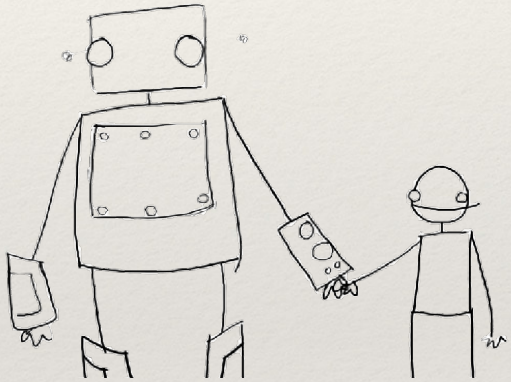
VVV18 Winter School

ROBOT VISION



ROBOT VISION

Image Processing <=====> Computer Vision

acquisition

compression

enhancement

restoration

segmentation

representation

pattern recognition

understanding

ROBOT VISION

Make computers / robots understand images and video

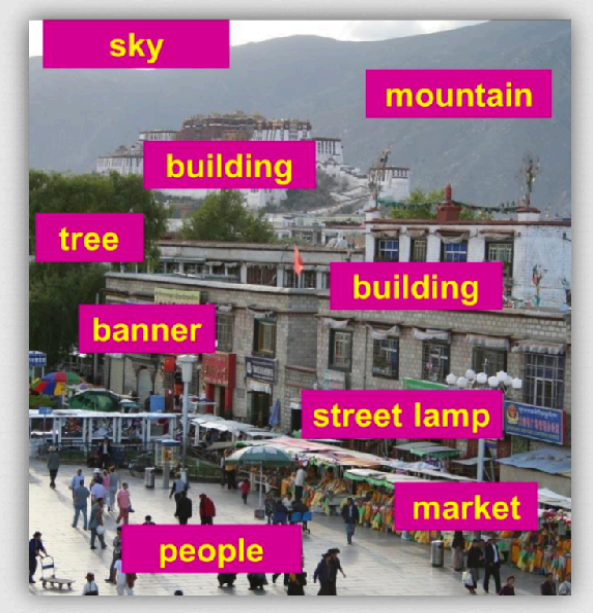
- Specific Recognition Tasks
  - Outdoor, indoor.
  - City, forest, factory.
- Image Annotation
  - street
  - people
  - building
  - mountain
  - tourism
  - cloudy
  - brick

ROBOT VISION

Make computers / robots understand images and video

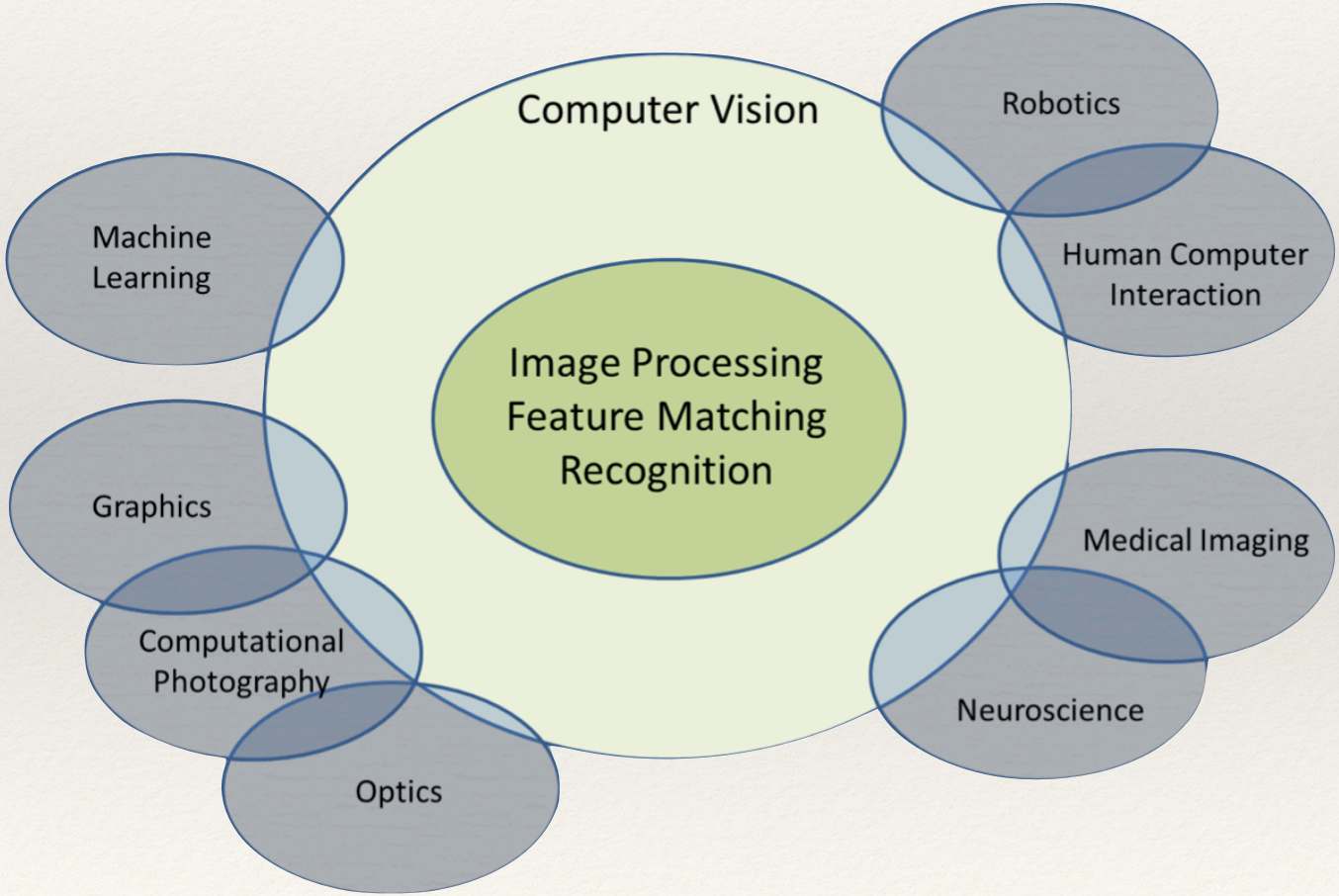
- Object Detection
  - Find Pedestrian

- Image Segmentation



ROBOT VISION

Computer Vision Scope



ROBOT VISION

Computer Vision is **Challenging…**

ROBOT VISION

Computer Vision is **Challenging…very**

ROBOT VISION

Computer Vision is **Challenging…**

- Where was this picture taken ?
- How many people are there ?
- What are they doing ?
- What is the object the person on the left is standing on?
- Why is this a funny picture ?

ROBOT VISION

Computer Vision is **Challenging…**

- Where was this picture taken ?
- How many people are there ?
- What are they doing ?
- What is the object the person on the left is standing on?
- Why is this a funny picture ?

ROBOT VISION

Computer Vision is **Challenging…**

- Where was this picture taken ?
- How many people are there ?
- What are they doing ?
- What is the object the person on the left is standing on?
- Why is this a funny picture ?

