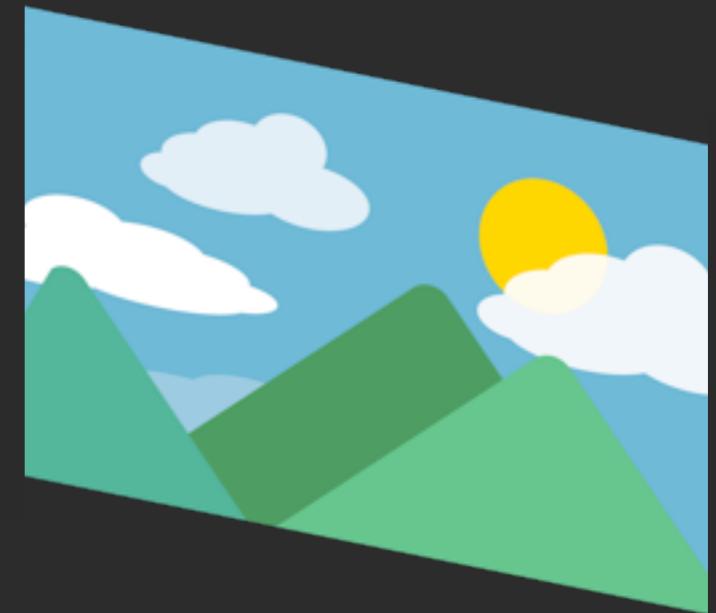
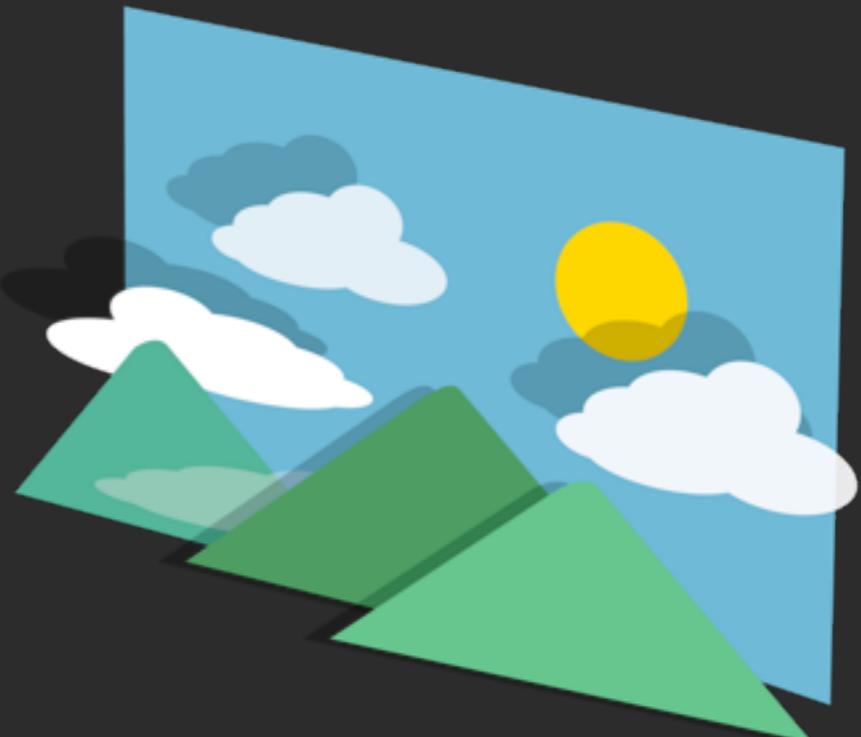
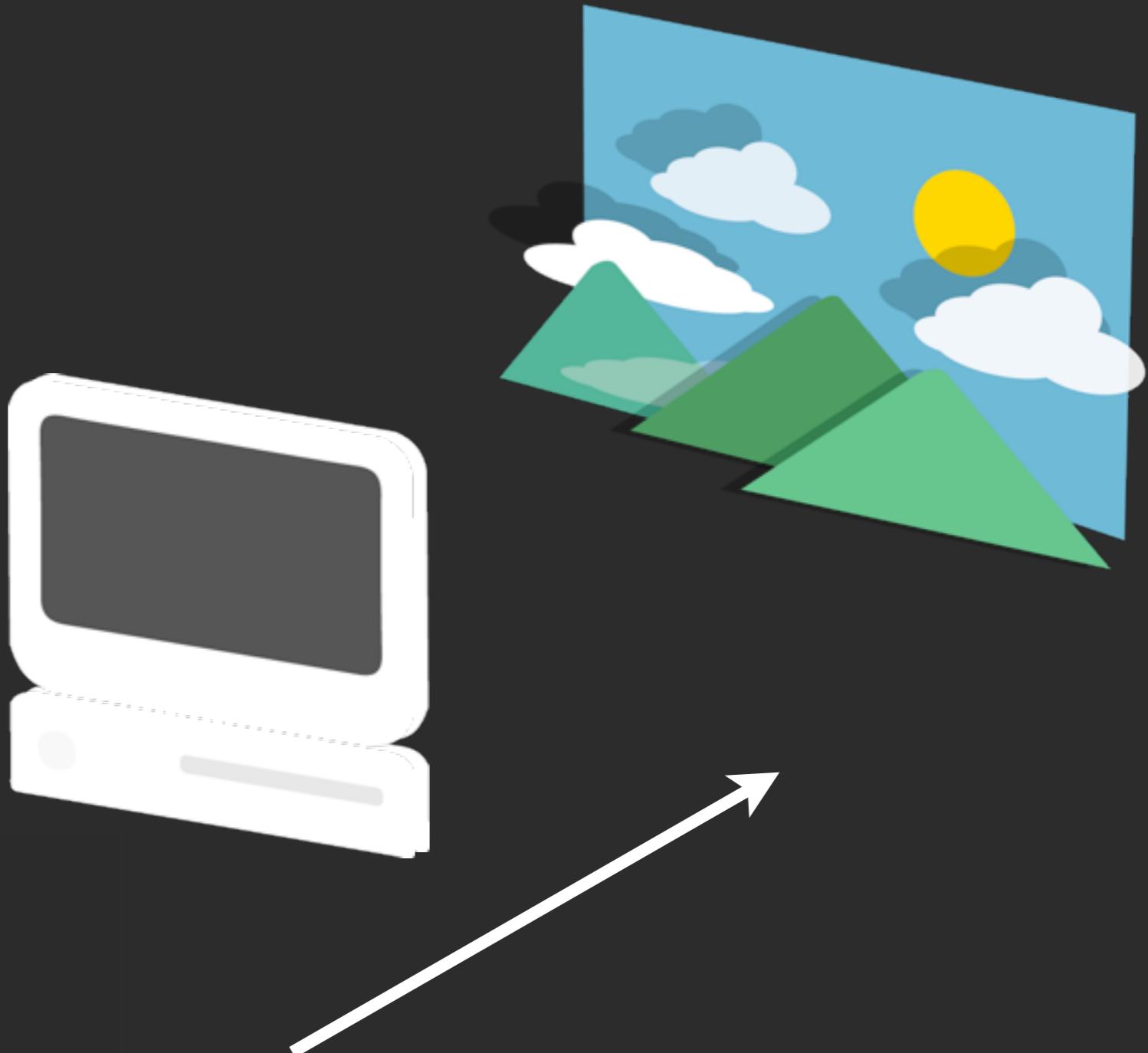
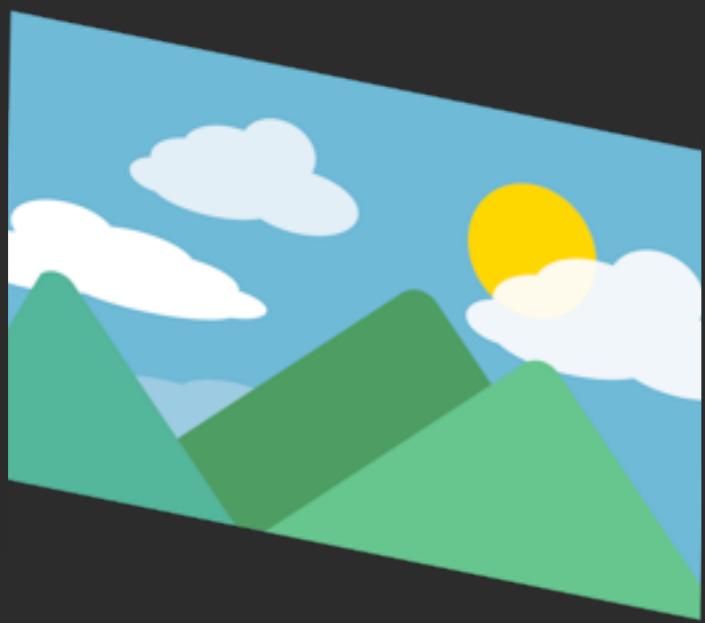


