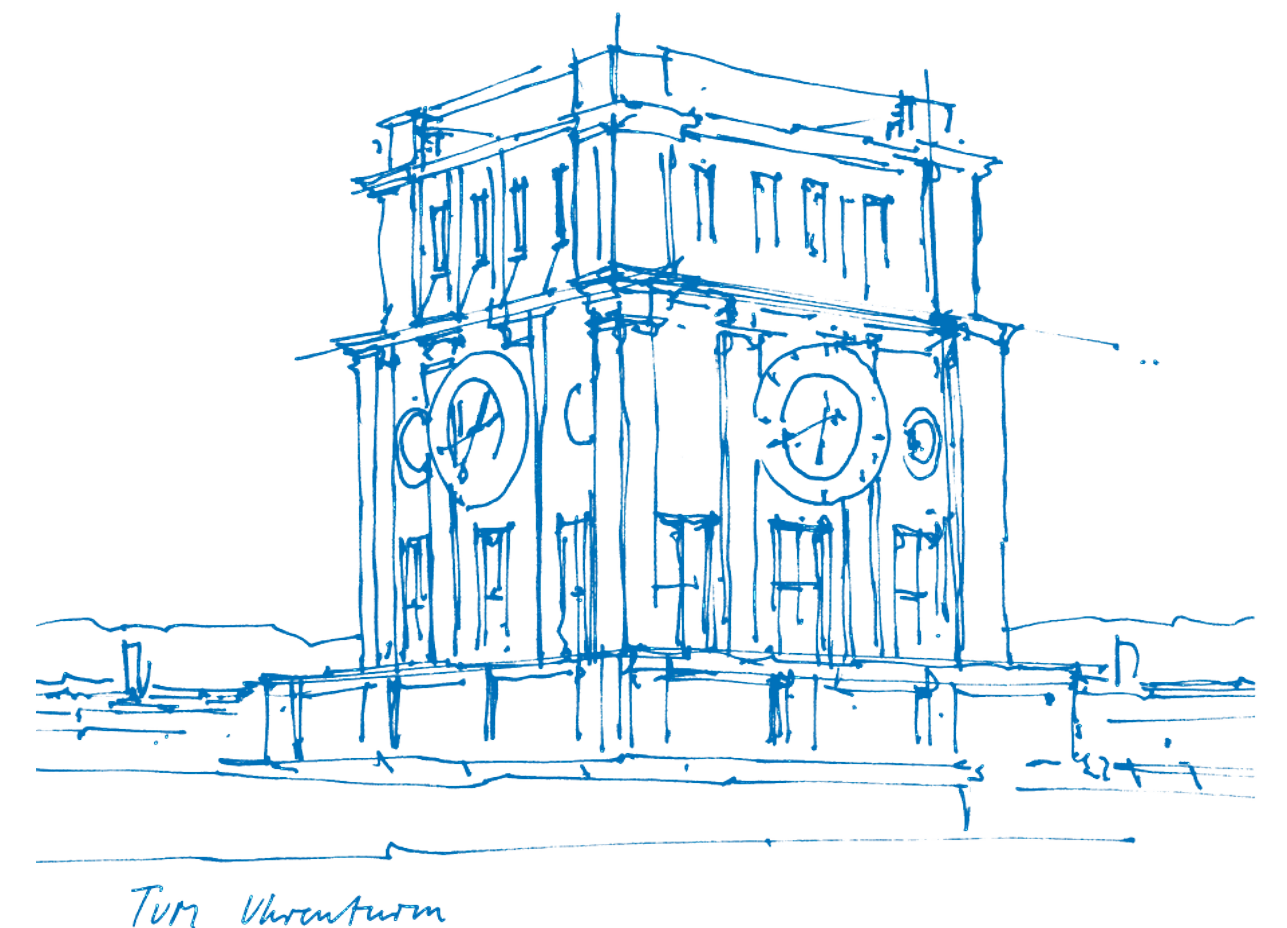


Deep Learning for Spatial AI

Preliminary meeting

Nikita Araslanov, Linus Härenstam-Nielsen, Dominik Schnaus, Weirong Chen, Ganlin Zhang, Shenhan Qian

10.02.2025



What is Spatial AI?