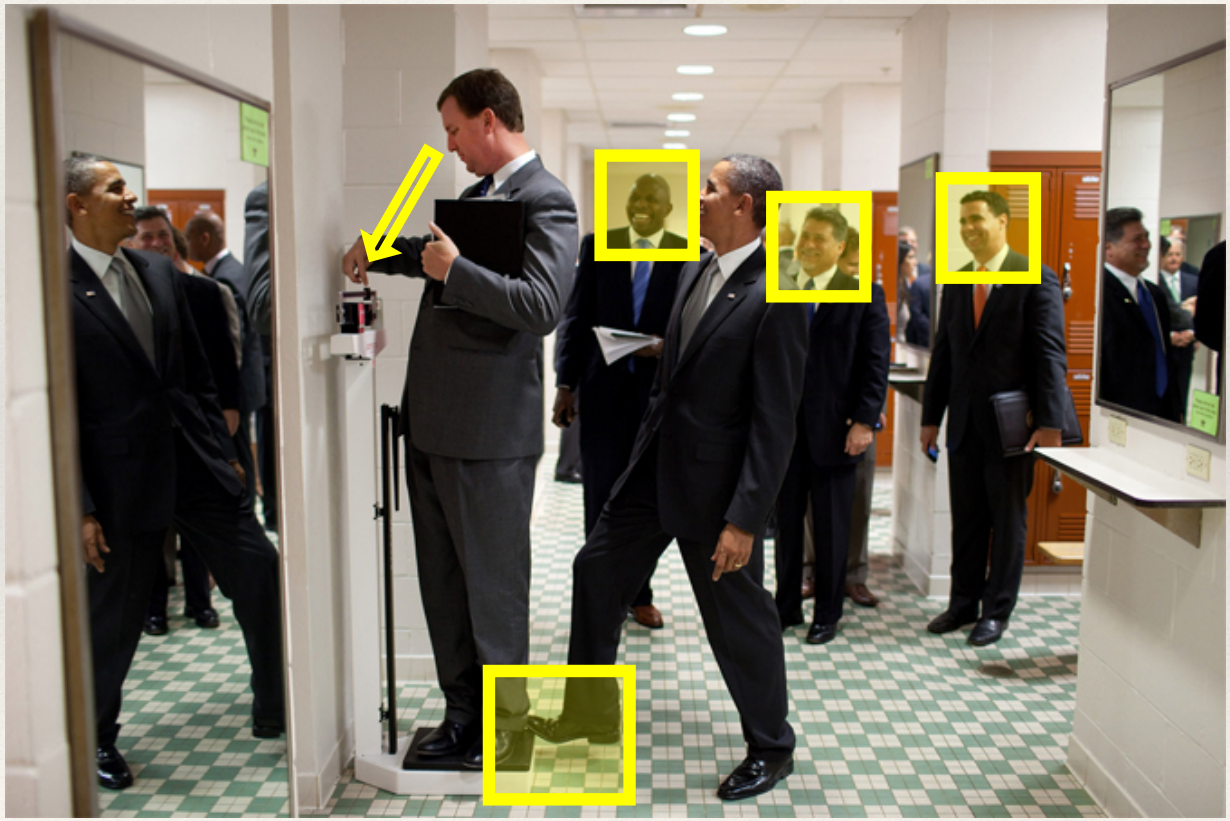
ROBOT VISION

Computer Vision is **Challenging…**

- Where was this picture taken ?
- How many people are there ?
- What is the object the person on the left is standing on?
- What are they doing ?
- Why is this a funny picture ?

ROBOT VISION

Computer Vision is **Challenging…**



- Where was this picture taken ?
- How many people are there ?
- What are they doing ?
- What is the object the person on the left is standing on?
- Why is this a funny picture ?

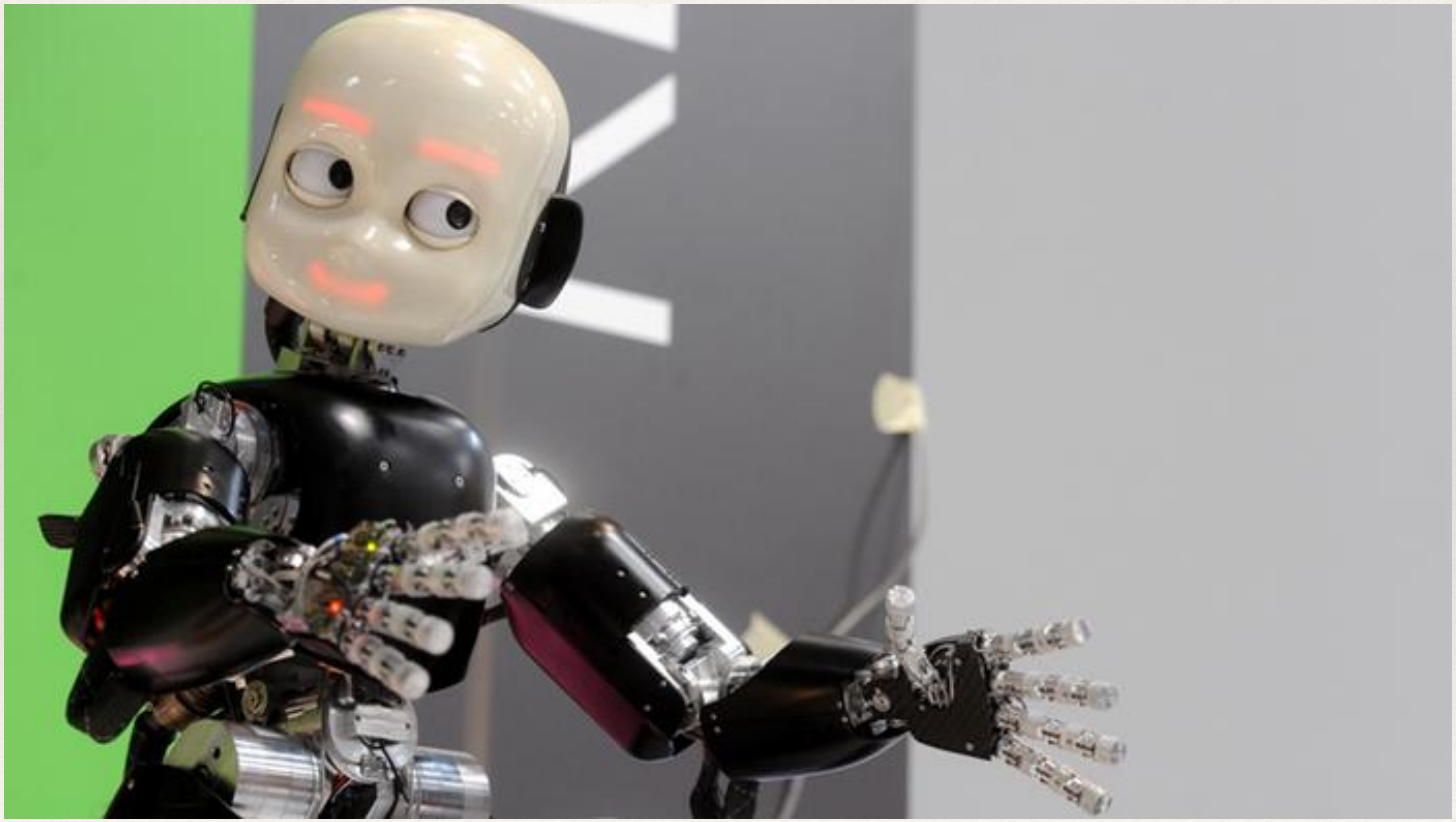
ROBOT VISION

Computer Vision is **Challenging…**

- Where was this picture taken ?
- How many people are there ?
- What are they doing ?
- What is the object the person on the left is standing on?
- Why is this a funny picture ?