Computer Vision

# Computer Vision

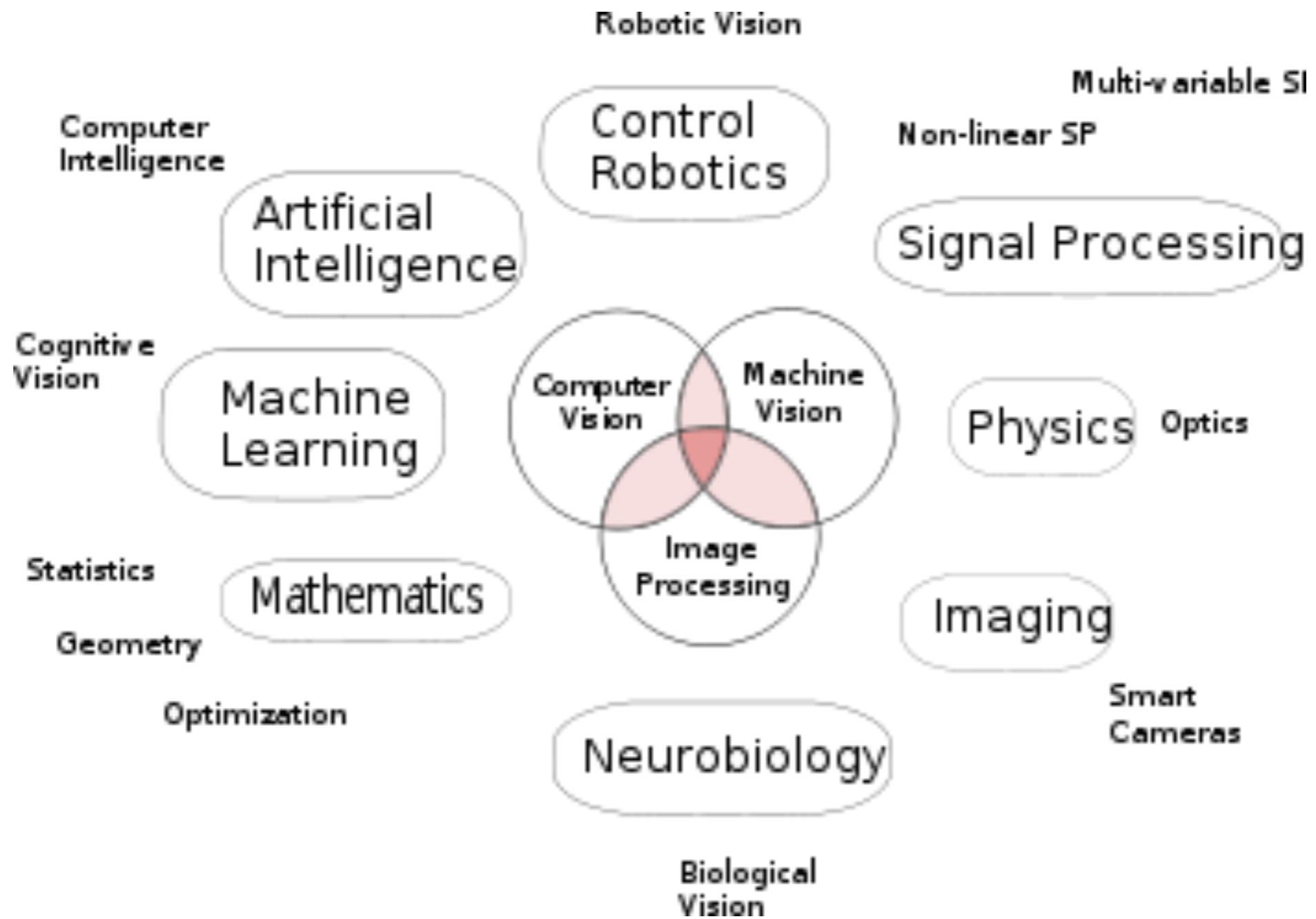
to duplicate the abilities  
of human vision





How do robot see  
the world?