- The capacity to navigate and interact with the environment
 - **Geometric perception:** What is the underlying 3D structure?
 - **Semantic perception:** What is the underlying 3D structure?
- 3D reasoning
 - Recovering 3D structure (e.g. from videos / image collections)
 - Leveraging 3D structure for semantic reasoning

Course advisors



Dr. Nikita Araslanov



Linus Härenstam-Nielsen



Weirong Chen



Dominik Schnaus



Ganlin Zhang



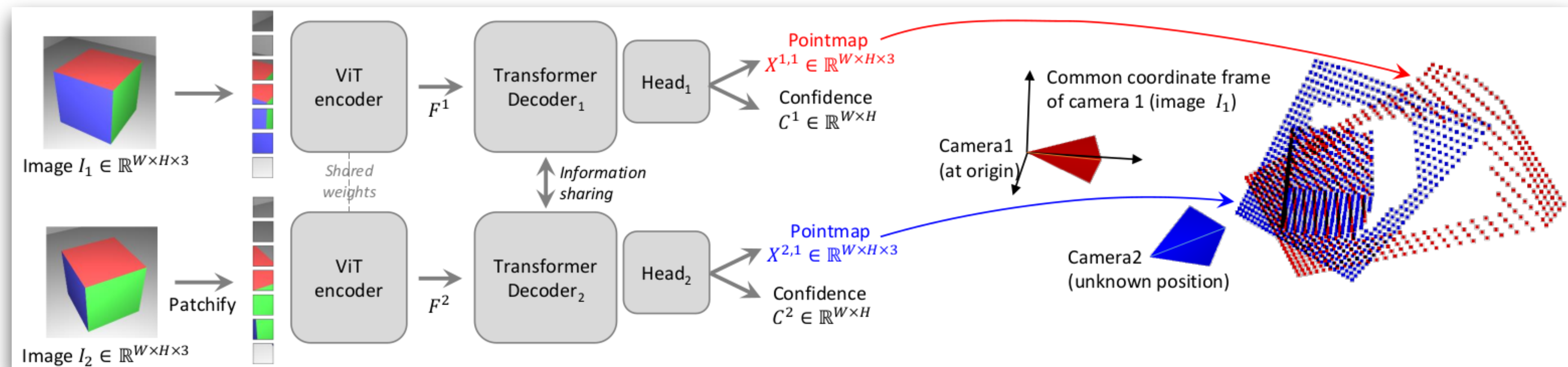
Shenhan Qian

You reach us over the mailing list: dl4sai-ss25@vision.in.tum.de

Previous projects (1)

DUST3R SLAM (Advised by Linus Härenstam-Nielsen and Weirong Chen)

DUST3R



Wang et al., (2024)