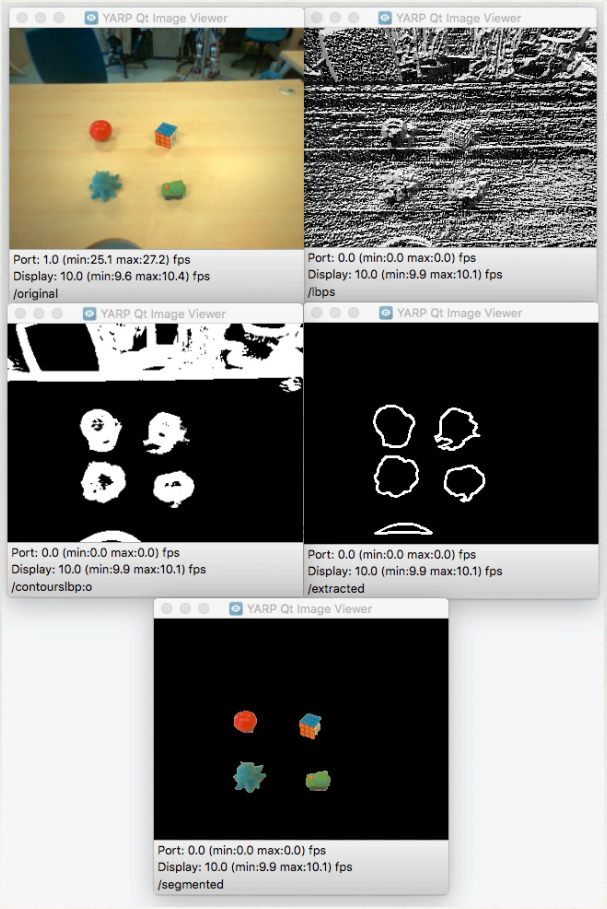
ROBOT VISION

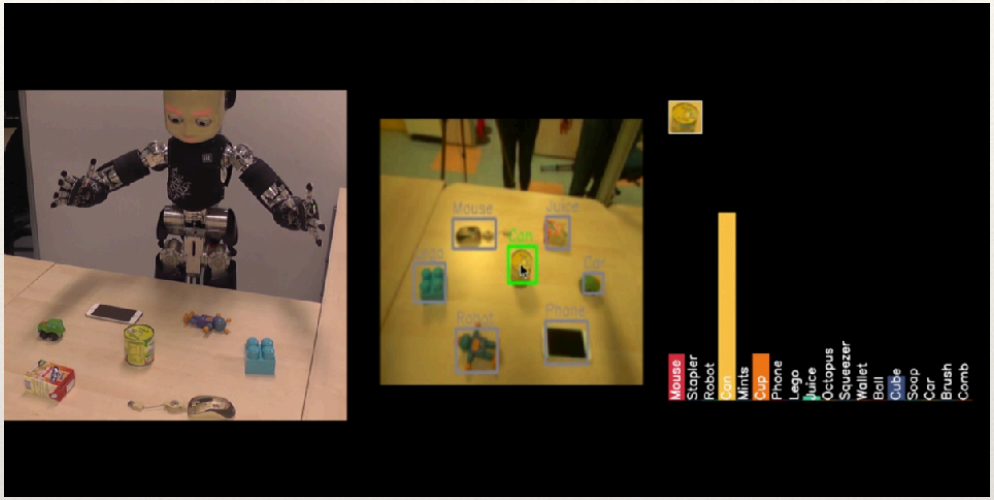
Fundamentals and Applications - 2D Vision

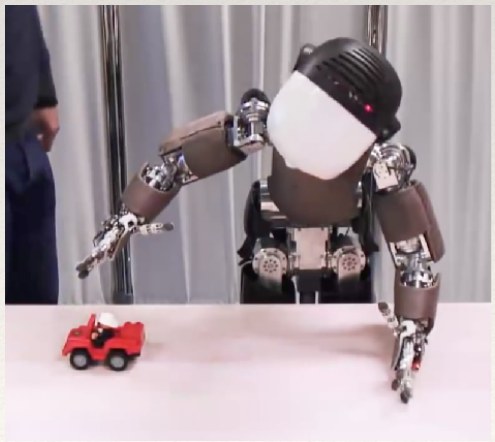


ROBOT VISION

Fundamentals and Applications - 2D Vision

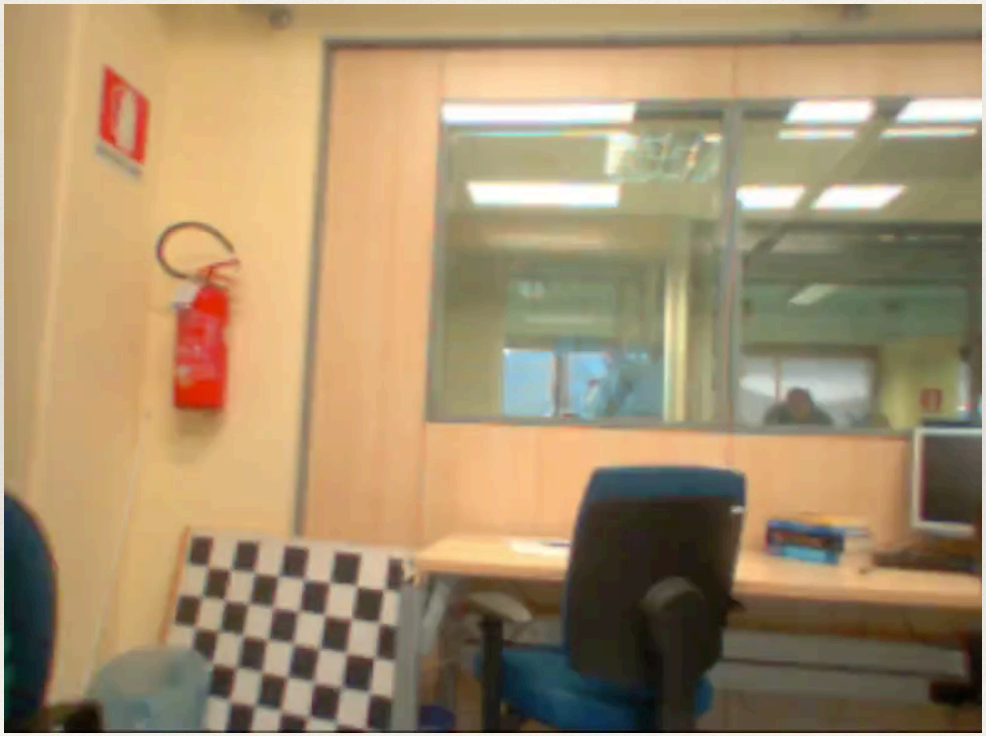






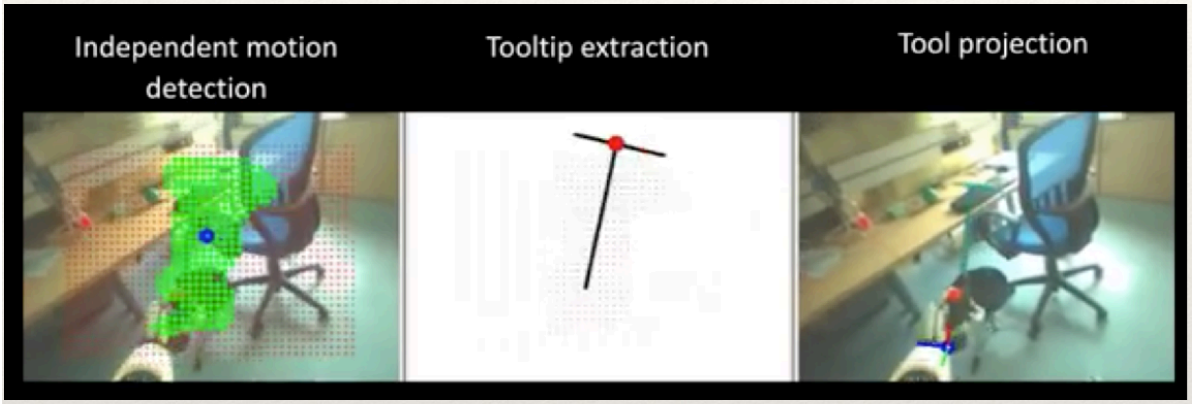
ROBOT VISION

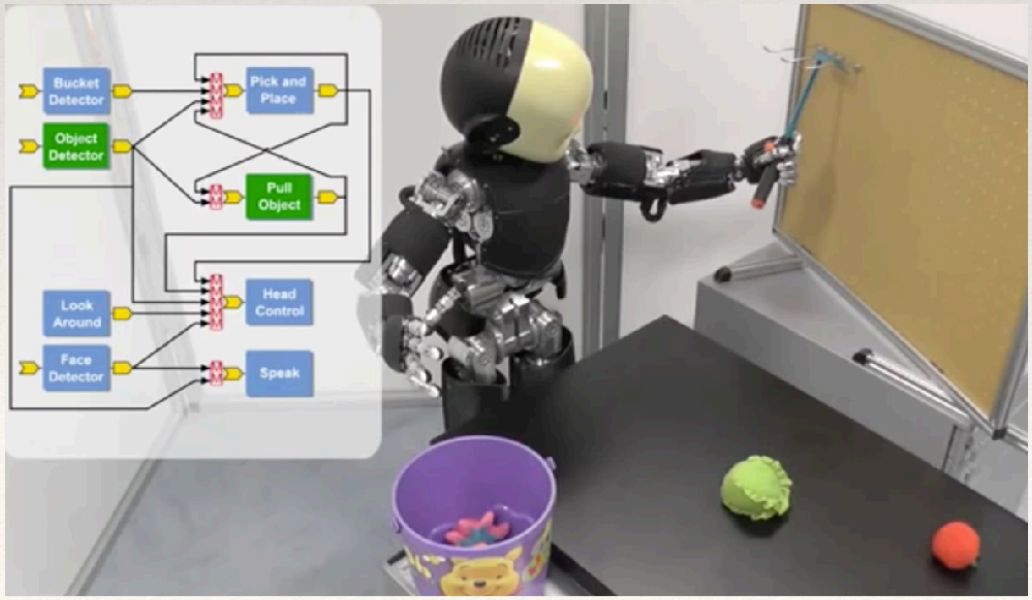
Fundamentals and Applications - 2D Vision

