FACULTY OF ENGINEERING AND ARCHITECTURE

IMAGE PROCESSING AND INTERPRETATION (IPI)
DEPARTMENT OF TELECOMMUNICATIONS AND INFORMATION PROCESSING (TELIN)
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Computer Vision: introduction to lab sessions

GHENT UNIVERSITY

What is computer vision?

Capturing, processing, analysis and interpretation of images
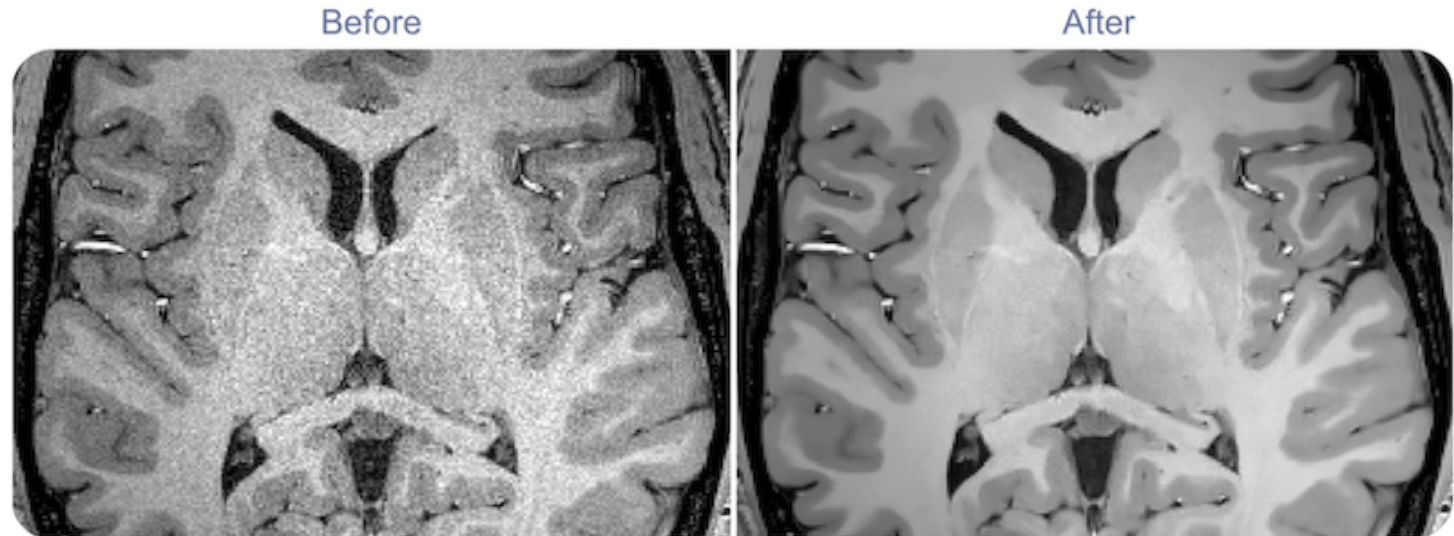
- capturing
  - inherent properties of the imaging process
    - shutter (rolling/global)
    - noise
    - lens distortion
  - compression and color formats
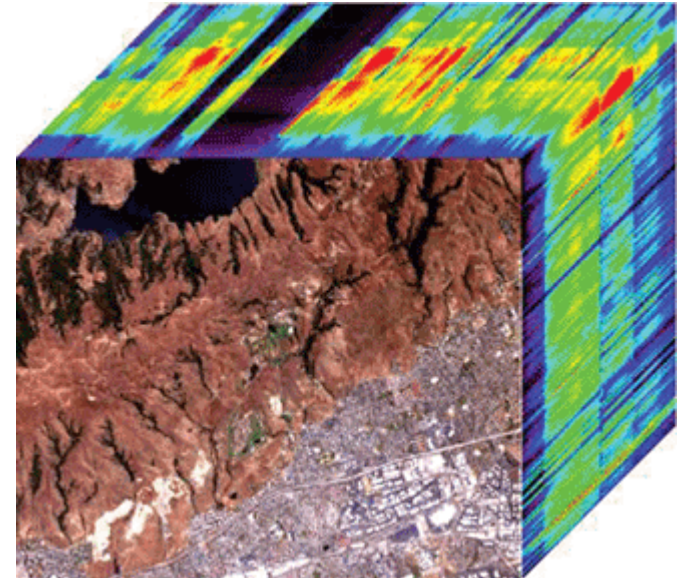
What is computer vision?

