Seminar:

Shape Analysis and Applications in Computer Vision

Preparation Meeting, 03.02.2021
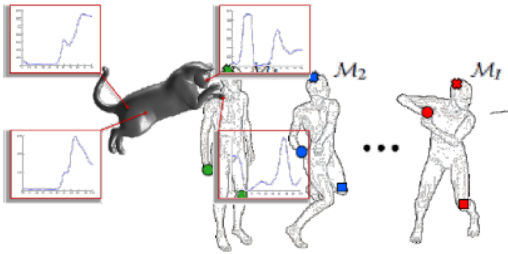
Florian Bernard, Marvin Eisenberger, Zhenzhang Ye

Block Seminar

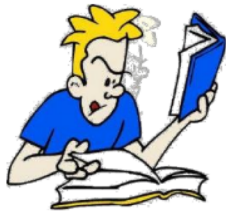**Dates**: between April 07 and April 09 (full day or half day, tbd)

Place: virtually on Zoom

Timeline: its highly recommended to start meeting with your supervisor one month before the presentations (beginning of March). The report is due two weeks after the presentations (**April 23**).

What you will learn

Get an overview on recent research in 3D Computer Vision

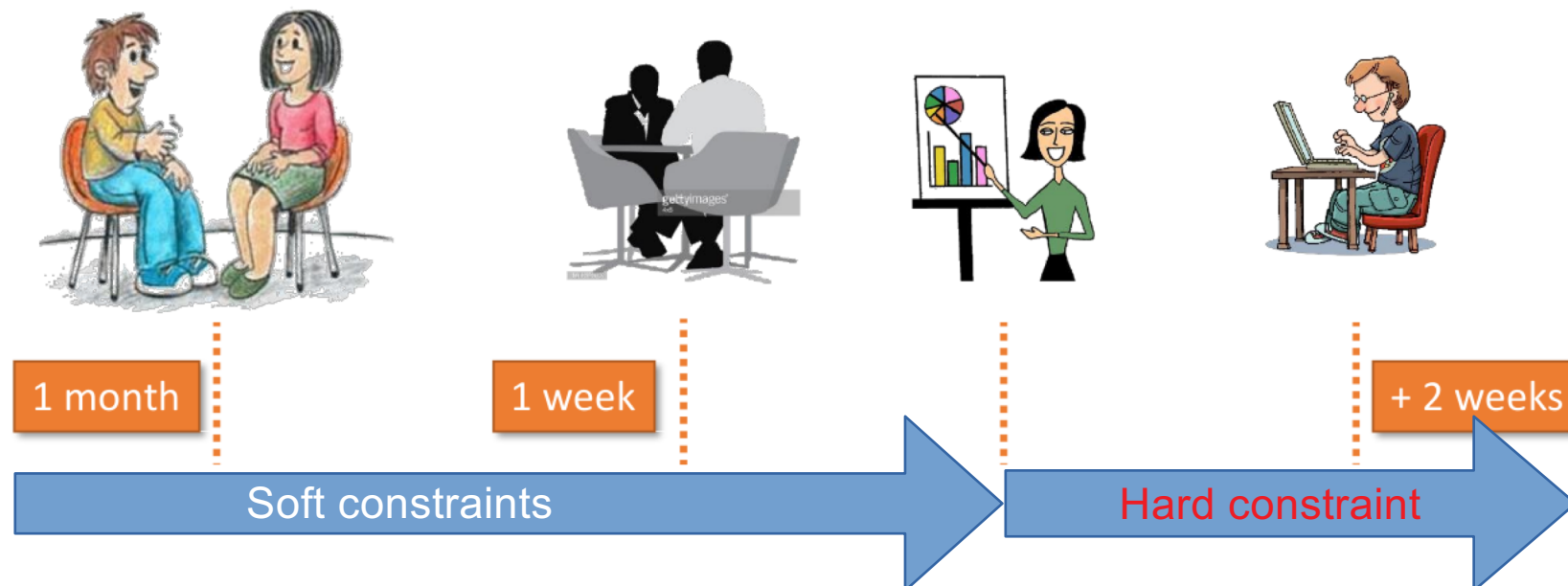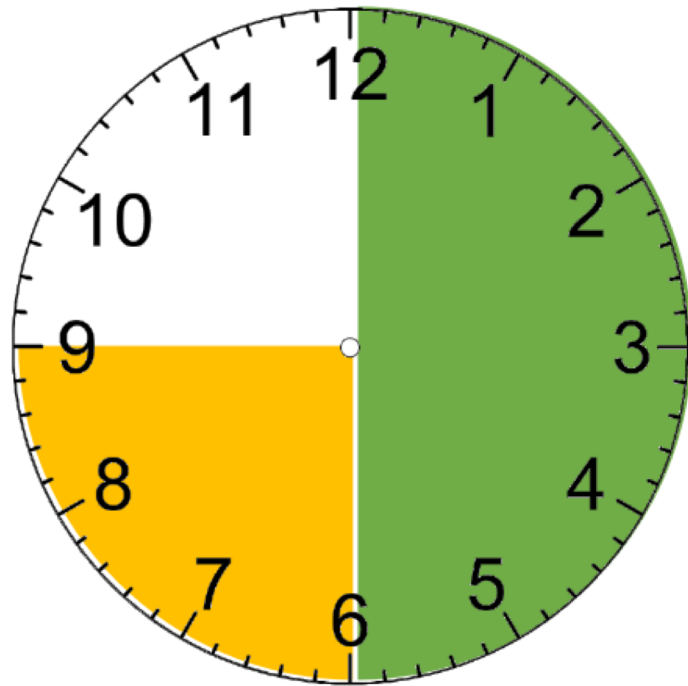Be able to read and understand scientific publications