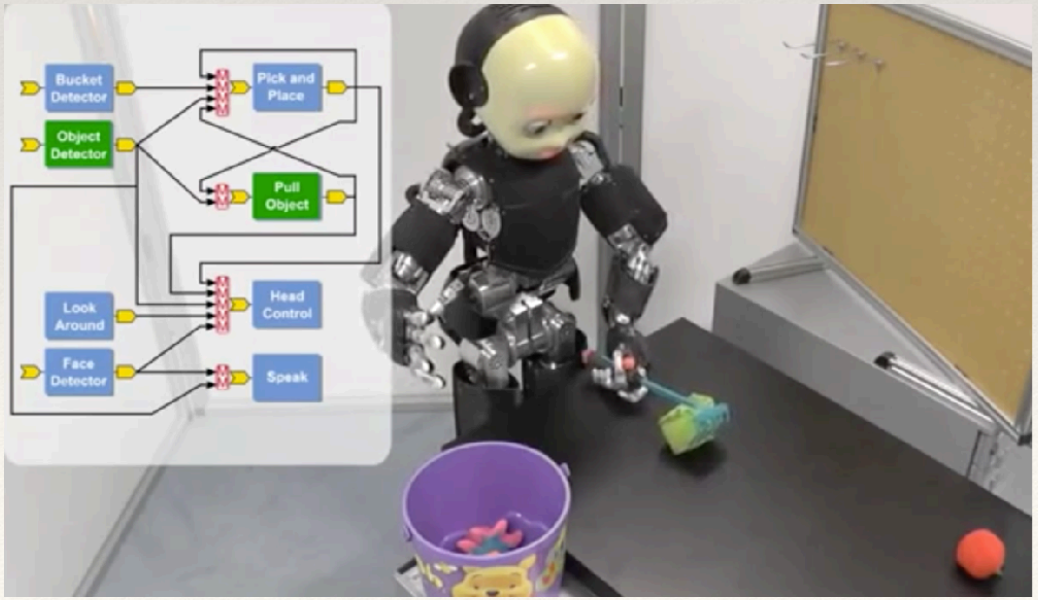


ROBOT VISION

Fundamentals and Applications - 2D Vision

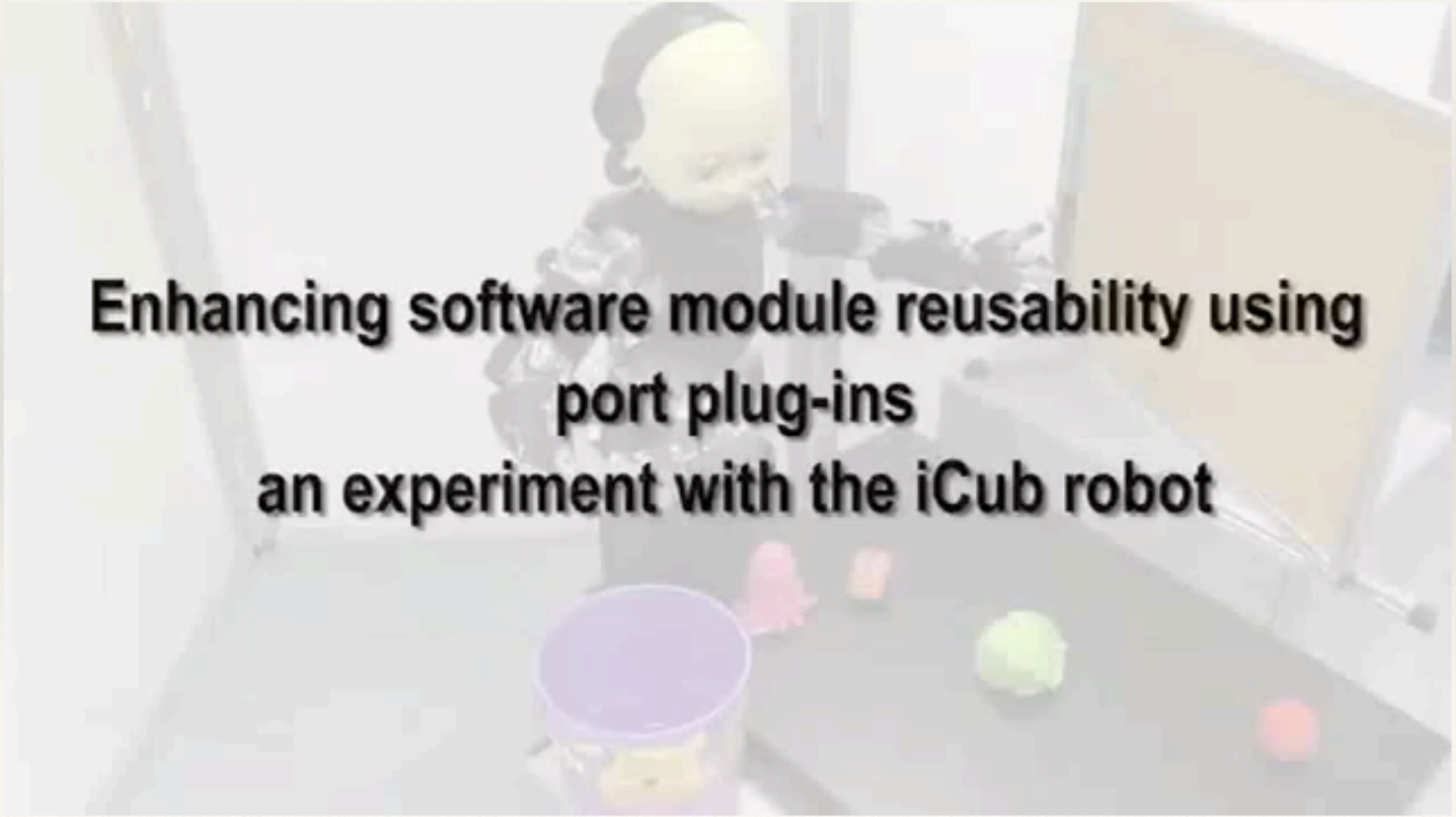






ROBOT VISION

Fundamentals and Applications - 2D Vision

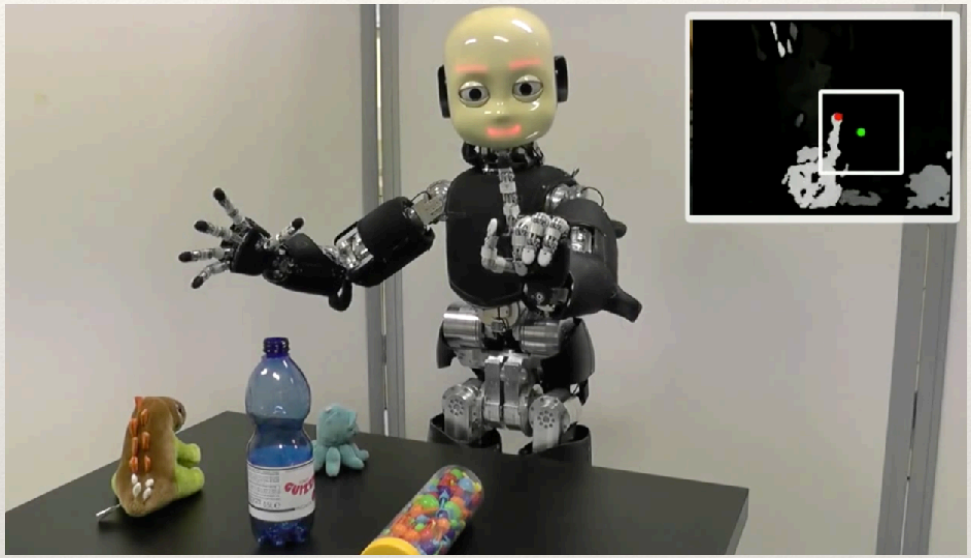


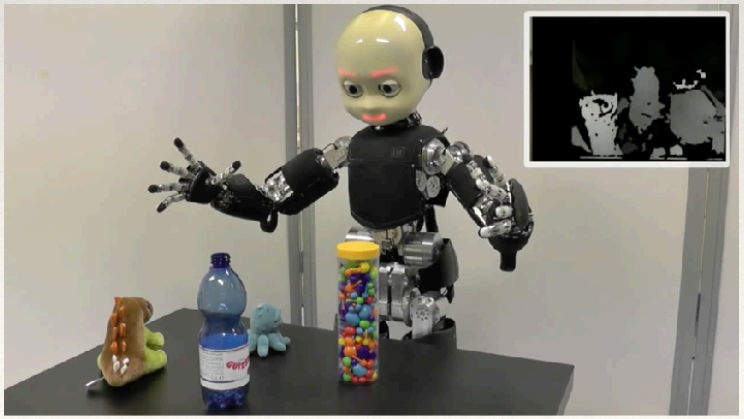
ROBOT VISION

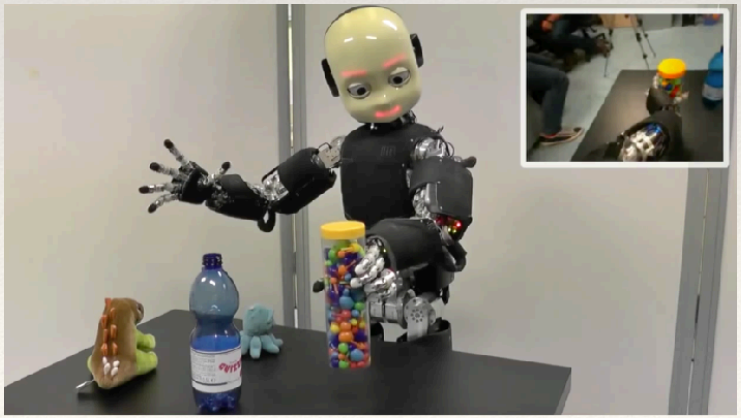