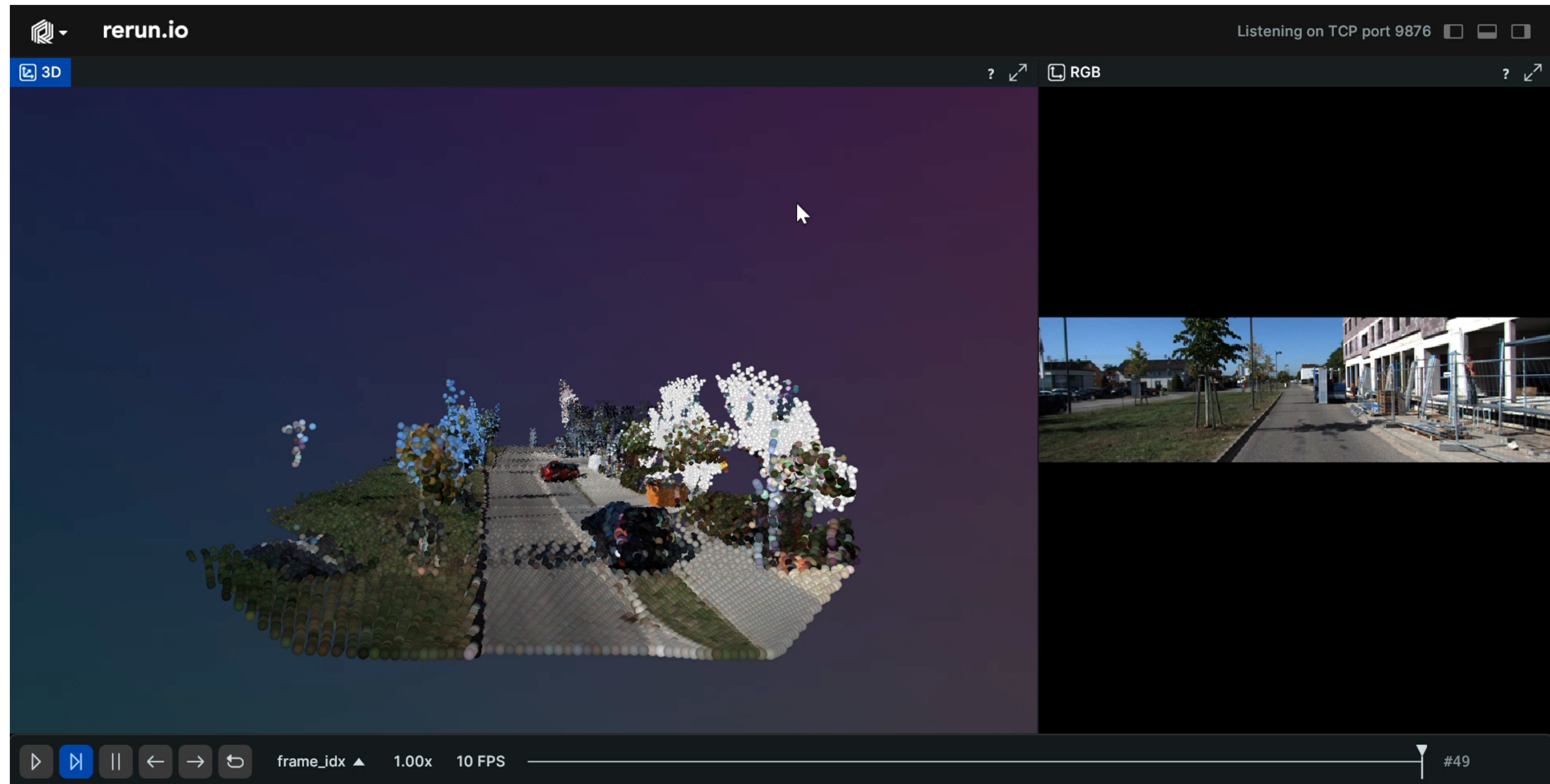
Previous projects (1)