<https://vimeo.com/36239715>



# Typical tasks of computer vision

Recognition

Image  
restoration

Scene  
reconstruction

Motion  
analysis

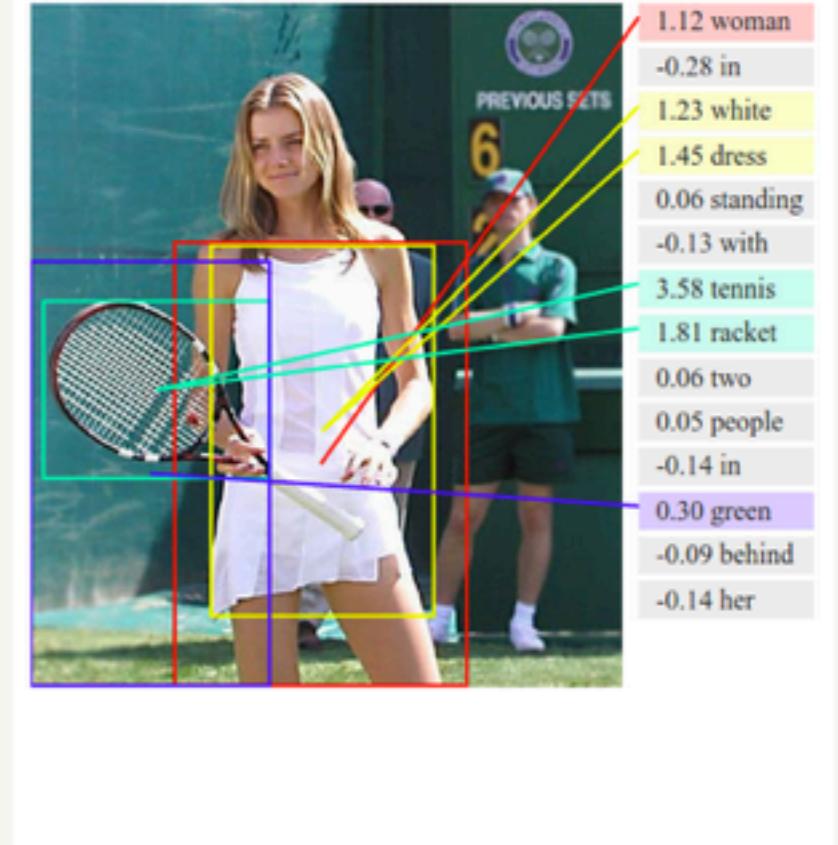
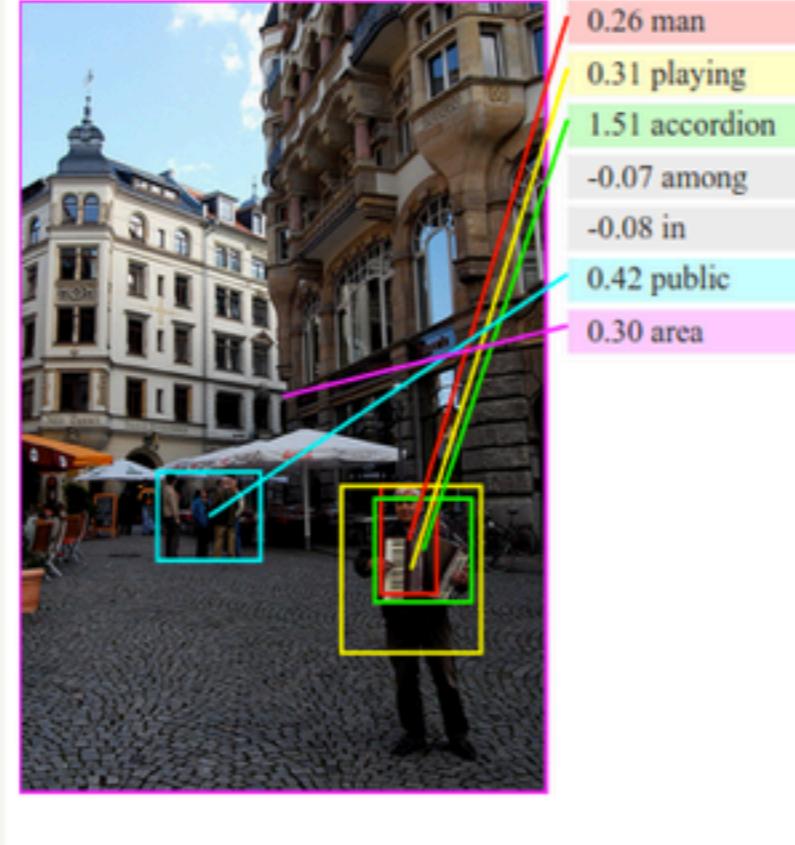
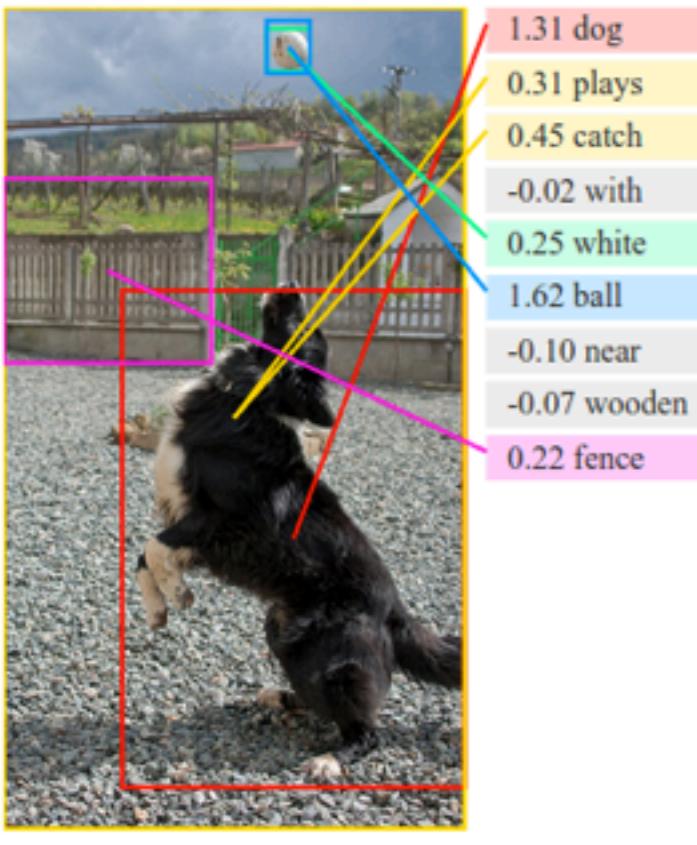
# Applications