Fundamentals and Applications - 3D Vision

ROBOT VISION

Fundamentals and Applications - 3D Vision

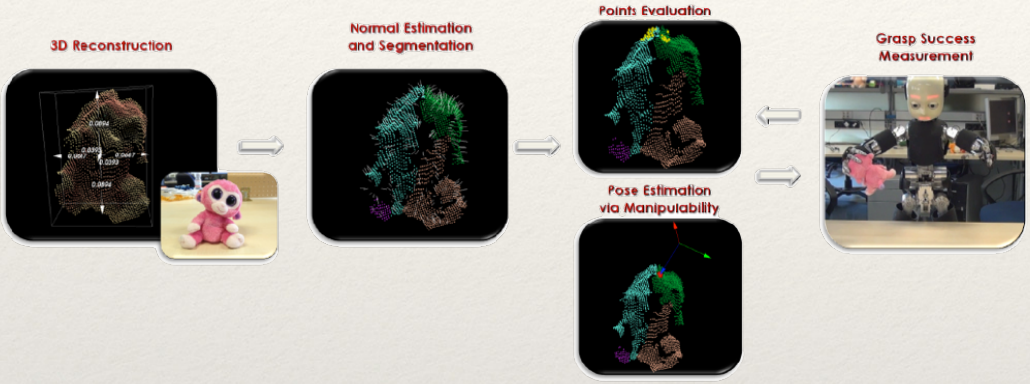


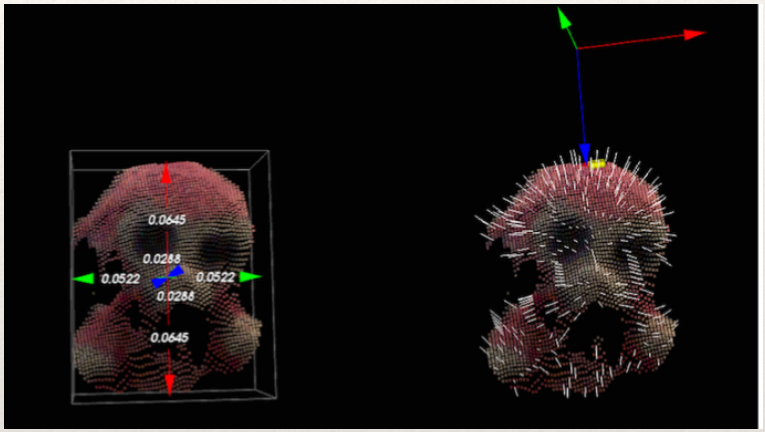


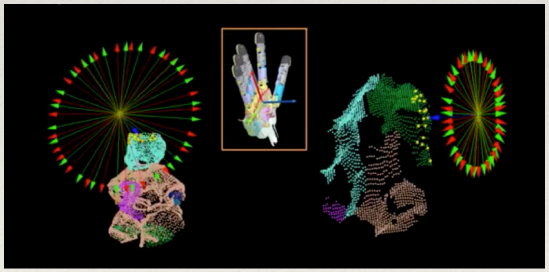


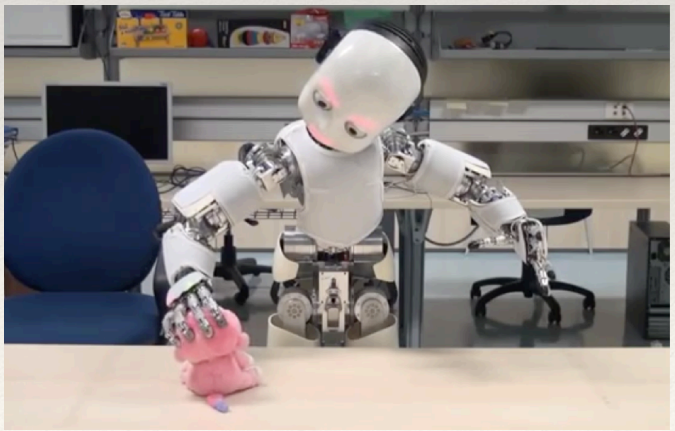
ROBOT VISION

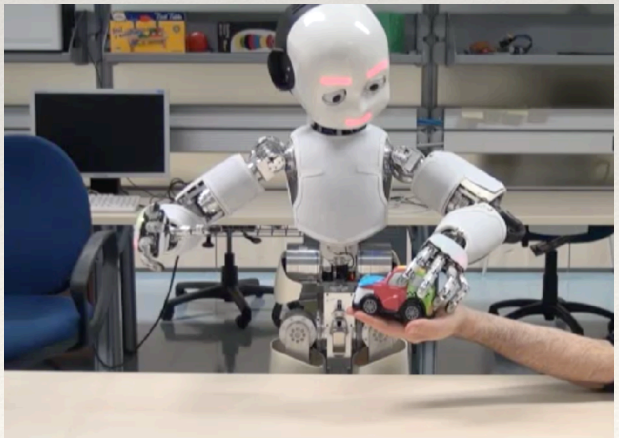
Fundamentals and Applications - 3D Vision