DUST3R SLAM



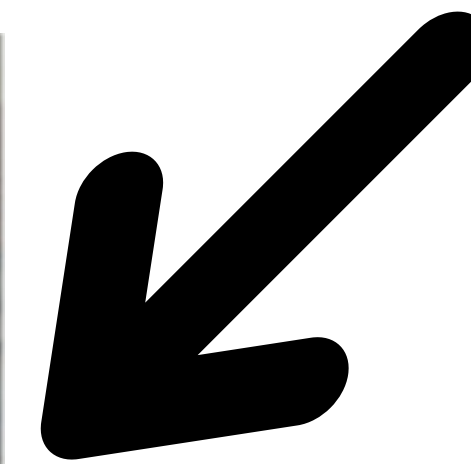
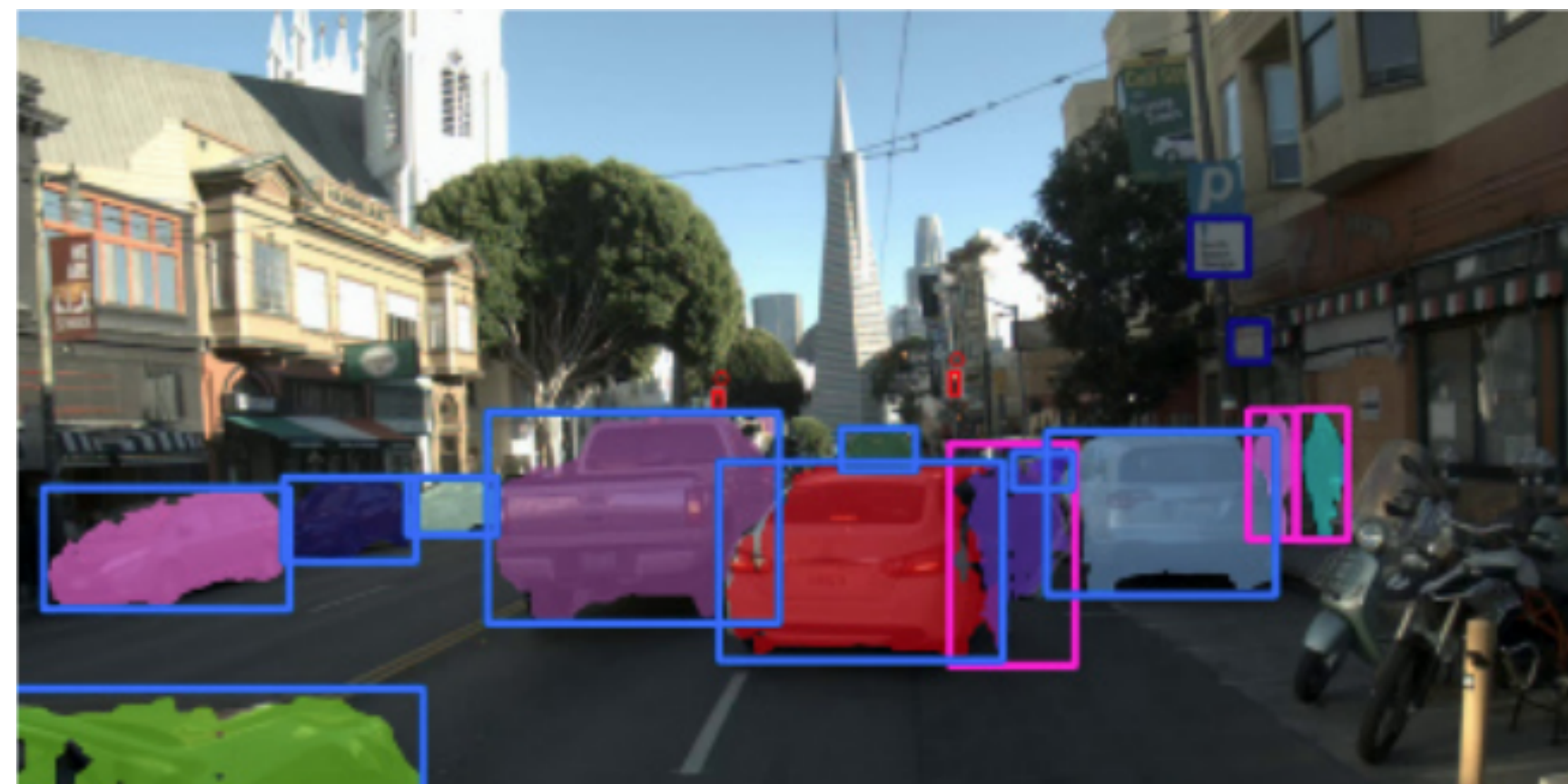