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

Soft constraints

Hard constraint

Presentation

- 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

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

Report

- Overview and main contributions of the assigned topic

- Not a copy of your assigned material, focus on parts that you found interesting but discuss them more in-depth or concepts you had to do additional work to understand

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

- 6-10 pages

- Use CVPR Latex template: http://cvpr2021.thecvf.com/sites/default/files/2020-09/cvpr2021AuthorKit_2.zip

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

Evaluation Criteria

- Attendance at each meeting is necessary! Contact us **beforehand** if you have other appointments.

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

- Report and presentation should be more detailed than the original paper

a. Choose the main aspects and interesting subtopics

b. Understand them in every detail

c. It may be necessary to check related articles or text books

d. Prepare the topic such that it is understandable to the other participants of the seminar

Topic Overview (tentative)

- Convex Global 3D Registration with Lagrangian Duality
- Point Registration via Efficient Convex Relaxation
- MINA: Convex Mixed-Integer Programming for Non-Rigid Shape Alignment
- Deep Learning of Graph Matching
- Higher-order Projected Power Iterations for Scalable Multi-Matching

- Divergence-Free Shape Correspondence by Deformation
- Geometric Modeling in Shape Space
- Geodesics in Heat
- Deep Functional Maps: Structured Prediction for Dense Shape Correspondence
- Occupancy Networks: Learning 3D Reconstruction in Function Space

- Sinkhorn Distances:Lightspeed Computation of Optimal Transport
- GFrames: Gradient-Based Local Reference Frame for 3D Shape Matching
- Learning Combinatorial Solver for Graph Matching
- Determinant Regularization for Gradient-Efficient Graph Matching
- Deformation-Aware 3D Model Embedding and Retrieval
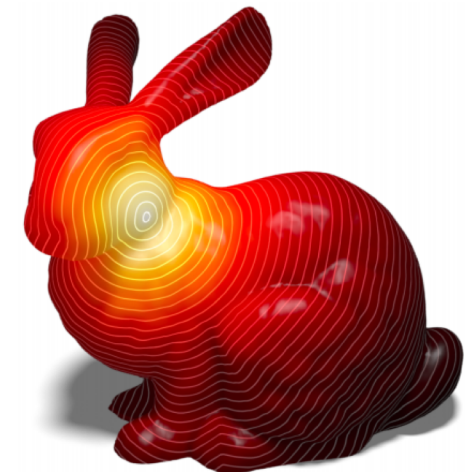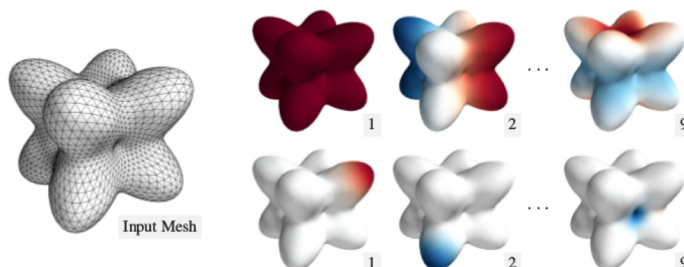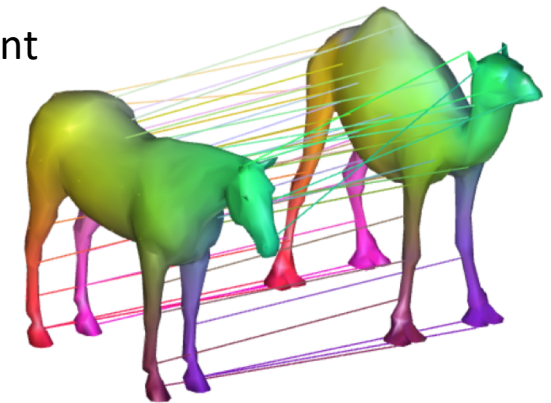
Choose your own topic

- Have a paper related to 3D computer vision that you are really interested in and want to present in this seminar?

- Send us your paper after you were matched with this seminar and we will let you know if its an acceptable topic. (Of course we might not be able to help that much with the details.)

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 and email in the chat in one message** until the end of the meeting

Assignment of Topics

- A complete list of topics will be available on the homepage next week

- https://vision.in.tum.de/teaching/ss2021/seminar_shapeanalysis
  Password: shape2021

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

- Topics will be assigned by first come first serve

Any Questions?

Do not forget to send your name/email in the chat. Students who attended this meeting will have priority.

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Webpage: https://vision.in.tum.de/teaching/ss2021/seminar_shapeanalysis

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