Capturing, processing, analysis and interpretation of images

- – processing
  - low level feature detection
  - contrast & color management
  - denoising
  - …

Before   After
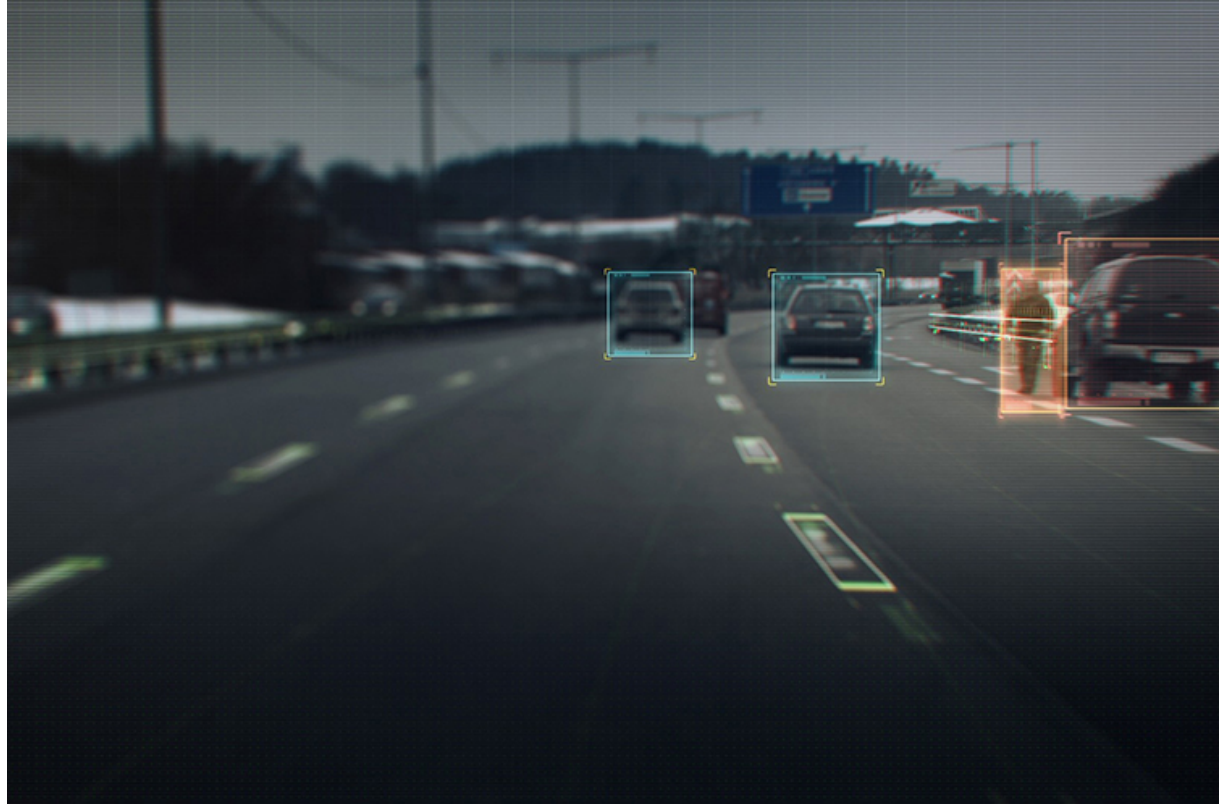
What is computer vision?

