General Course Information

- Lectures: $13 \times 2h$
- Assignments: 5 (mandatory!)
- Exercises: $5 \times 2h$
- Computer exercises: $5 \times 2h$
- Project (optional, 3 extra credits)

Exercises and Computer Exercises are optional! They are intended to be an opportunity to work on and ask questions about the assignments.

Course requirements

- Passing the course: Approved assignments.
- Higher Grade (4 or 5): Same as above and written+oral exam.
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Literature

- Lecture notes. (Will be posted on the web one or two days before the lecture.)
- Possibly some additional scientific papers...

Additional Reading

Assignments and Exercises

- 5 assignments, contains both regular exercises and computer exercises.
- You have the opportunity to work with the assignments and ask questions during the computer exercises and regular exercises. The exercise sessions are not mandatory, but the assignments are!
- Reports should be handed in roughly one week after the computer exercise session. Exact dates are written in the assignments.

Some Instructions/Advice

- Feel free to work in groups (as many as you want).
- The reports should be individual. (You should understand and be able to explain the solution you hand in.)
- Ask as many questions as you like.
- Some of the exercises are hard. If you get stuck send a mail to magnuso@maths.lth.se. I try to answer as fast as I can.
What is Computer Vision?

**Computer Graphics**

Images  \(\xrightarrow{\text{Generate}}\) Model

- Generate images from a 3D model.

**Computer Vision**

Images  \(\xrightarrow{\text{The inverse problem:}}\) Model

- Generate 3D model from images.
Main Goal of the Course: Multiview Reconstruction

Given Images

4 images out of a sequence with 435 images.

Compute 3D Model
Point Detection and Matching

Detect interesting (descriptive) points in all images.
Reconstruction Pipeline

Point Detection and Matching

Match points between images.
Geometric Computations (main part of this course!)

Compute 3D-positions of the matched points, position and orientation of the cameras.
The Pinhole Camera

Using a pinhole camera to create an image

Reinerus Gemma-Frisus
camera obscura from 1544.
The Pinhole Camera
See lecture notes...