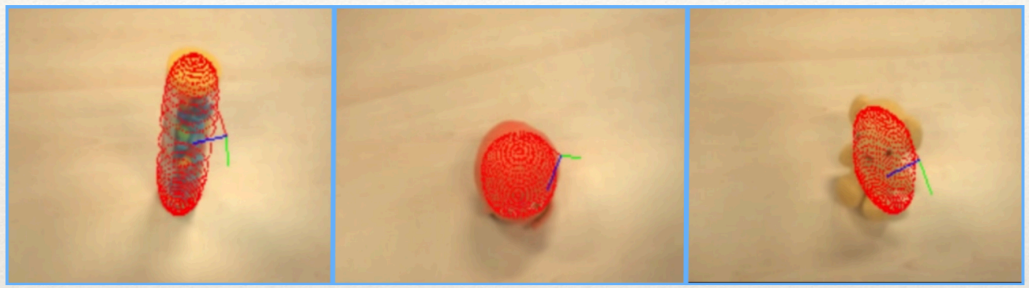






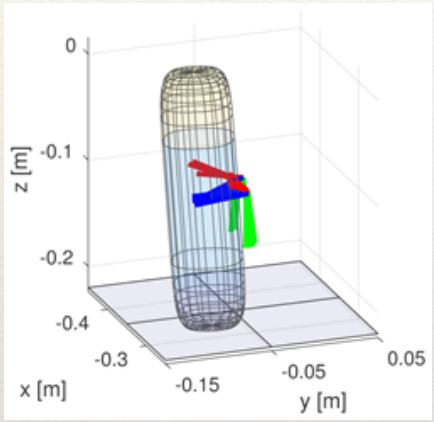
ROBOT VISION

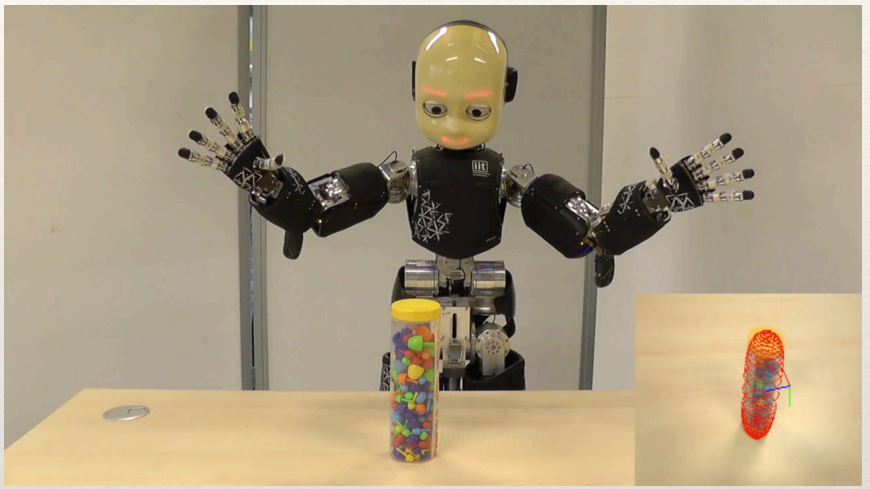
Fundamentals and Applications - 3D Vision

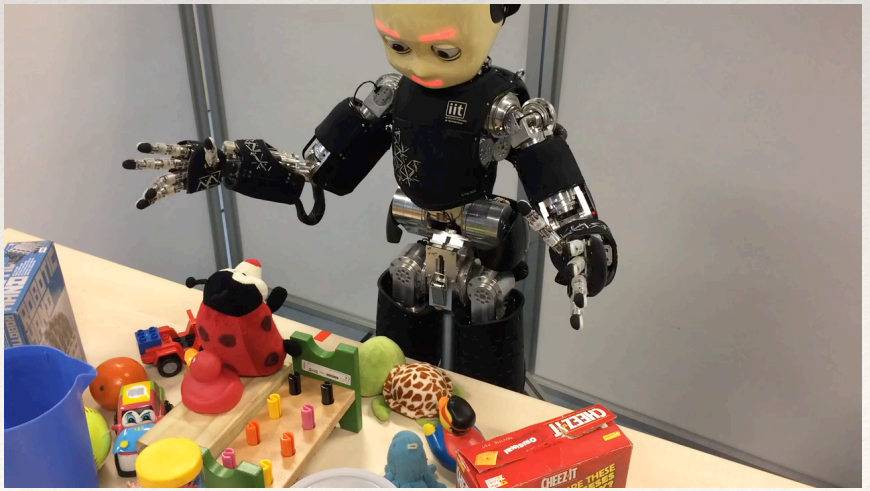


ROBOT VISION

Fundamentals and Applications - 3D Vision

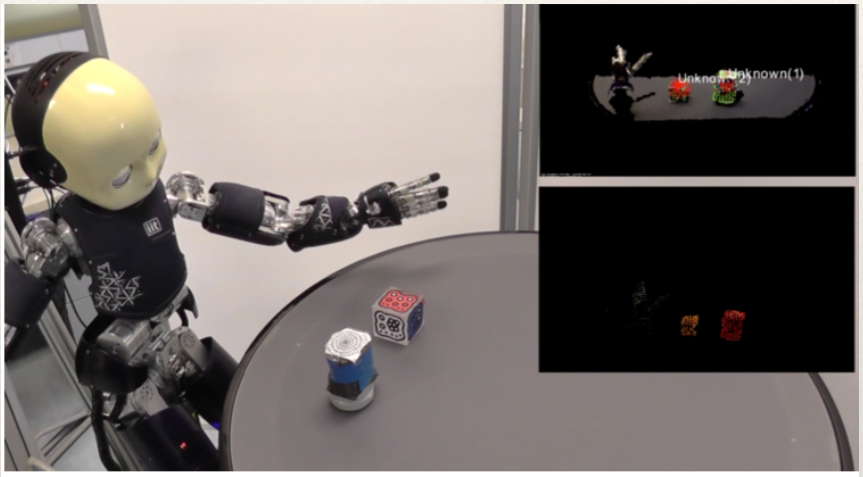


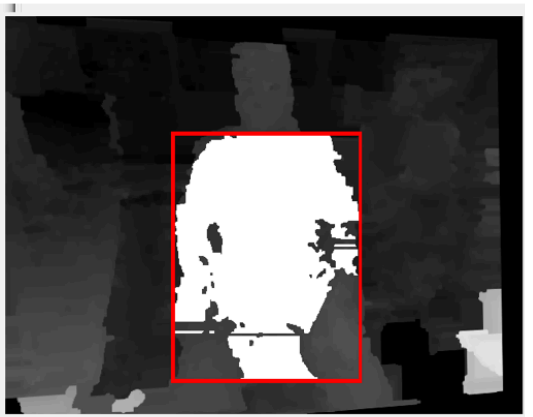




ROBOT VISION

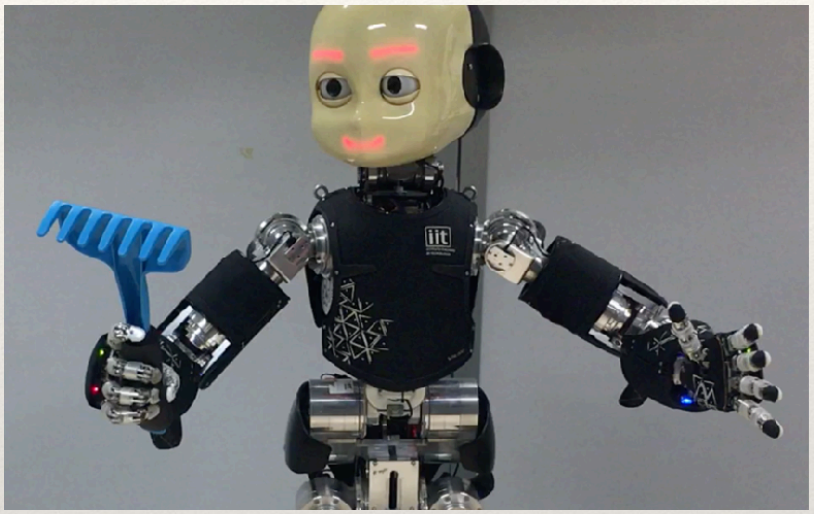
Fundamentals and Applications - 3D Vision