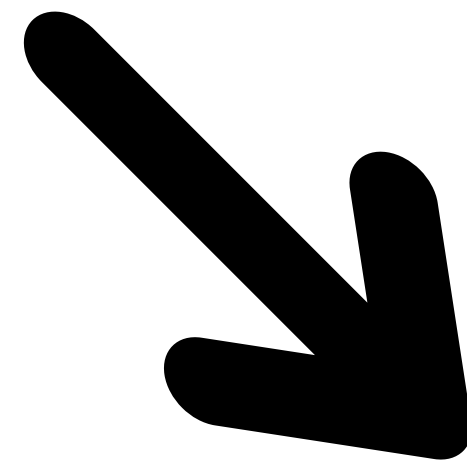
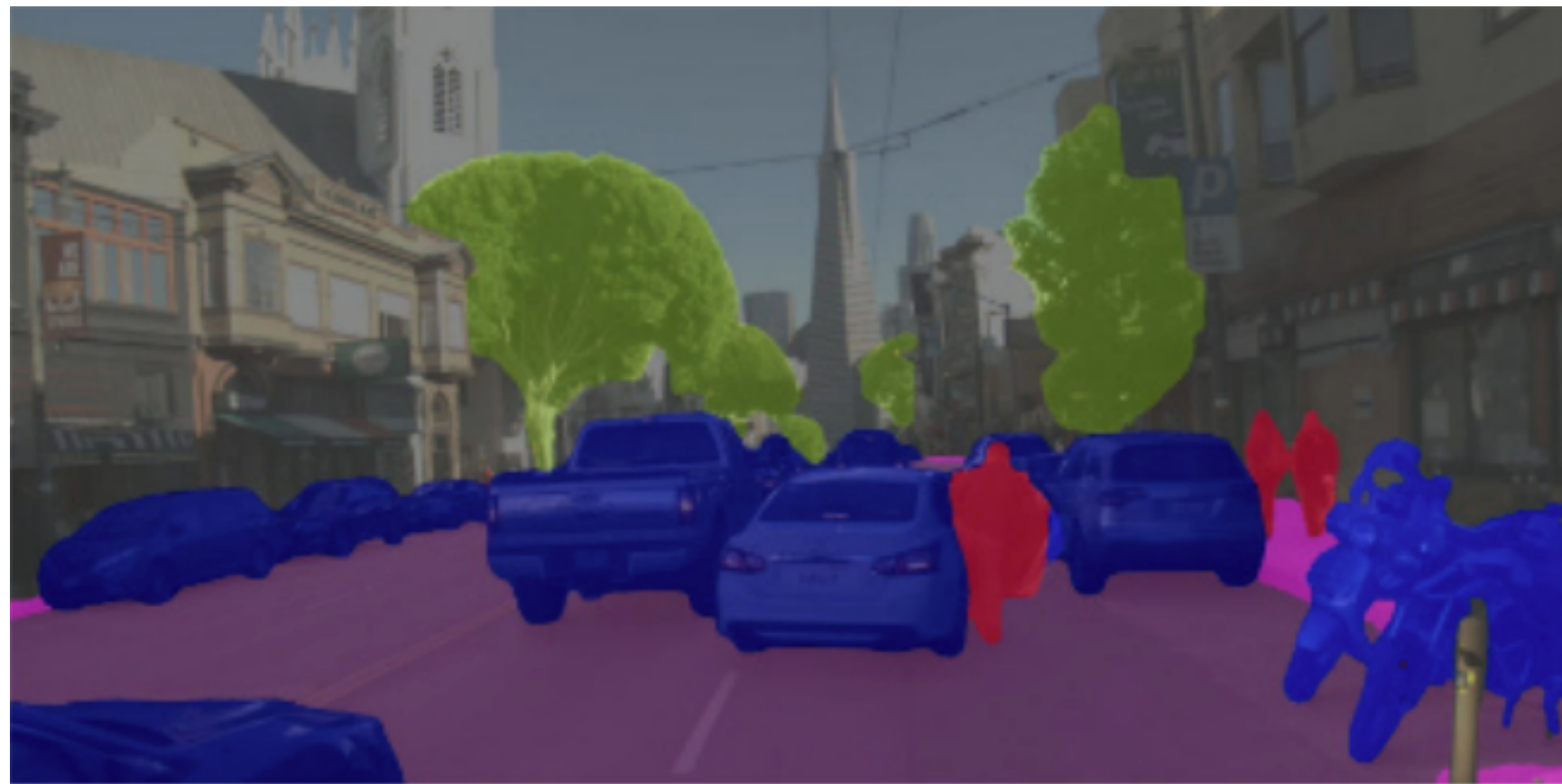
Advised by Linus Härenstam-Nielsen and Weirong Chen

