

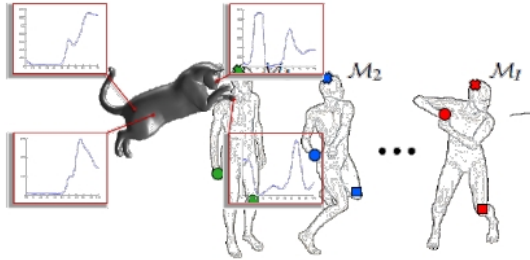


Seminar: Shape Analysis and Applications ~~in Computer Vision~~ in 3D

Preparation Meeting, 29.01.2020

Dr. Florian Bernard, Zorah Löhner, Marvin Eisenberger

What you will learn



Get an overview on research in Shape Analysis



Be able to read and understand scientific publications



Prepare and give a talk



Write a scientific report

- 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

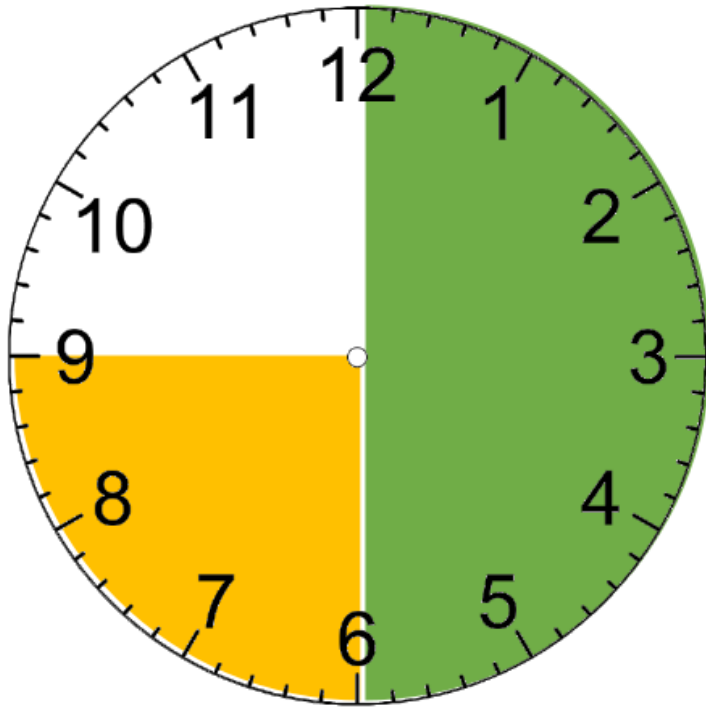


1 month

1 week

+ 2 weeks

(Hard constraints)



- ~20 slides
- 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 authors

Recommended structure

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

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

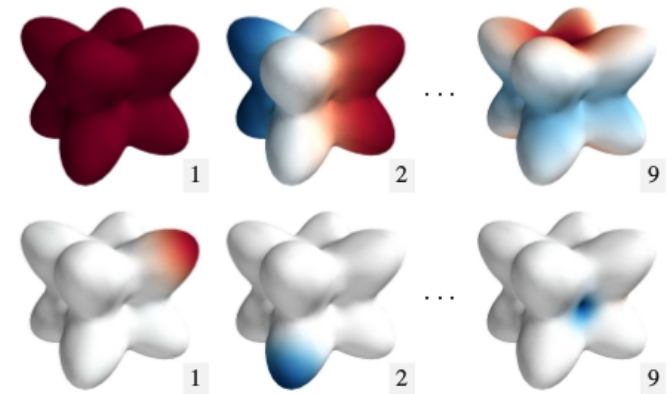
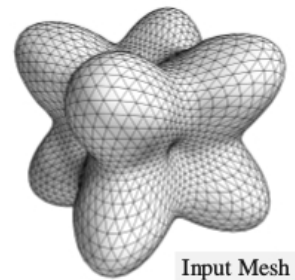
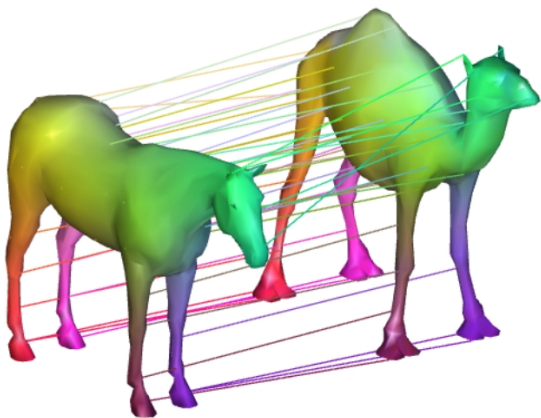