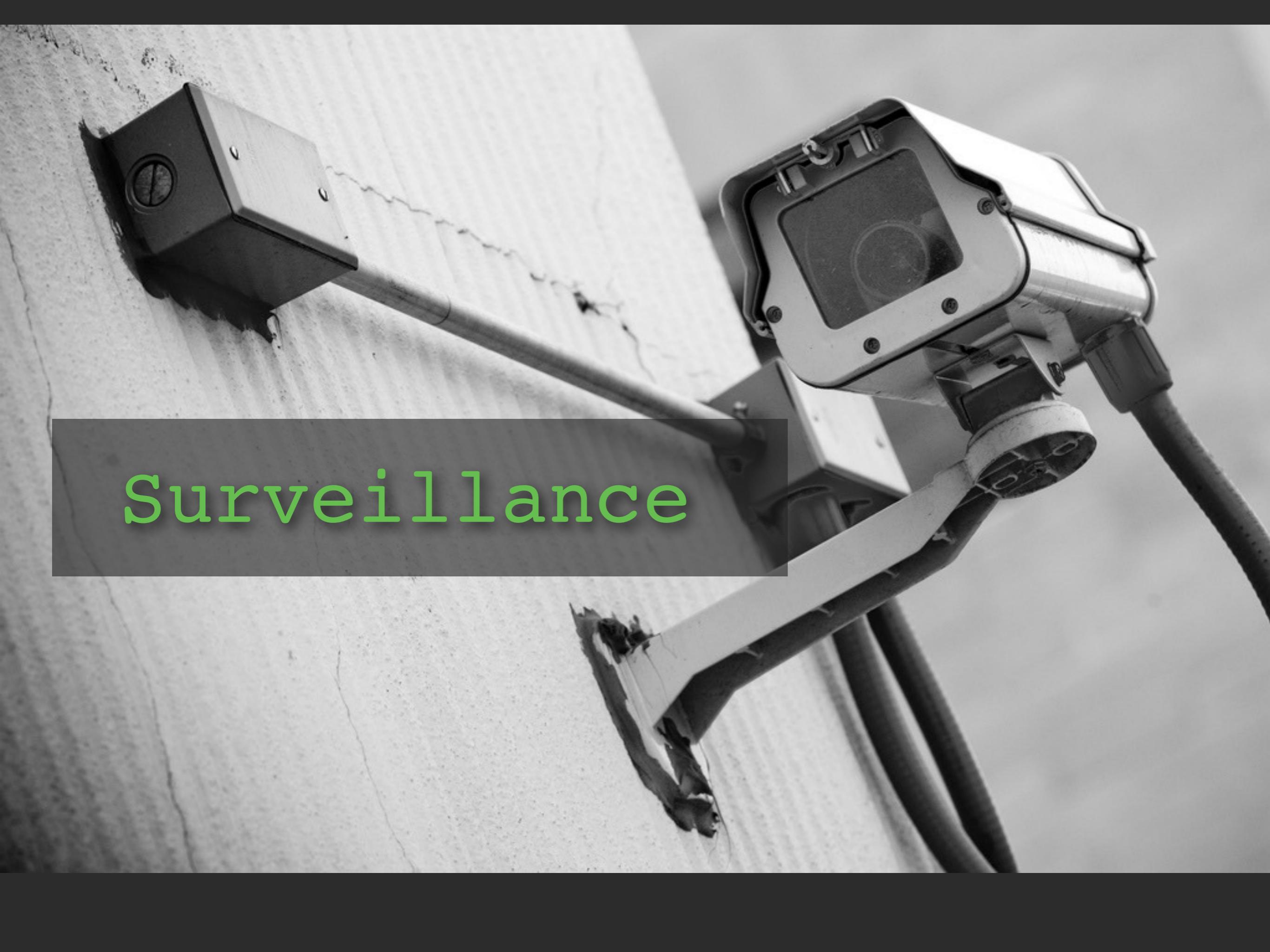


# Object Recognition

## Visual-Semantic Alignments

Our alignment model learns to associate images and snippets of text. Below are a few examples of inferred alignments. For each image, the model retrieves the most compatible sentence and grounds its pieces in the image. We show the grounding as a line to the center of the corresponding bounding box. Each box has a single but arbitrary color.





