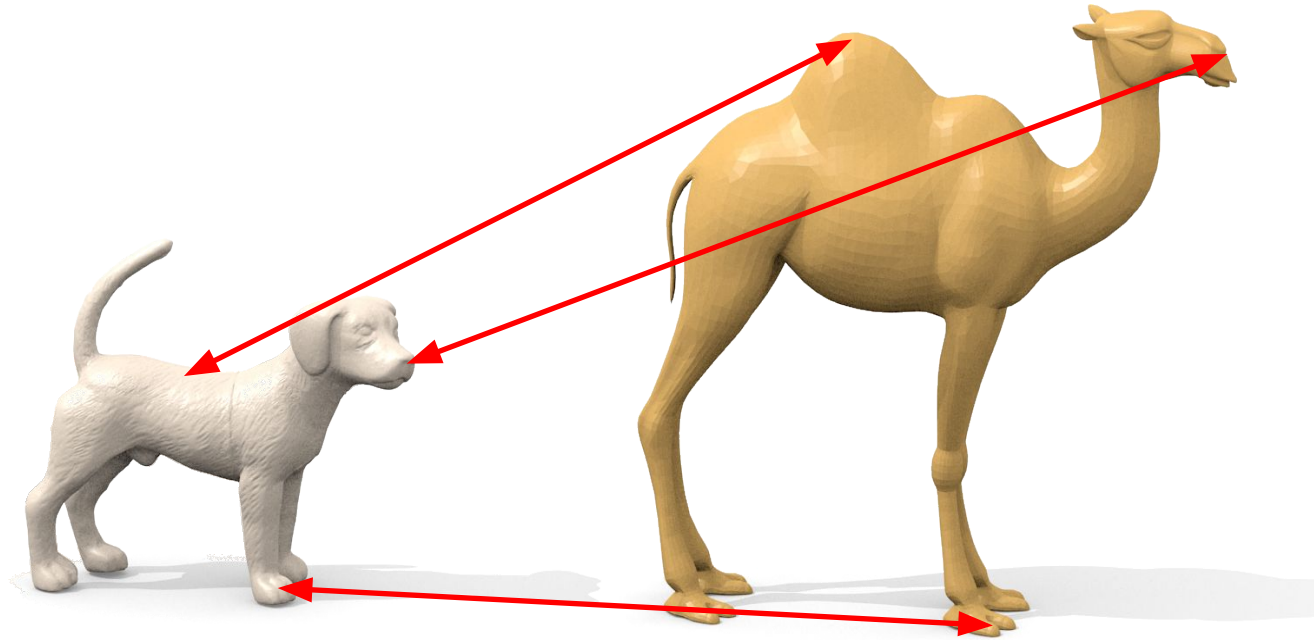# Seminar: 3D Shape Matching and Applications in Computer Vision
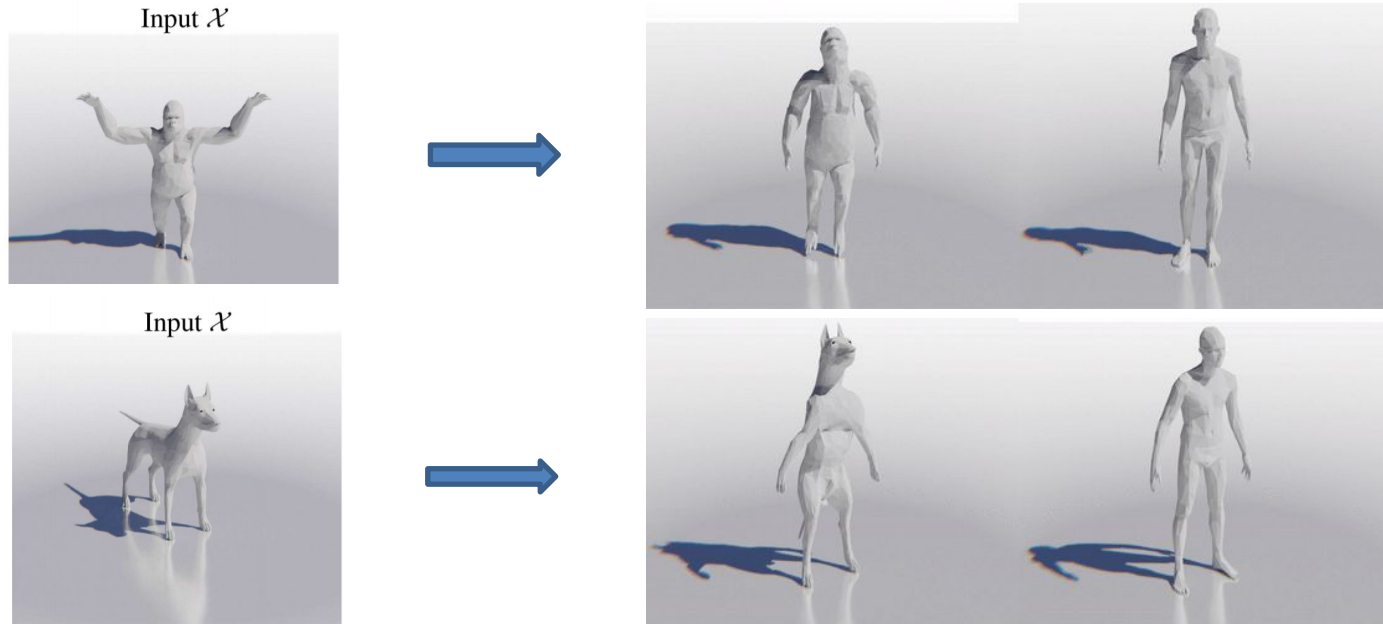
Preparation Meeting, 12.07.2023

