Computer Vision

Goal: Inferring the properties of the world from one or more images

- Photographs
- Video Sequences
- Medical images
- Microscopy data

→ **Image Understanding**

Challenges

Vision involves dealing with:

- Noisy images
- Many-to-one mapping
- Aperture problem

→ Requires:

- Assumptions about the world
- Statistical and physics-based models
- Training data

True image understanding seems to require a great deal of thinking. We are not quite there yet.

We Still See the Dog!

Opportunities

Cameras are becoming ever more prevalent and Deep networks have immensely boosted the performance of Computer Vision algorithms:

- Tremendous potential for applications.
- A window on the way the mind works.
- But limited understanding of why things work.

➡ Still much work to be done !!!!

➡ Lots of jobs in Switzerland and elsewhere.

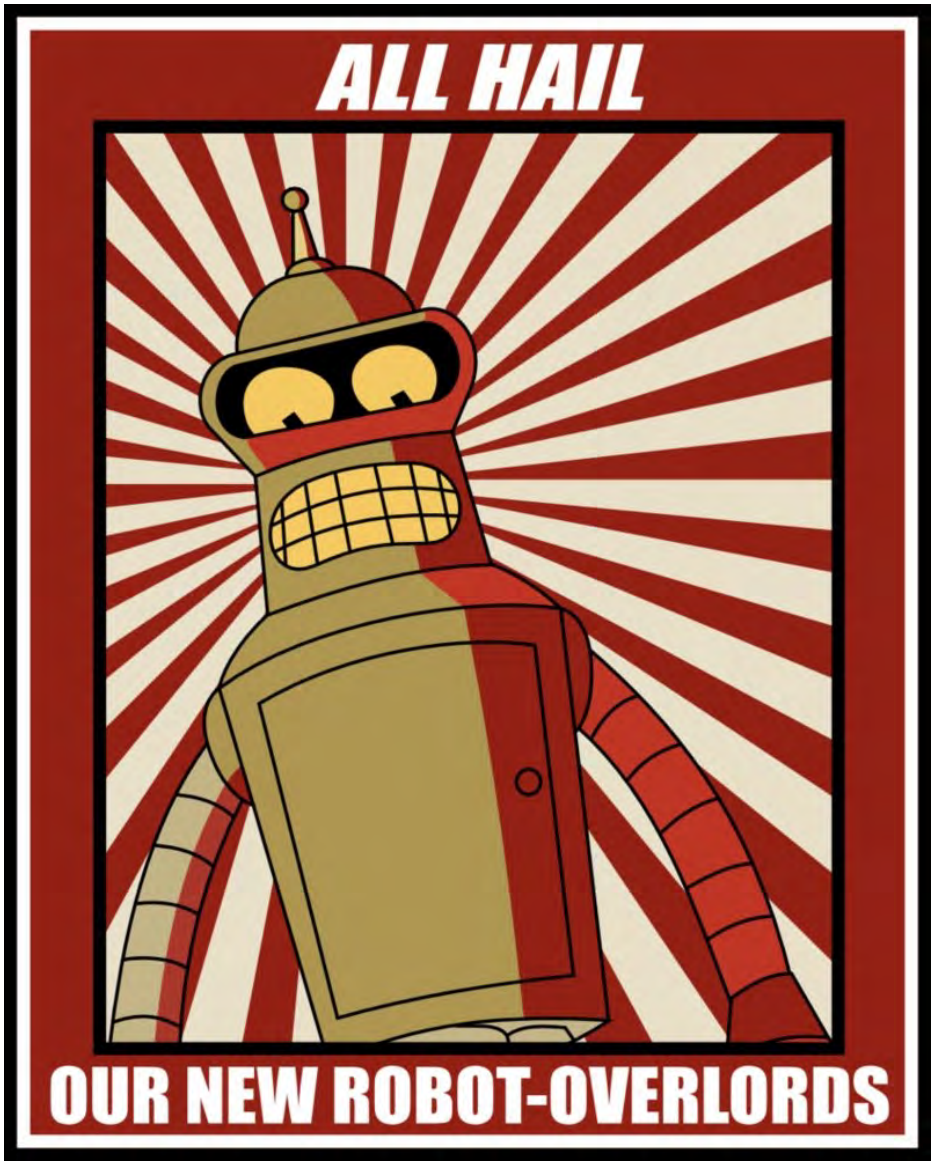
Course Outline

Introduction:
- Definition
- Human vision
- Image formation