Surveillance

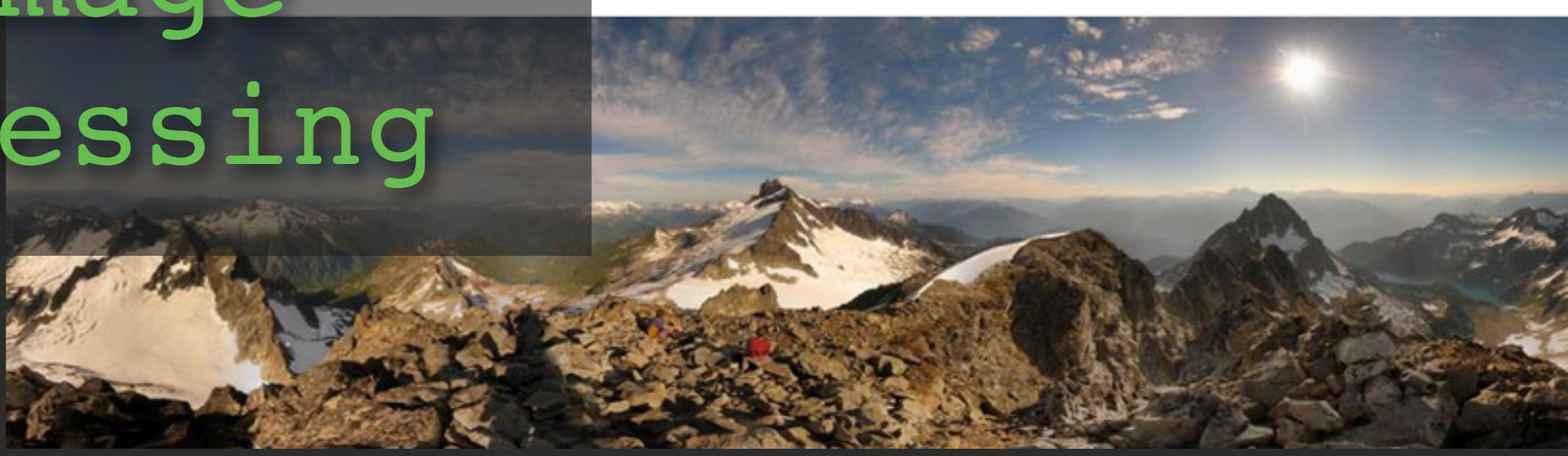
# 2D Image Processing



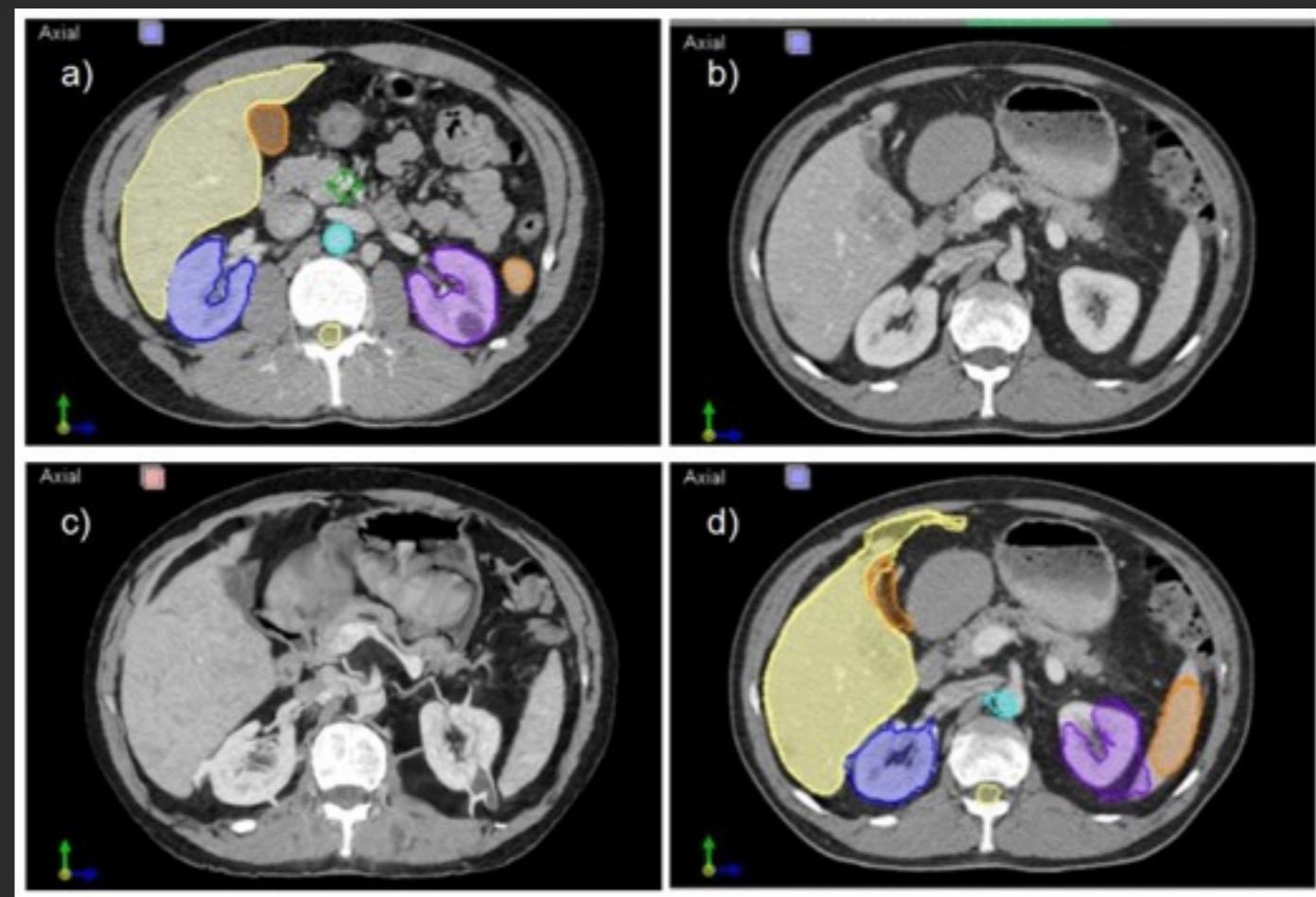
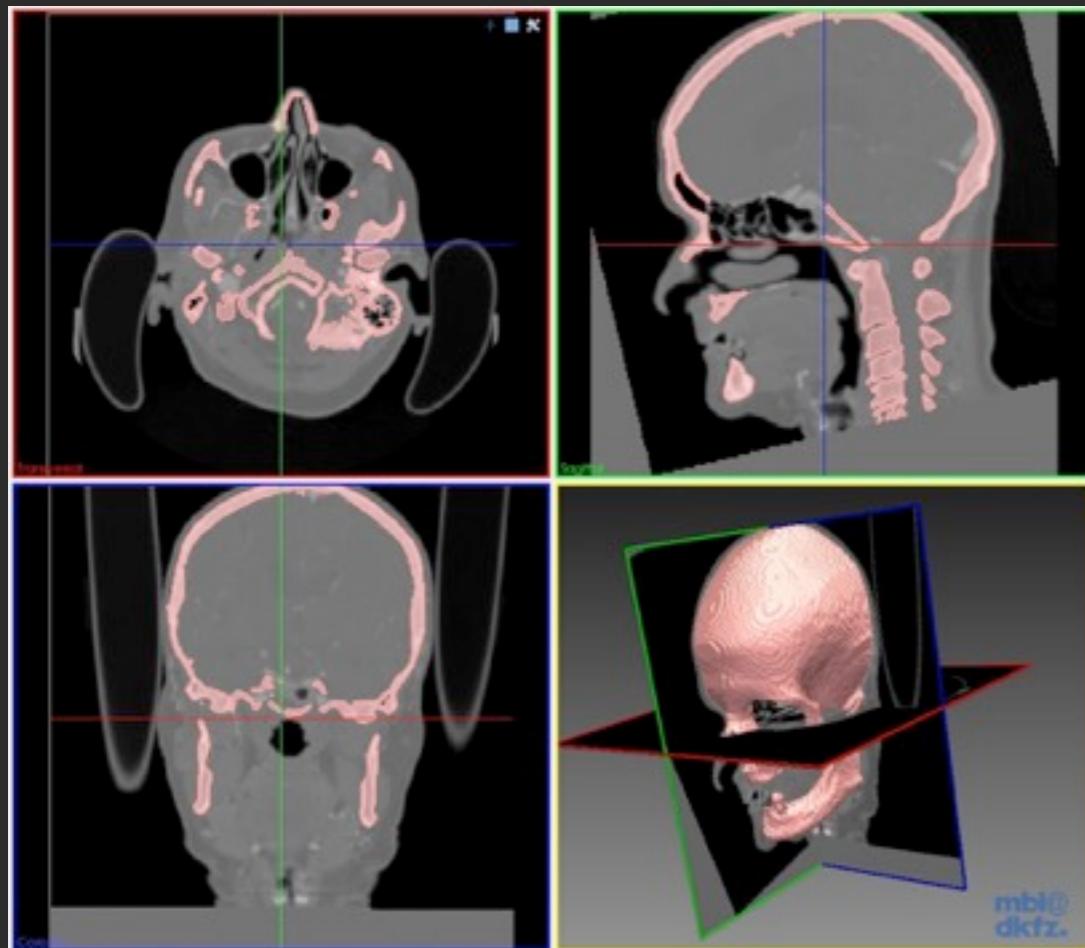
25 of 57 images aligned