- Attendance at each meeting (Wed, 14-16) is necessary! Contact us **beforehand** if you have other appointments.
- Participation (questions, discussions) influences the final grade
- Report and presentation should be more detailed than the original paper
 1. Choose the main aspects and interesting subtopics
 2. Understand them in every detail
 3. It may be necessary to check related articles or text books
 4. Prepare the topic such that it is understandable to the other participants of the seminar

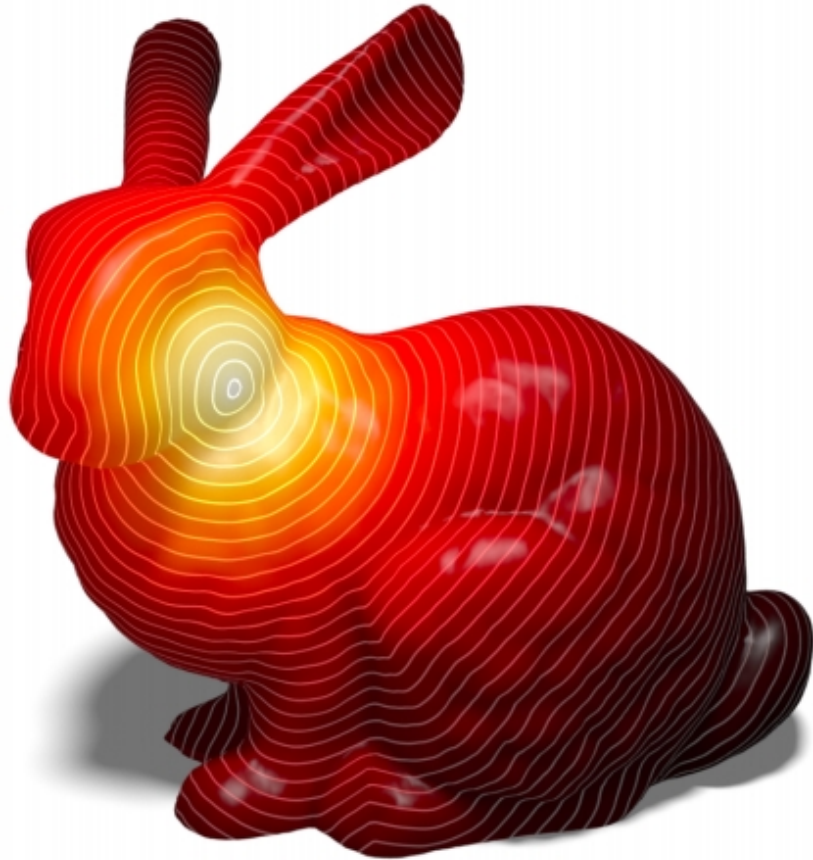
Shape Matching – finding the same points on non-rigidly deformed shapes



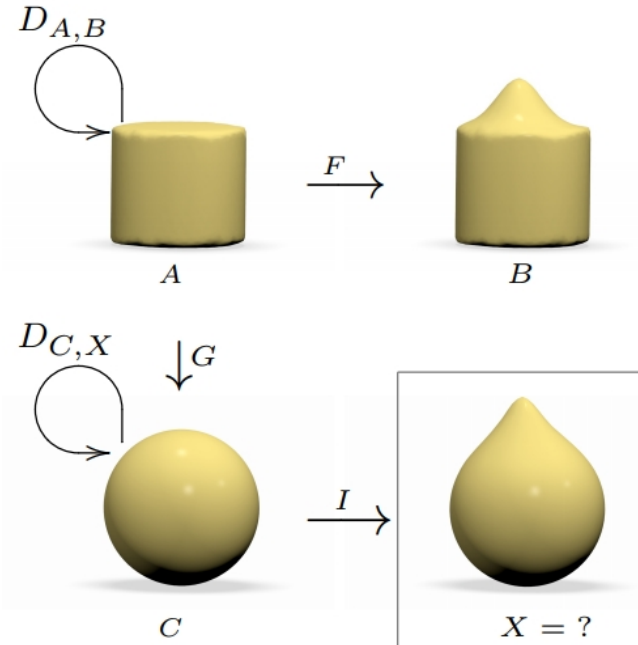
This is a high-dimensional QAP and the topics will include different relaxations and optimization methods.



