Recent Trends in 3D Computer Vision (RT3DCV)

Pre-course meeting - Summer semester 2025

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Tutors: Nikolas Brasch, Markus Herb, Sen Wang, Kunyi Li, Felix Tristram, Klara Reichard, Changxuan Li, Christian Kapeller, Nils Morbitzer, Ege Özsoy, Mert Kiray, Abdelrahman Elskhawy, Andrea Ramazzina, Artem Savkin

Goals

- You are going to learn:
  - about the state of the art in Computer Vision and Deep Learning
  - about current challenges in 3D vision research and its applications

- And also:
  - how to read and understand scientific articles
  - how to give a tech talk to an audience, and related Q&A

Seminar contents

- The seminar includes a selection of the most recent and relevant works in the field of computer vision and deep learning for 3d perception
  - Object Detection and Tracking
  - Object / Human / Camera Pose Estimation
  - Panoptic Segmentation
  - Object & Scene Reconstruction / Completion
  - Generative Shape Synthesis / Novel View Synthesis
  - SLAM / Structure-from-Motion

Seminar Schedule

- 4-5 sessions (Fridays 2 - 4 pm) + 1 introductory lecture
- 4 presentations per session
- In-person attendance is mandatory
  - Need to provide reason for missing a class (e.g. doctor’s note, proof of important scheduling conflict, etc.)
- Joined BSc and MSc seminar
  - Start with overview of **broader recent trends** in the field of 3D CV (BSc)
    - Goal: Get an overview of well established impactful paradigms or tasks
    - Leverage diverse materials from publications, blogs, tutorials
  - Continue with **recent papers** pushing the state-of-the-art forward (MSc, BSc)
    - Based on very recent paper and it’s related works

Tentative Schedule (dates might still change)

Date & Time	Topic
23.04.2025	Semester Start
25.04.2025 14:00-16:00	Introductory Meeting
27.06.2025 14:00-16:00	Presentations 1 - 4
04.07.2025 14:00-16:00	Presentations 5 - 8
11.07.2025 14:00-16:00	Presentations 9 - 12
18.07.2025 14:00-16:00	Presentations 13 - 16
25.07.2025 14:00-16:00	Backup
25.07.2025	Semester End

Seminar Schedule

- Paper assignments:
  - We provide a list of topics & papers
  - Students can express their preferences
  - Conduct matching trying to maximize global happiness
- Preparation
  - Every paper has a tutor assigned to it
  - Student should start discussion with the tutor early to ask questions about the paper and get feedback for the presentation
  - Usually 1-3 meetings in the weeks before the presentation date

Presentation

- Each presentation is 15 - 20 minutes + 5 minutes for Q&A
- The presentation should cover all relevant aspects of a scientific work
  - Introduction and state of the art
  - Main contribution(s)
  - Experimental results
  - Discussion, authors & personal summary and future work
- The presentation should be self-contained
- We provide a template for the slides, but you can also use your own favorite

Feedback

- We will ask everyone to give feedback for some of the presentations
- We will anonymize the feedback and forward it to the presenter
- The presentations will be recorded so you can later review your own presentation with the feedback

Evaluation criteria

- Quality of the presentation
  - **Quality of the talk (40%)**
    - Technical quality (grasp of the paper & condense technical contributions)
    - Presentation style (pace & tone)
    - Language (audible, clear sentences)
  - **Quality of the slides (40%)**
    - Layout (clean, not overloaded, not too much text)
    - Completeness (e.g. intro, sota, contributions, results, summary, outlook)
    - Figures
    - Citation style
  - **Q&A (20%)**
    - Preparation and understanding of the topic
  - Timing (We will stop you at +2 mins, so parts of the talk might be missing)
    - Not longer, but also not much shorter than the given time limit
- **Interaction with the tutor (+10%)**
- **Participation in the Q&A of other talks & feedback (+10%)**
- Different expectations for BSc and MSc in terms of scientific depth and presentation experience

Application

- Register your choices via TUM matching system
- To increase your chances you are encouraged to submit a motivation letter to:

  rt3dcv@camp.cit.tum.de

- Relevant information
  - Name and email
  - Motivation to take the course
  - Previous experience in the field of CV & DL (courses, projects, …)
  - Latest CV (not mandatory)
  - Transcripts of records (not mandatory)
- **Deadline 19.02.2025**

Any questions?

(These slides can be found on the course website after the meeting)