Previous projects (1)



Previous projects (2)

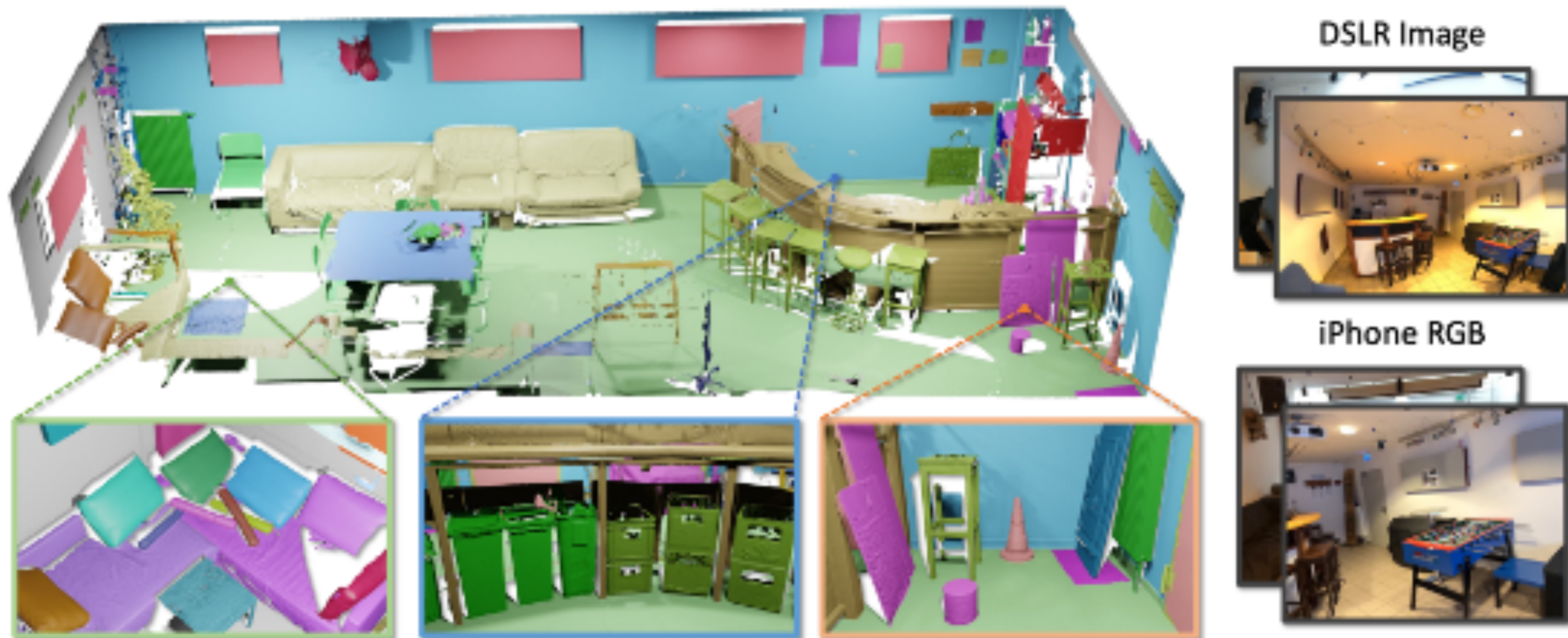
Self-supervised instance segmentation using depth Information



Advised by Dominik Schnaus

Previous projects (3)

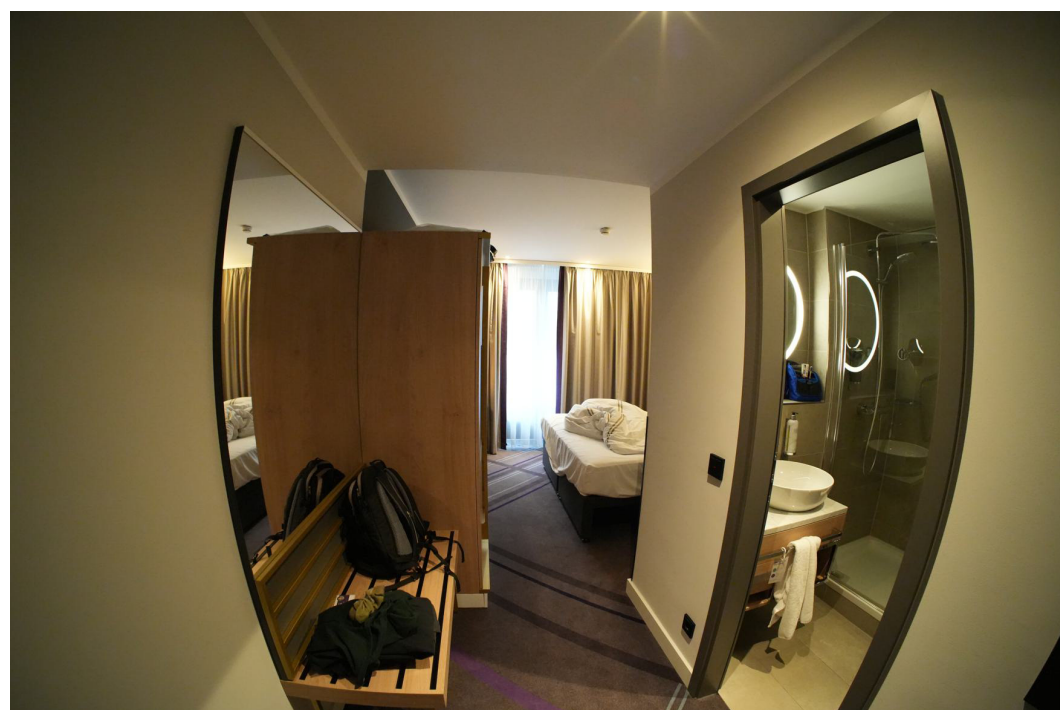
Dataset: Scannet++ (Yeshwanth et al., 2023)