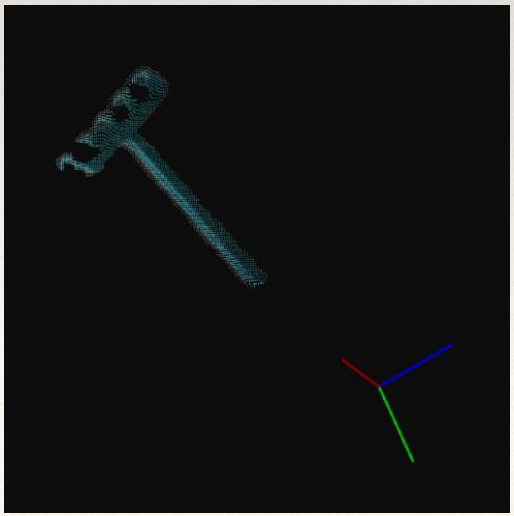


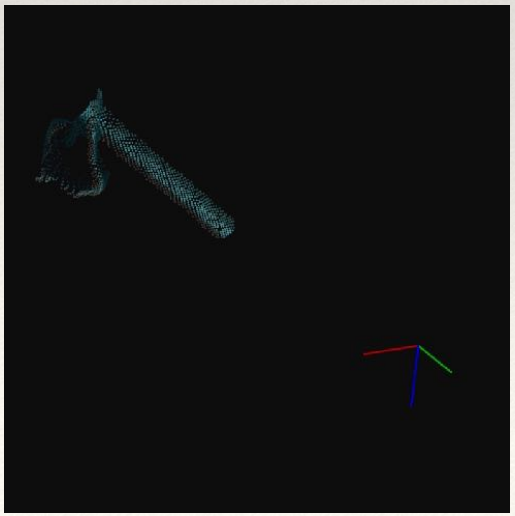


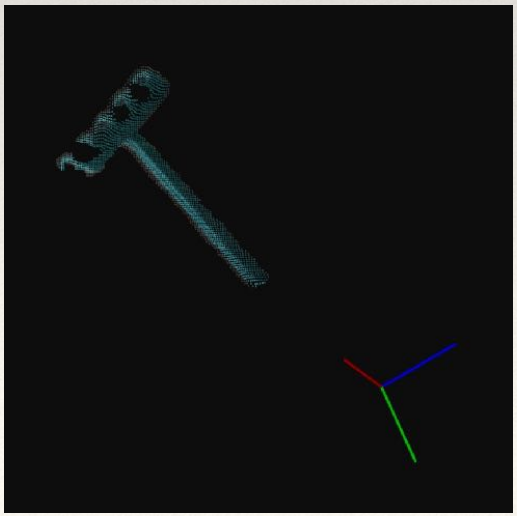
ROBOT VISION

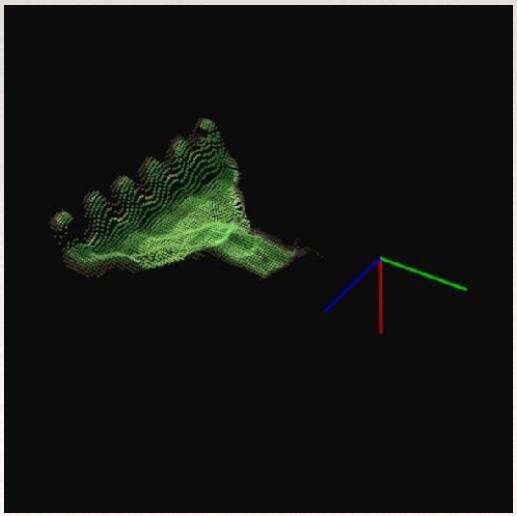
Fundamentals and Applications - 3D Vision