Viktoria Ehm, Maolin Gao

Seminar: 3D Shape Matching

Seminar: 3D Shape Matching

Input $\mathcal{X}$

Input $\mathcal{X}$

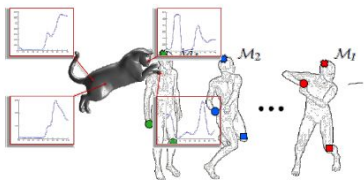Eisenberger et al

Seminar: 3D Shape Matching

Wonder Studio

Organisation

Block seminar: **26 - 27.09.2023** (maximal 2 days)

Place: **Hybrid**, room 02.09.023 & online (zoom link see tumonline)

Website: https://cvg.cit.tum.de/teaching/ws2023/3dsm

Email: 3dsm-ws23@vision.in.tum.de

What you will learn

Get an overview on recent research in
3D Shape Matching and Applications in
Computer Vision
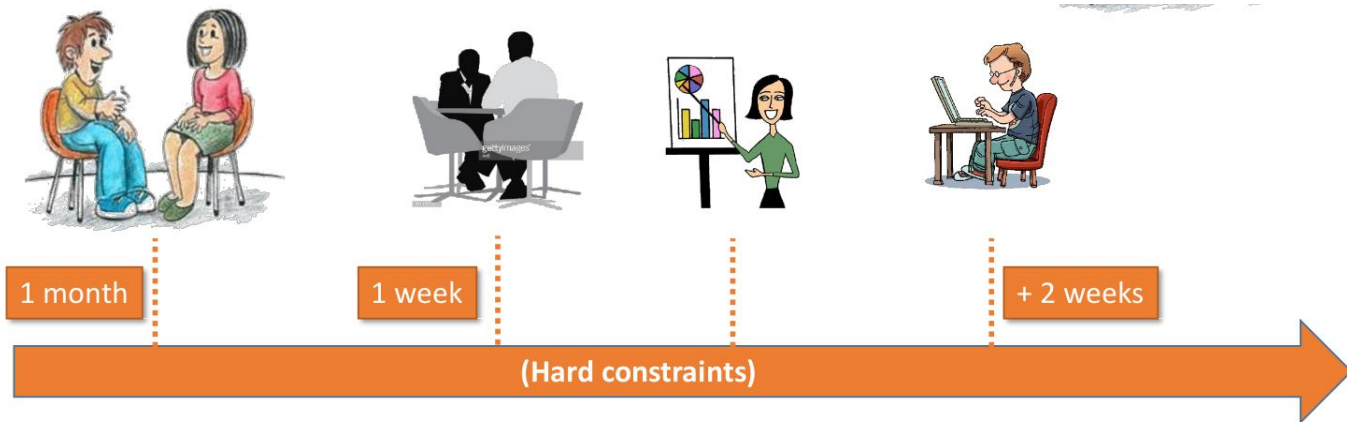
Read and understand scientific publications
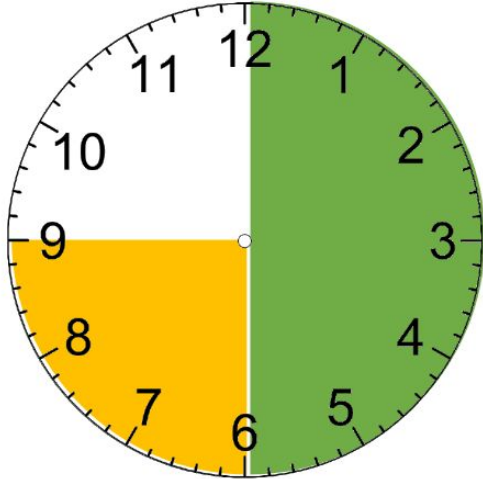
Prepare and give a talk