Spectral decomposition on manifolds and their applications, Including optimization on manifolds

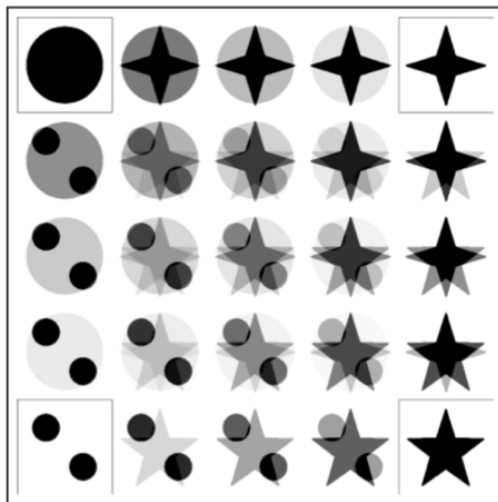
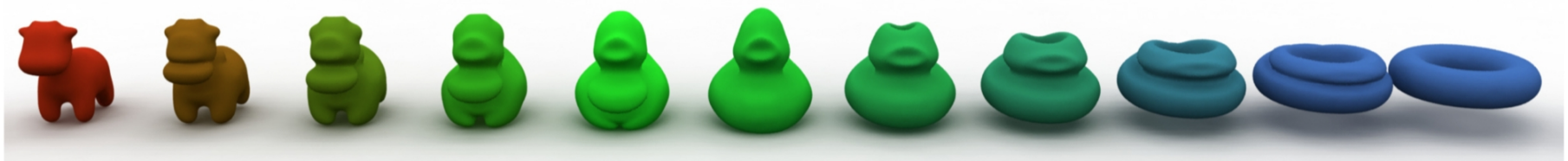


Calculation of discrete properties and descriptors, for example geodesic distances on the surface.

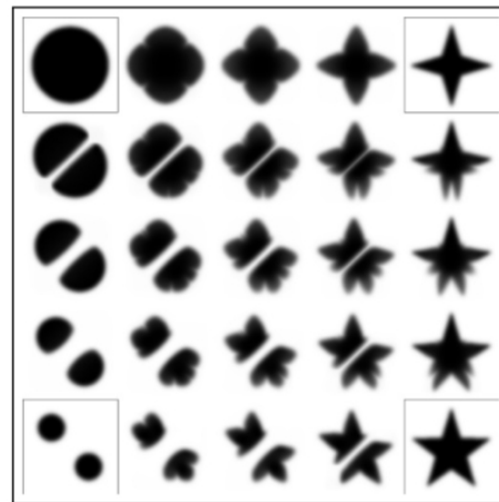


Style and property transfer through intrinsic and extrinsic operators.

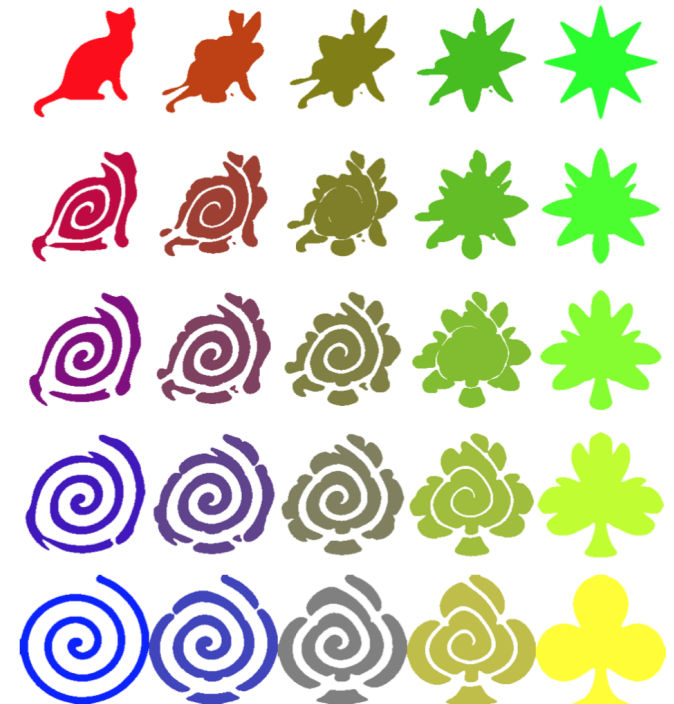
Wasserstein Barycenters – geometric interpolation between shapes



Euclidean barycenter



Wasserstein barycenter



Convolutional Wasserstein Distances: Efficient Optimal Transportation on Geometric Domains [Solomon et al., '15]

- Computer Science students apply through the TUM Matching platform (matching.in.tum.de)
- Mathematics students apply through TUMonline
- There are 15 places in total
- We gave around a list, students on it will have priority in the matching process

Assignment of Topics

- A complete list of topics will be available on the homepage next week
 - ♦ vision.in.tum.de/teaching/ss2020/seminar_shapeanalysis/
 - ♦ Password: ShapesPassword
- 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 put your name in the list. Students who attended this meeting will have priority.

Email: shapesseminar@vision.in.tum.de

Webpage: vision.in.tum.de/teaching/ws2020/seminar_shapeanalysis/

Password: ShapesPassword