Extracting features:
- Contours
- Texture
- Regions

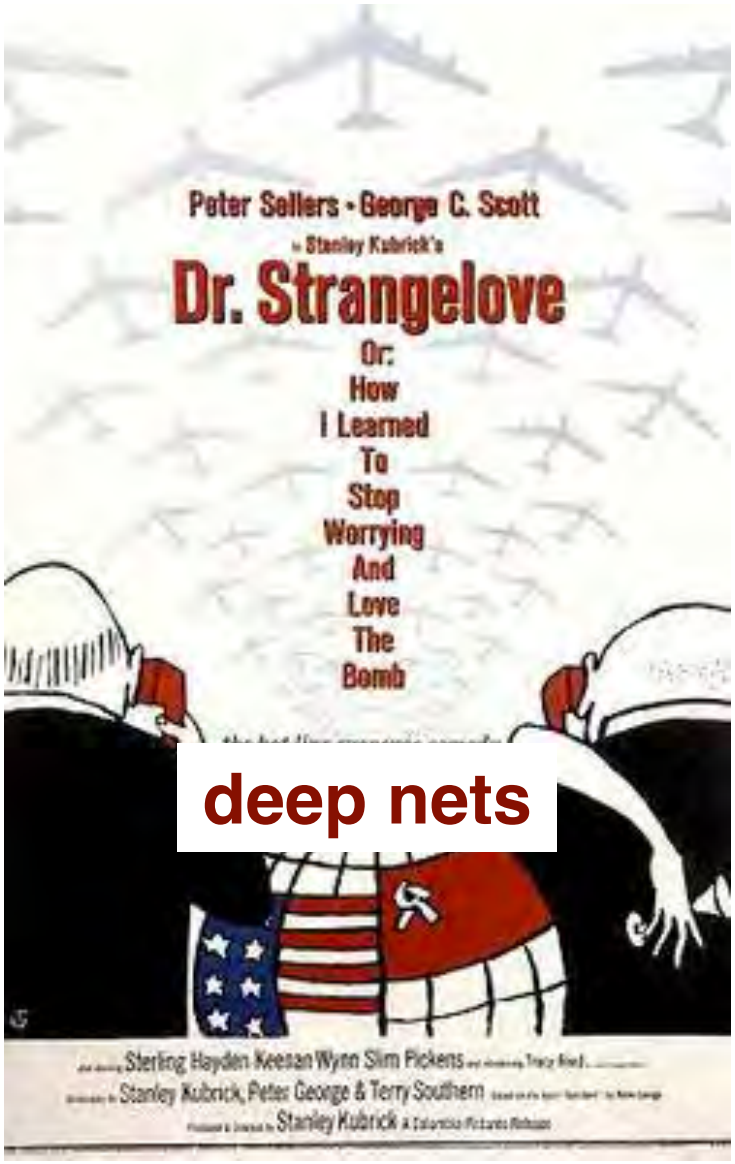
Shape recovery:
- From one image
- Using additional images

Deep Learning Revolution



or

.....



Final Exam

Tuesday 02.07.2024 from 09h15 to 10h45 (CE3, CE4, CE6)

- One sheet of **hand-written** notes is allowed.
- No other documents or electronic devices.

Slide Codes

Normal slide: It is part of the course and I may ask exam questions about it.

Reminder slide: We have already covered this earlier in the class. Go back to the appropriate lecture if you do not remember.

Optional slide: This is additional material for people interested in more details. I will not ask direct exam questions on this.

Reference to book or paper for even more details.

What you Should Revise

Segmentation

Partitioning images into separate regions of interest.

Segmentation

Computer Vision: Algorithms and Applications. Chapter 7.5.

Transformers in Natural Language Processing (NLP)