Write a scientific report

Preparation

- You do not need to (and should not) work on your topic alone

- Meet at least twice with your supervisor

- It is your responsibility to contact your supervisor for these meetings

1 month   1 week   + 2 weeks

(Hard constraints)

Presentation

Recommended structure
1. Introduction of the problem
2. Approach
3. Results (if any)
4. Summary

- 30 minutes talk + 15 minutes discussion

- use visualizations

- number your slides

- do not make slides full of text

- explain things you had problems understanding when first reading your paper in more detail

- reference the original author and conference/journal name

Report

- The report is due 2 weeks after the talk and gives you the chance to **make up for questions that were left**

- **Address the open questions left from the Q&A session.**

- Not a copy of your assigned material, **focus on parts that you found interesting or concepts you had to do additional work to understand**

- 6-10 pages

- Use CVPR Latex template:
  https://media.icml.cc/Conferences/CVPR2023/cvpr2023-author_kit-v1_1-1.zip

- Use your text editor of choice if you must but keep the style similar to the template

Evaluation Criteria

- Attendance on the block seminar day is necessary!
  Contact us **beforehand** if you have other appointments.

- Participation (questions, discussions) influences the final grade.

- Final grade will be a weighted combination of your presentation, participation and report.
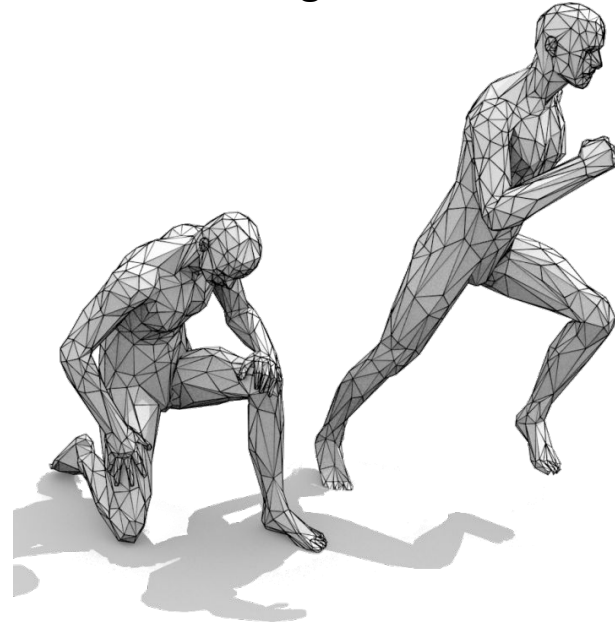
General Tips