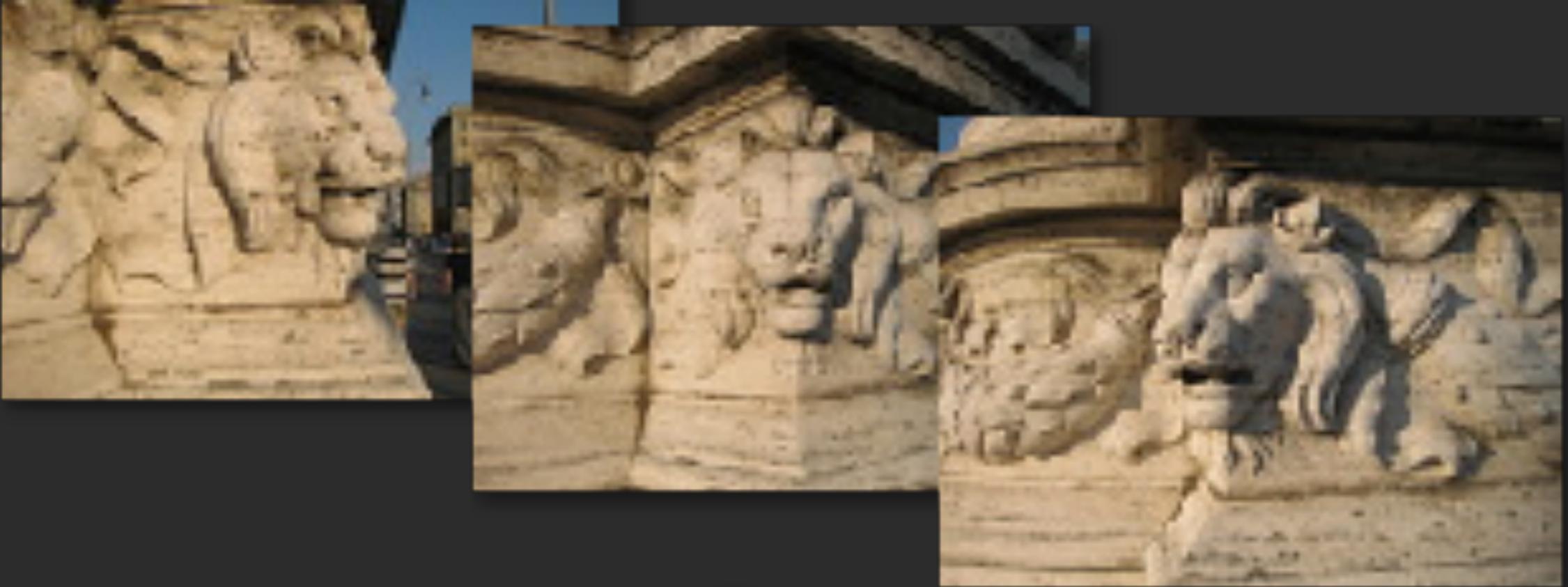


All 57 images aligned



# Medical Image Processing



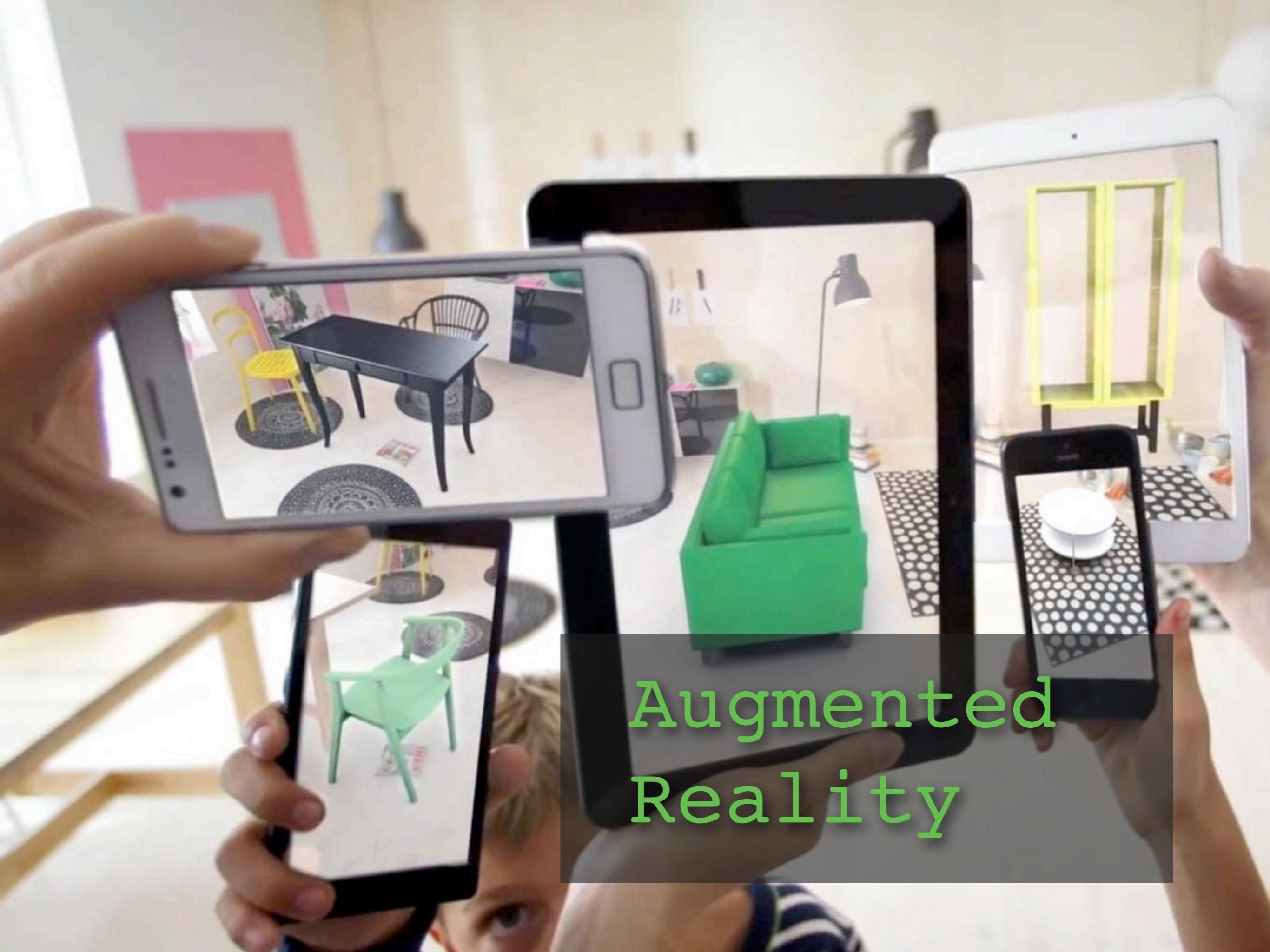