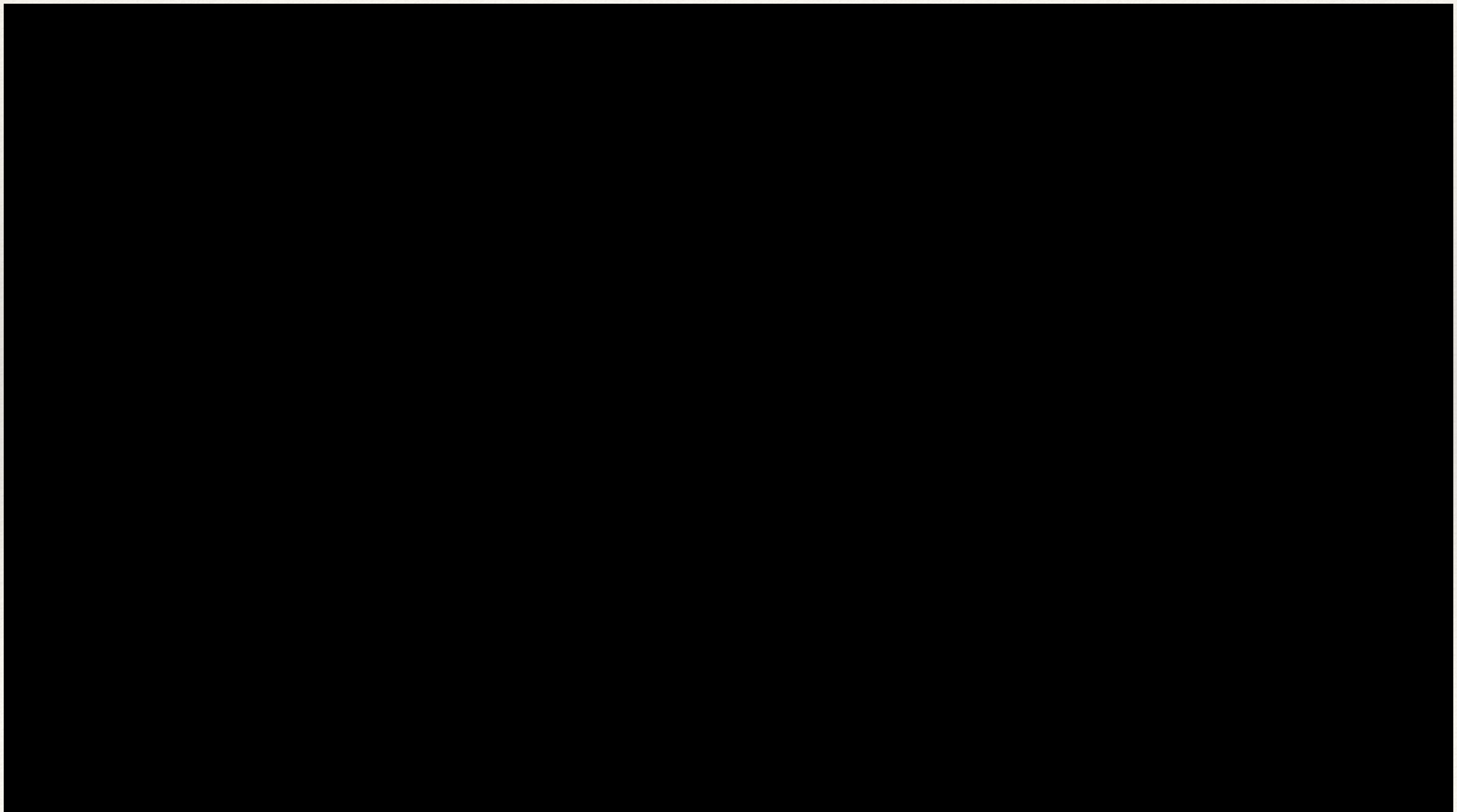




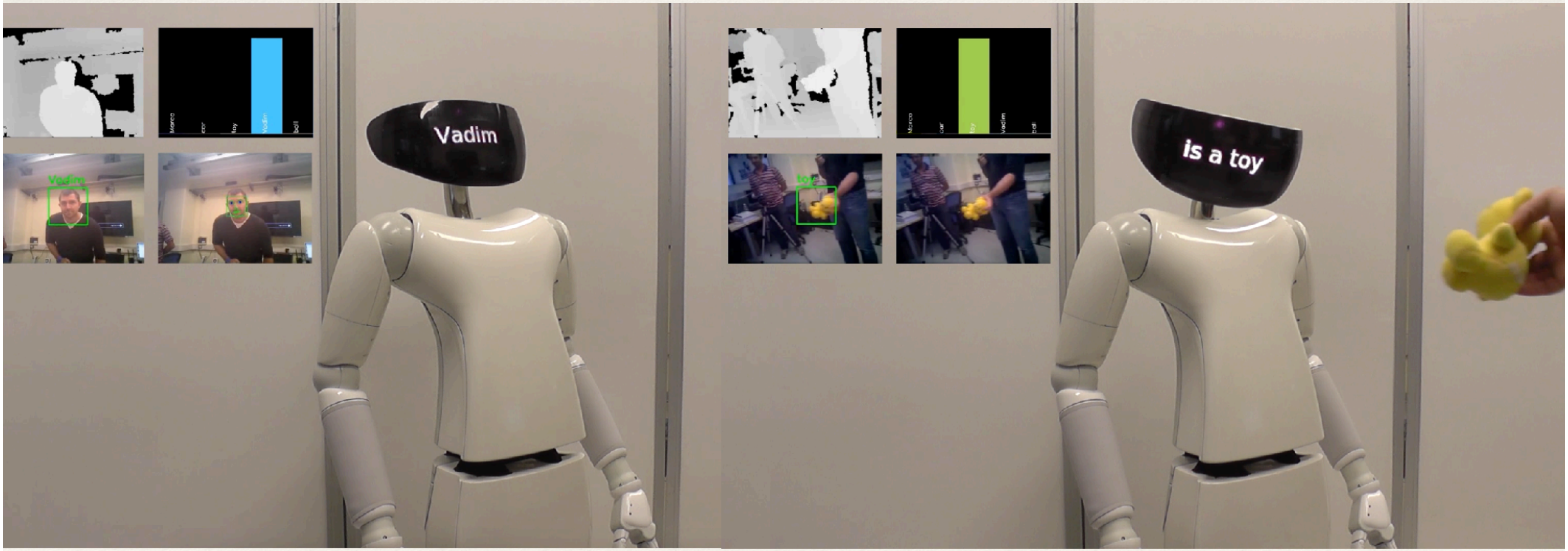


ROBOT VISION

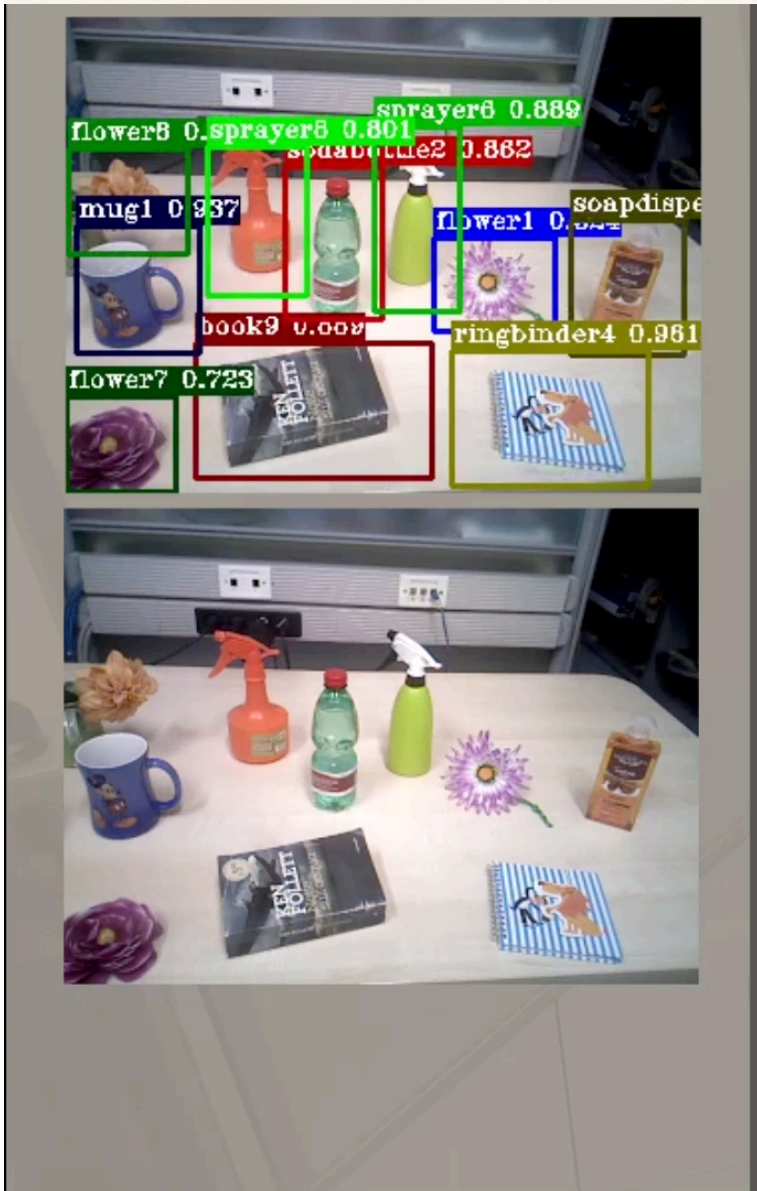
Fundamentals and Applications - 3D Vision

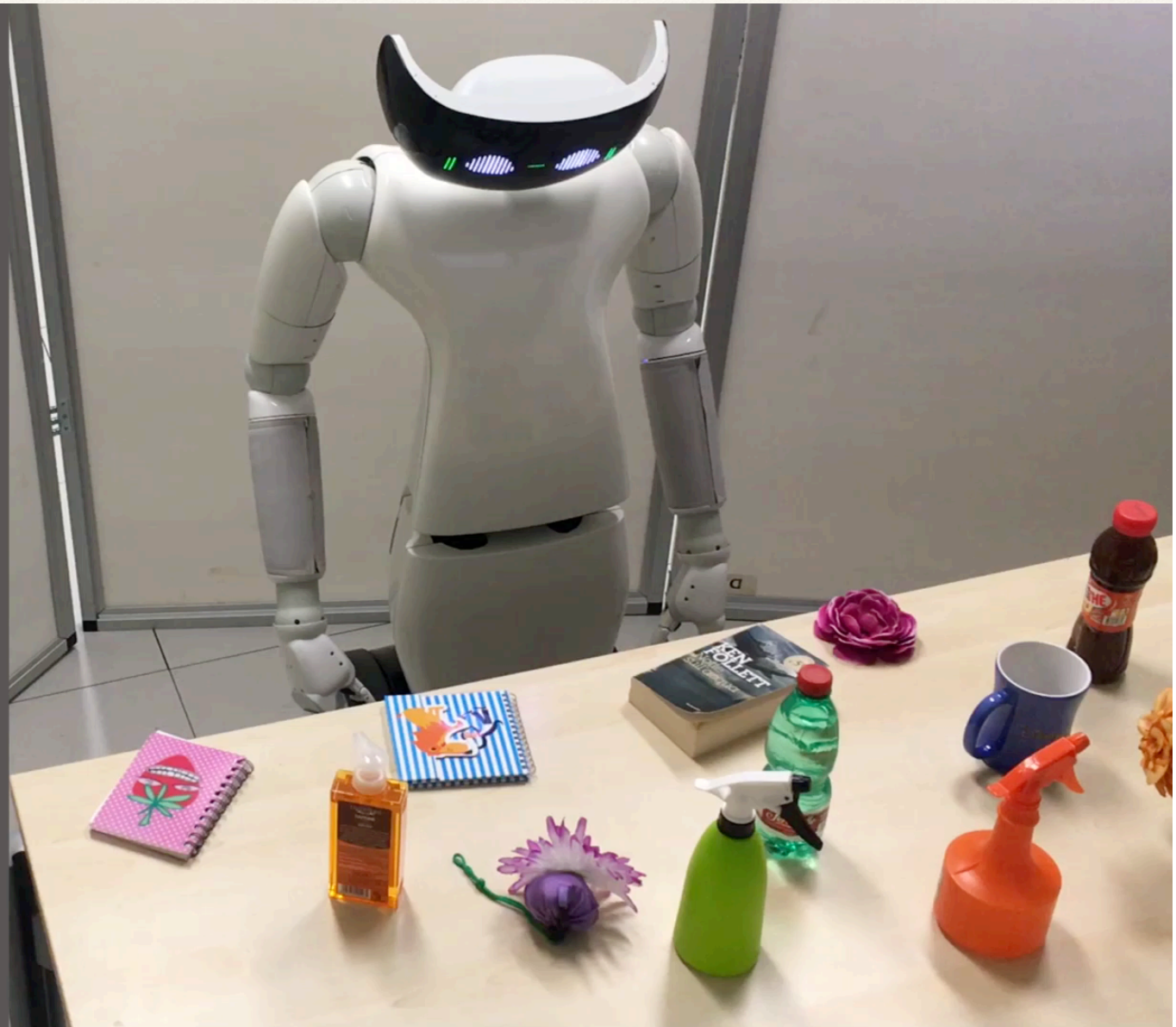


ROBOT VISION



ROBOT VISION





ROBOT VISION

Tutorials

- Tutorial #1
  - Load Image
  - Image processing
  - Send results/images through YARP
- Tutorial #2
  - Play with stream of images
  - Image processing
  - Detect a red ball from images
  - Send results / images through YARP

- Assignment #1
  - Find Closest Blob
  - Images processing
  - Play with streams of images
  - Extract closest blob