.
  Preferably good understanding of state-of-the-art methodology in generative AI, specifically Transformers and Graph neural networks.



Our Offer

- Exciting international projects with a broad partner network.
- Collaboration within an engaging and dynamic team.
- Flexible working hours and possibility to work remotely.
- Paid master's thesis and mini job employment possible.
- Participation in scientific conferences.
- Personal and professional development opportunities on any career level.
- Possibility for follow-up dissertation.

Contact for Application:

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Virtual Vehicle Research GmbH, the 100% parent company of SETLabs Research GmbH, processes your application on behalf of SETLabs Research GmbH. For further information please see our Data Protection Notice.

If you consent that your submitted data is also stored in our talent pool for up to one year after the last contact with you, please let us know by e-mail.

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