- Choose the main aspects and interesting subtopics

- Understand them in every detail

- It may be necessary to check related articles or textbooks

- **Prepare the topic such that it is understandable to the other participants of the seminar**
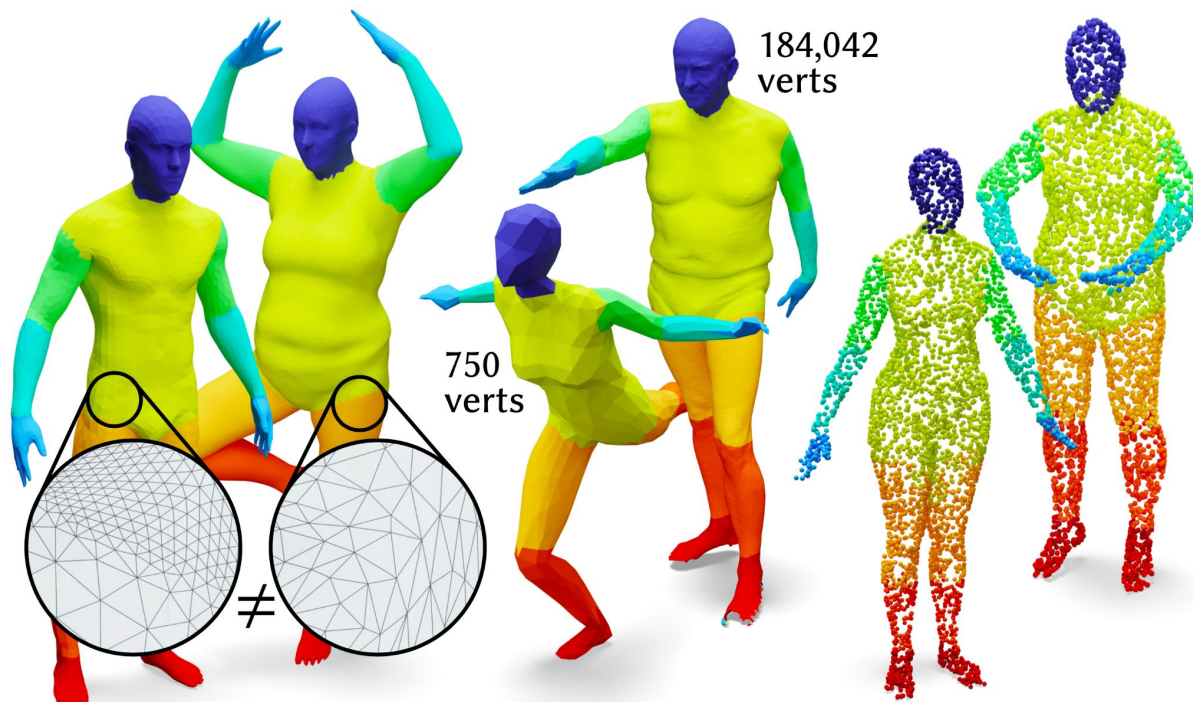
Data Structure

Point cloud

Triangular mesh

Seminar: 3D Shape Matching
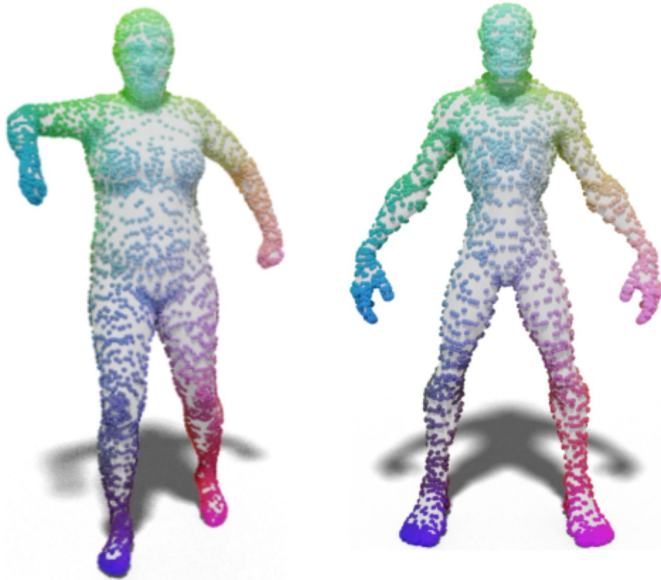
1.DiffusionNet: Discretization Agnostic Learning on Surfaces
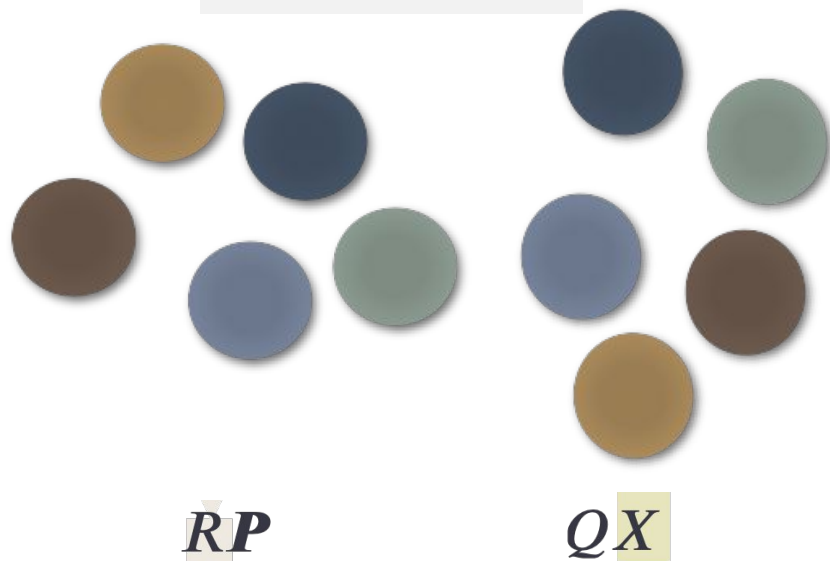
Sharp et al. 2022