# 3D Modelling



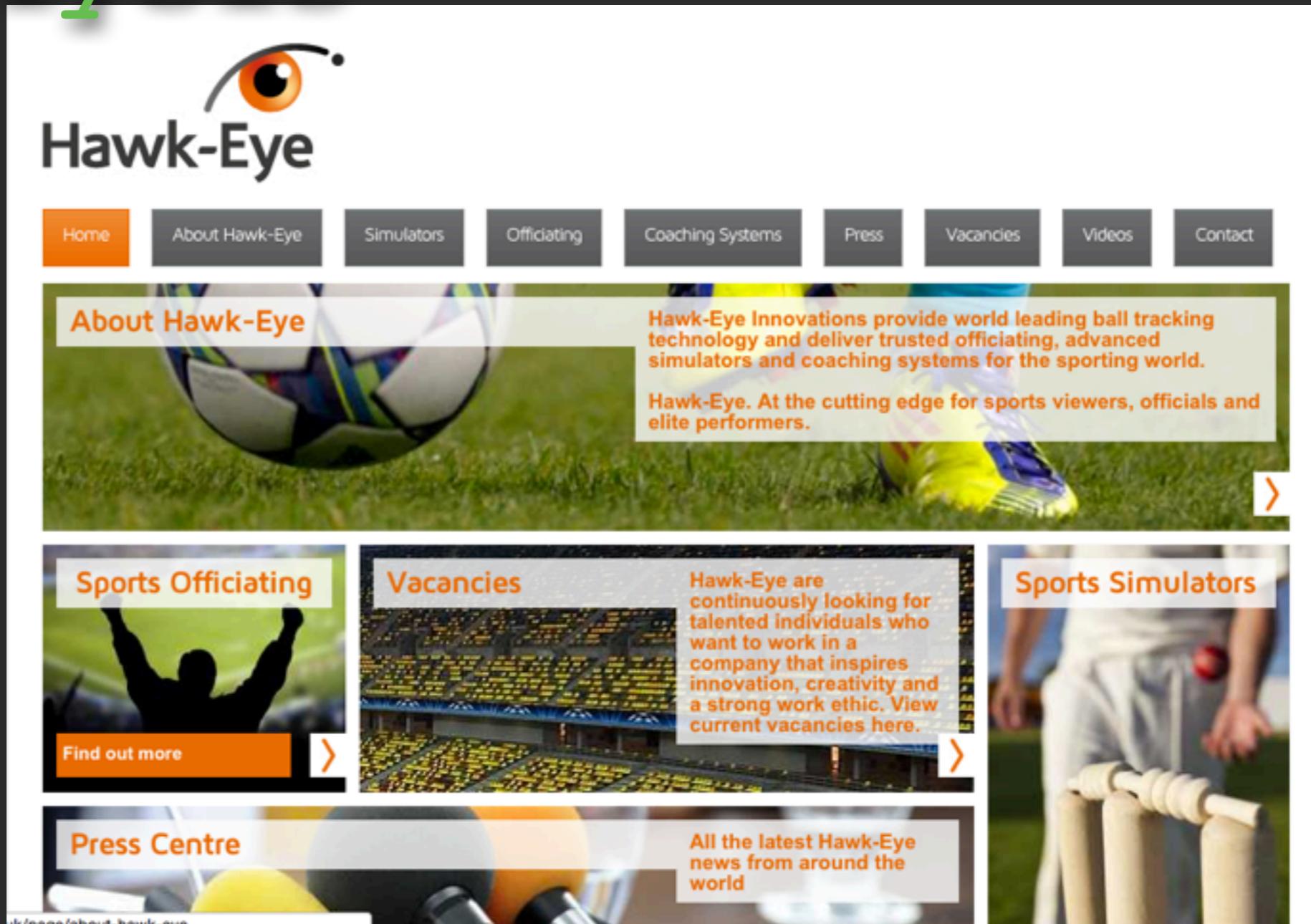
# structure from motion

[https://www.youtube.com/watch?  
v=jtyXkuNPplg](https://www.youtube.com/watch?v=jtyXkuNPplg)



