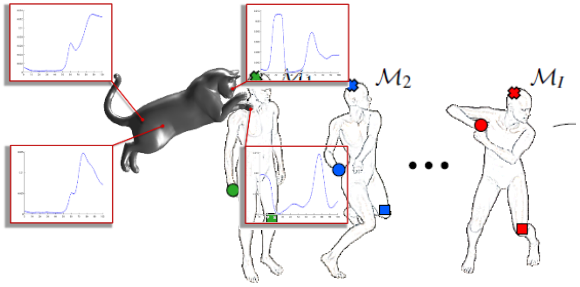
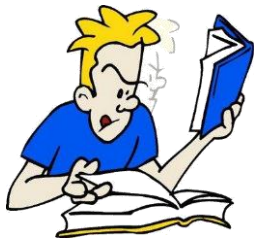
Shape Analysis and Applications in Computer Vision

Daniel Cremers **Frank R. Schmidt** **Matthias Vestner** **Zorah Lähner**

What You Will Learn in the Seminar



Get an overview on state of the art research in shape analysis



Be able to read and understand scientific publications

Prepare and give a talk

Write a scientific report

Preparation

Please do not work on your topic completely alone

Meet at least twice with your supervisor

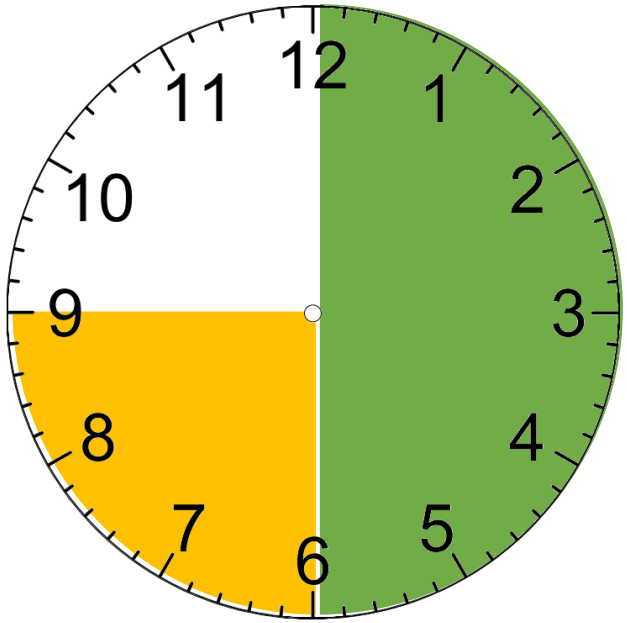
2 x

1 month

1 week

+ 2 weeks

Presentation



20 – 40 slides (ca. 1-2 minutes per slide)

Do not put too much information on the slides

Recommended structure

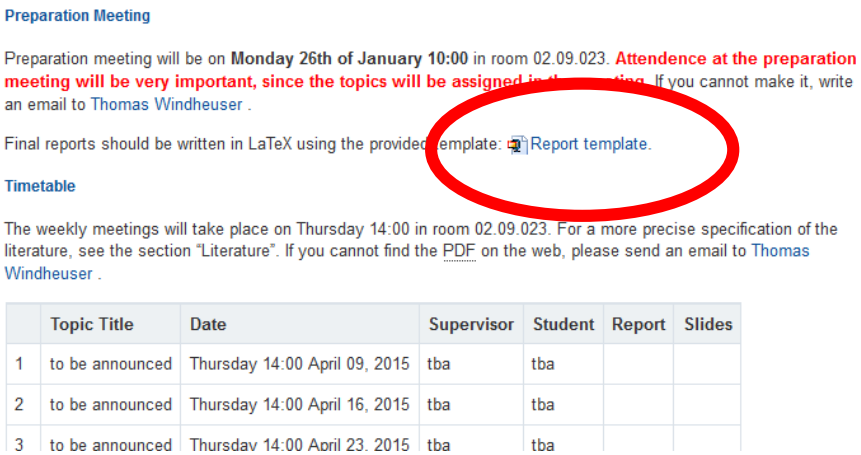
1. Introduction, problem motivation, outline
2. Approach
[3. Experimental Results]
4. Discussion
5. Summary (of scientific contributions)

Report

Overview and main contributions of the assigned topic

6-10 pages

Latex template available on the web page



Preparation Meeting

Preparation meeting will be on **Monday 26th of January 10:00** in room 02.09.023. **Attendence at the preparation meeting will be very important, since the topics will be assigned in the meeting.** If you cannot make it, write an email to Thomas Windheuser .

Final reports should be written in LaTeX using the provided template: Report template.

Timetable

The weekly meetings will take place on Thursday 14:00 in room 02.09.023. For a more precise specification of the literature, see the section "Literature". If you cannot find the PDF on the web, please send an email to Thomas Windheuser .

	Topic Title	Date	Supervisor	Student	Report	Slides
1	to be announced	Thursday 14:00 April 09, 2015	tba	tba		
2	to be announced	Thursday 14:00 April 16, 2015	tba	tba		
3	to be announced	Thursday 14:00 April 23, 2015	tba	tba		

Evaluation Criteria

Attendance at each appointment is necessary

Notice that many papers are not completely self-contained

It may be important to check related articles or text books

Report should be more detailed than original paper

Own implementations and graphics (where feasible) are appreciated

Assignment of Topics

Timetable

The weekly meetings will take place on **Thursday 14:00** in **Room 02.09.023**.
Each week two students will give a presentation.
Depending on the number of participants, dates may change.

Date	Title	Article	Topics	Student	Supervisor	Slides	Report

Password required

Enter Password: **WhatIsShape**

Daten absenden

	from Functional Correspondence	Link			Vestner		
N/A	Geodesics in Heat	PDF Link	LB	N/A	Matthias Vestner	N/A	N/A

shapeseminar@vision.in.tum.de

An: shapeseminar@vision.in.tum.de

Betreff: Favourite topics

Normaler Text | Variable Breite

Hi,

my favourite topics for the seminar on shape analysis are:

1. PaperA
2. PaperB
3. PaperC
4. PaperD

It would be nice if I get assigned one of them.

Best,
xyz

Lecture on Shape Analysis

https://vision.in.tum.de/teaching/ss2016/lecture_shape_analysis

Lecture

Monday, 10-12

Tuesday, 10-12

Exercises

Wednesday, 14-16

Analysis of Three-Dimensional Shapes (IN2238) (4h + 2h, 8 ECTS)

It is a classical problem in Machine Vision to represent, analyse and compare three-dimensional shapes. In the last years this field has known a fast development leading to a number of very powerful algorithms with a solid mathematical foundation. In this course we will present some of these, discussing both, the mathematics involved and the practical issues for the implementation.

Topics we plan to cover include:

- Foundations of Differential Geometry of surfaces (tangent spaces, shape operator, metric, geodesics and their discrete versions)
- Discrete Representations of three-dimensional shapes
- Detection of intrinsic symmetries
- Matching pairs or a collection of shapes
- The Gromov-Hausdorff distance and its variants