184,042 verts

750 verts

≠

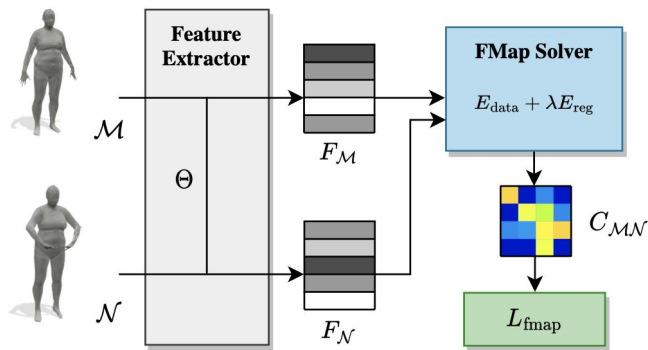# 2. Point Clouds Registration Via Efficient Convex Relaxation

Haggai et al. 2016
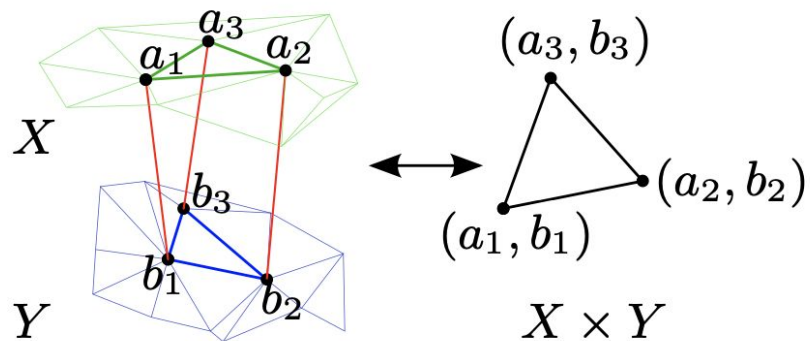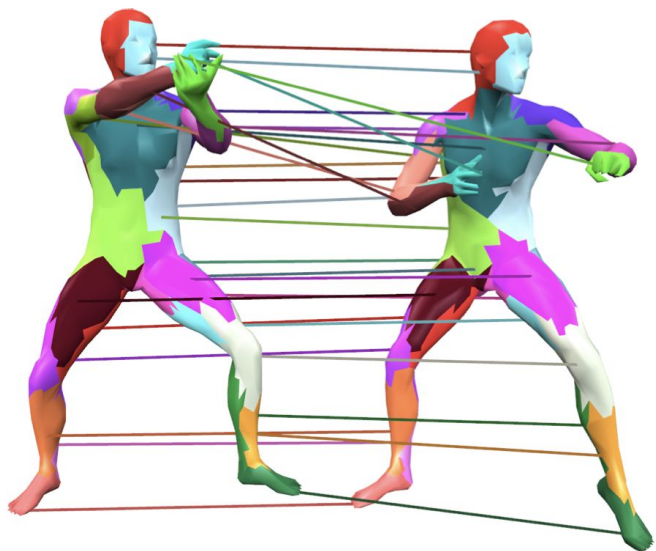
$$\|RP - QX\|$$

RP

QX

3. Unsupervised Learning of Robust Spectral Shape Matching

Cao et al. 2023

4. Dense Elastic 3D Shape Matching

Schmidt et al. 2014

Registration

- Computer Science & exchange students apply through the TUM Matching platform (matching.in.tum.de)

- There are 12 places in total

- Everyone present at the premeeting gets priority in the matching system, please post your **name, TUM-Kennung and email in the chat in one message**

Assignment of Topics

- A list of topics will be available on the homepage in the upcoming weeks

- https://cvg.cit.tum.de/teaching/ws2023/3dsm

- If you got assigned to this seminar, send us an email to 3dsm-ws23@vision.in.tum.de with your **four** favorite topics

- Topics will be assigned by first come first serve

Questions?