Augmented  
Reality

# Sport Analysis



The image shows a screenshot of the Hawk-Eye Innovations website. At the top is a navigation bar with a logo of a stylized eye and the text "Hawk-Eye". Below the logo is a horizontal menu with the following items: Home (highlighted in orange), About Hawk-Eye, Simulators, Officiating, Coaching Systems, Press, Vacancies, Videos, and Contact. The main content area features a large image of a soccer ball on grass. Overlaid on this image is a white box containing the text "About Hawk-Eye" and a description of the company's services. To the right of the main image are two smaller boxes: one for "Sports Officiating" showing a silhouette of a referee, and another for "Vacancies" showing a stadium. Below these are two more boxes: "Press Centre" showing microphones, and "Sports Simulators" showing a cricket player. A navigation arrow is visible on the right side of the main image.

**Hawk-Eye**

Home    About Hawk-Eye    Simulators    Officiating    Coaching Systems    Press    Vacancies    Videos    Contact

**About Hawk-Eye**

Hawk-Eye Innovations provide world leading ball tracking technology and deliver trusted officiating, advanced simulators and coaching systems for the sporting world.

Hawk-Eye. At the cutting edge for sports viewers, officials and elite performers.

**Sports Officiating**

Find out more >

**Vacancies**

Hawk-Eye are continuously looking for talented individuals who want to work in a company that inspires innovation, creativity and a strong work ethic. View current vacancies here.

**Sports Simulators**

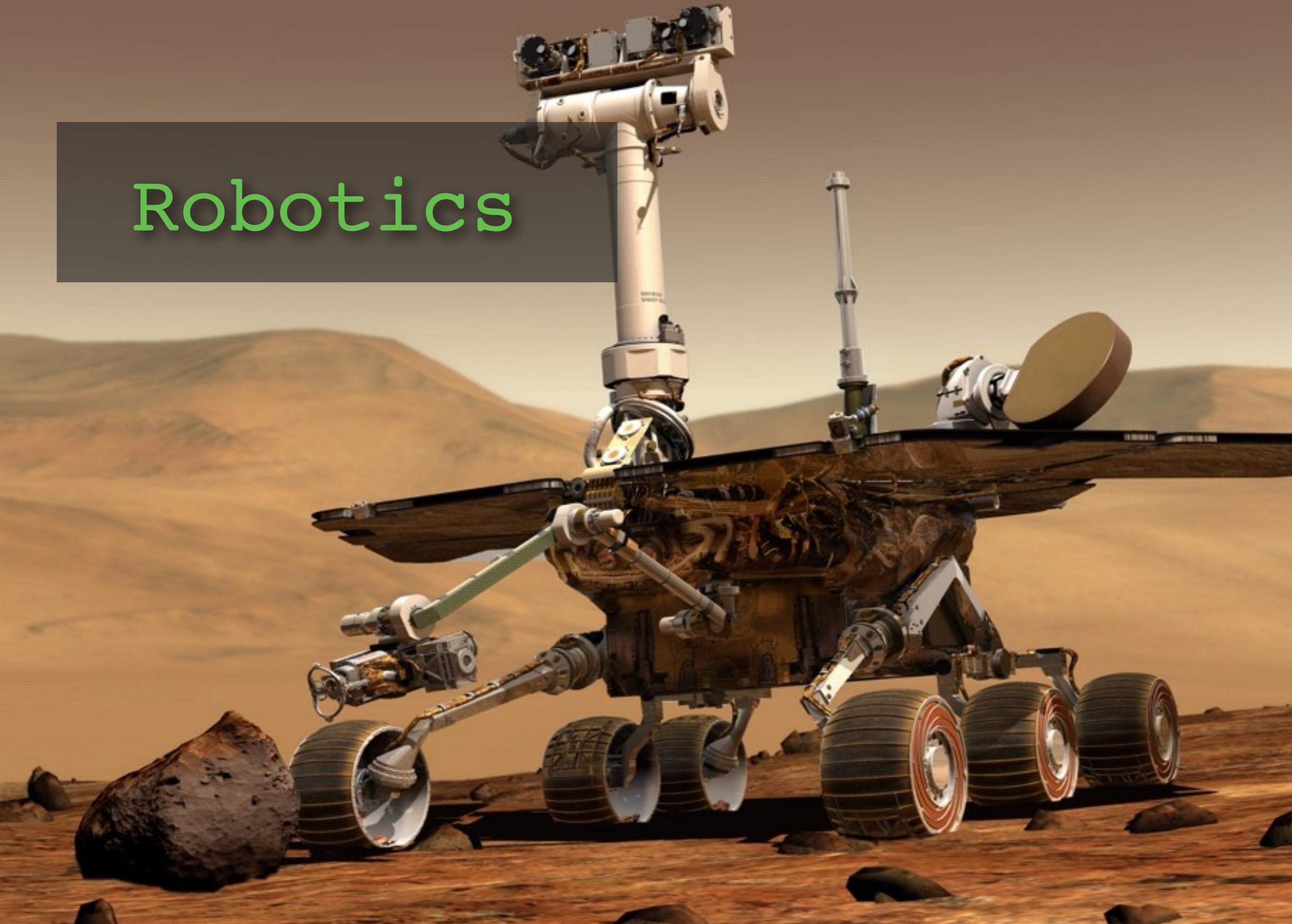
**Press Centre**

All the latest Hawk-Eye news from around the world

# multi view geometry

<https://vimeo.com/52537280>

# Robotics



# Simultaneous localization and mapping

[https://www.youtube.com/watch?  
v= qILAWp7AqQ](https://www.youtube.com/watch?v=qILAWp7AqQ)

# Google Driverless Car



# Google Driverless Car

[https://www.youtube.com/watch?  
v= qILAWp7AqQ](https://www.youtube.com/watch?v=qILAWp7AqQ)

How can we use  
computer vision  
technology?

# OpenCV

a open source library for  
computer vision using C/C++  
Python and Java

# Tracking.js

Use computer vision in  
the browser.  
It's Javascript!!!

THE END