Capturing, processing, analysis and interpretation of images

- analysis
  - higher-level structure
  - global image metrics
- interpretation
  - classification
  - object recognition
  - localisation
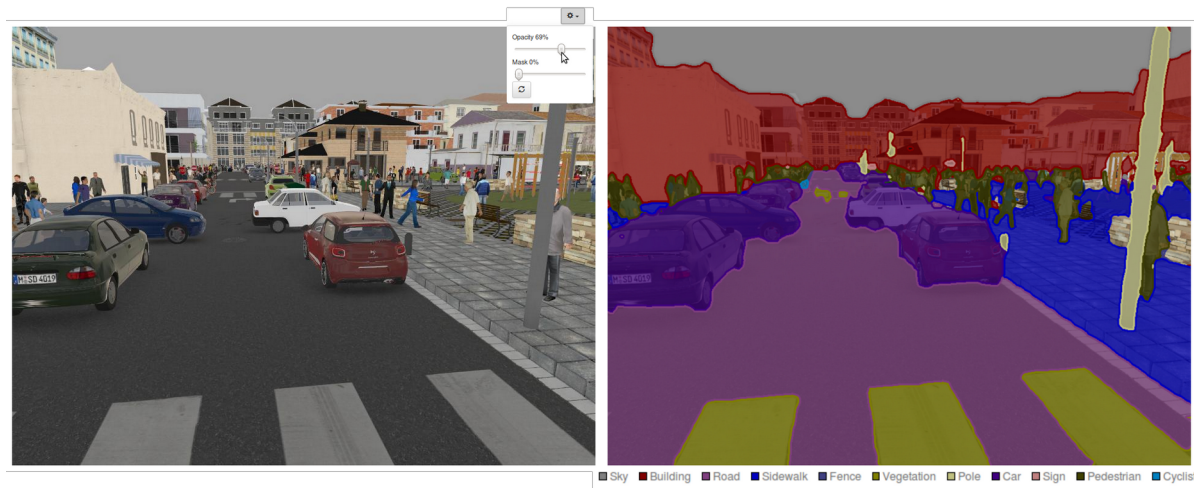
Applications of computer vision

- monitoring

- interfacing

- automation

- …

What will you be doing

- 6 lab topics (6 weeks)
  - Standard computer vision concepts, some easy, some difficult
  - Assignments are on Ufora
  - In principle, these are made individually, but collaboration and communication are encouraged
  - Platform: Python, OpenCV, PyTorch
- 1 group project (6 weeks)
  - Assignment to be communicated later

Practical

What is expected of you for the lab sessions?

– **Each student** enters a report for every lab session via the Ufora exercise assignment

- Follow the structure of the assignment
- Write an answer to any questions in the assignment
- Show an image of the solution of every assignment
- Include the full source code of your solution at the end of the report (within the same file)
- Also upload the python script separately so I can debug it if necessary
- Tips for making my life easier (improves my mood while grading):
  - Use relative paths for source images (not "c:/Documents and Settings/Jantje/…")
  - Do not zip an entire visual studio project to send me 30 lines of code
  - Provide a few comments to clarify which block of code solves which assignment

Plagiarism on the lab reports

- You can work together and share code (how could we stop you?)
- If your solutions and reports are identical, please mark the names of the contributors
  - No more than five names per report please
- However, to make sure that everyone is at least in possession of a working solution
  - Print your name(s) onto the result images using opencv code
    - Make a function for this in lab 1 and use it for every result
  - **Every collaborator** uploads a copy of this joint report from his own Ufora account
    - That way I am sure you can at least read it if you want to

Example of a report

- This example can be found on Ufora

John Doe & Jane Smith

Question 1

Why did the chicken cross the road?
To get to the other side.

Exercise 1

John Doe | Jane Smith

Code

```
1  import cv2
2
3  def print_name(im, name):
4    im = cv2.putText(im, name, (10, im.shape[0]-15), cv2.FONT_HERSHEY_SIMPLEX, 0.5,
      (255,255,255), 1, cv2.LINE_AA)
5    return im
6
```

Attendance

- Attendance to the lab sessions is not mandatory

- The assignments are intended to be self-explanatory and there will not be lectures preceding the lab unless explicitly announced on Ufora

- Anyone can ask questions via teams during the lab hours, but people physically in the lab get priority

Deadlines (tentative)

Item	Due date
Lab 1 report	Feb 17
Lab 2 report	Feb 24
Lab 3 report	Mar 3
Lab 4 report	Mar 10
Lab 5 report	Mar 17
Lab 6 report	Mar 24
Project	Theory exam date; tbd