Advised by Zhenzhang Ye and Nikita Araslanov

Previous projects (3)

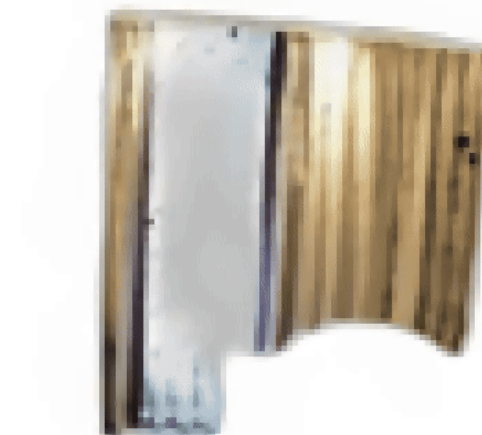
DSLR image



Extracted input



Pre-trained

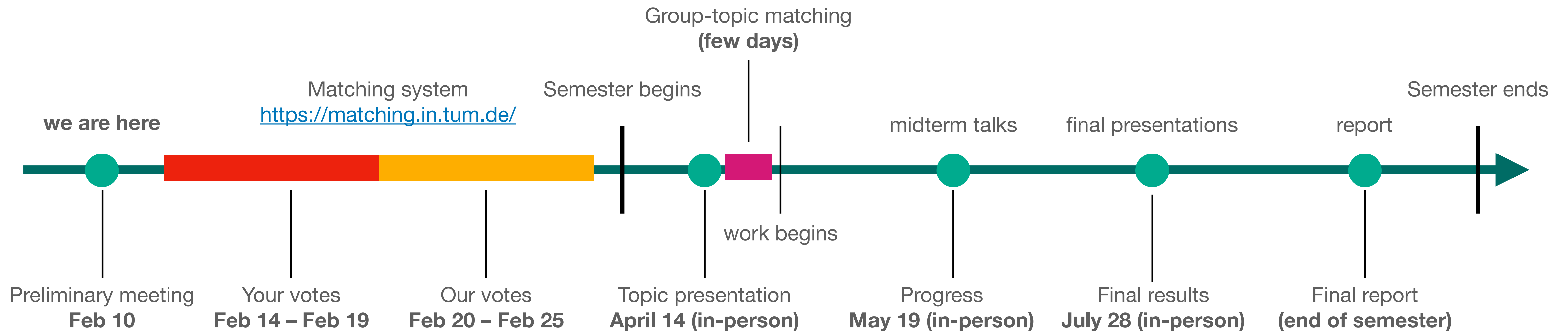


Advised by Zhenzhang Ye and Nikita Araslanov

What we expect

- Prerequisites:
 - ▶ Introduction to Deep Learning (IN2346)
 - ▶ Computer Vision II: Multi-view Geometry (IN2228)
- or any other relevant courses:
 - ▶ Computer Vision III (IN2375)
 - ▶ Machine Learning for 3D Geometry (IN2392)
- unsure → send us an email (dl4sai-ss25@vision.in.tum.de)

Timeline



- Send us your application (transcripts) by February 20.
- Projects are assigned to groups of 2-3 people.
- Reports are due by the end of the semester.

Summary

What you get:

- Interesting research problems.
- Teamwork in a group of 2-3 people.
- Regular group meetings (e.g. weekly) with an advisor.
- Access to a GPU cluster.

What you give:

- two presentations (midterm and final);
- written project report.

Contact: dl4sai-ss25@vision.in.tum.de

Course webpage:

<https://cvg.cit.tum.de/teaching/ss2025/dl4sai>

Next steps

- February 14–19** Apply for the course via Matching System
- until February 20** Send us your CV / Transcripts
- April 14** Topic presentation