

Course Introduction



Hi!

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- Computer science researcher and educator specializing in machine learning applications for healthcare.
- <https://www.liaou.xyz/>

Course Introduction

- What is computer vision?
- Course fast-forward and logistics

What is
computer vision?



Photo by Svetlana Lazebnik

What a person sees

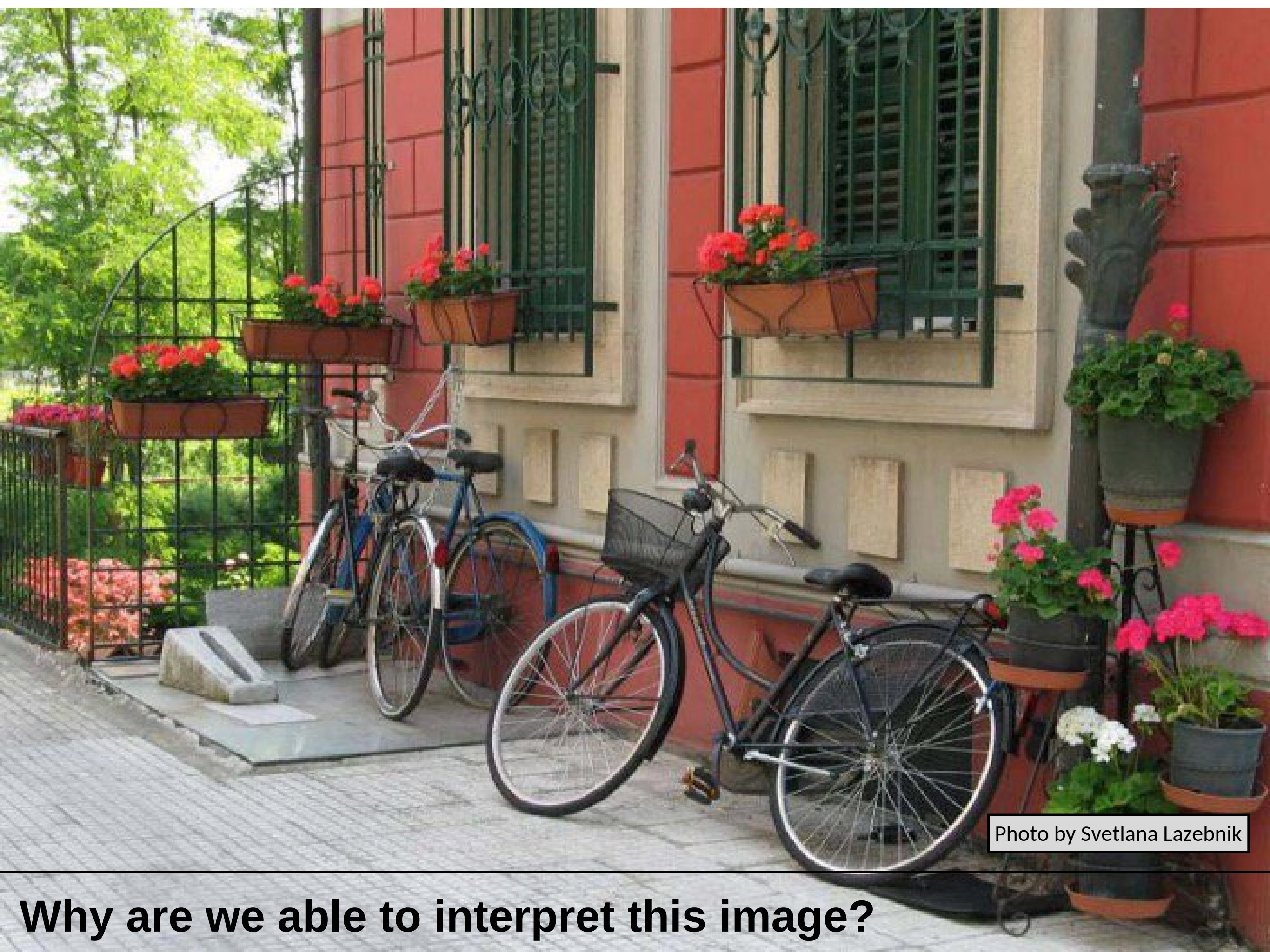
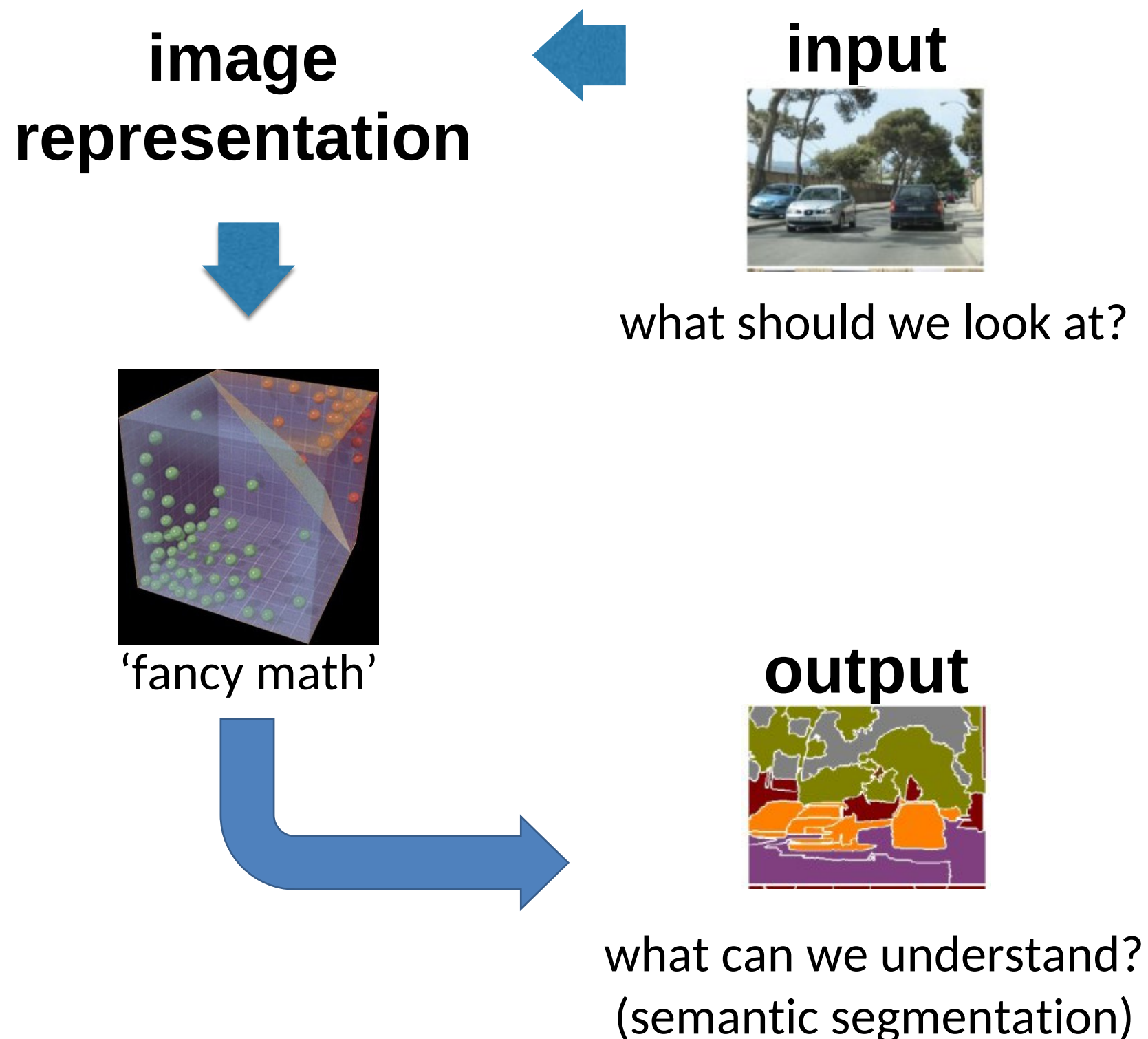


Photo by Svetlana Lazebnik

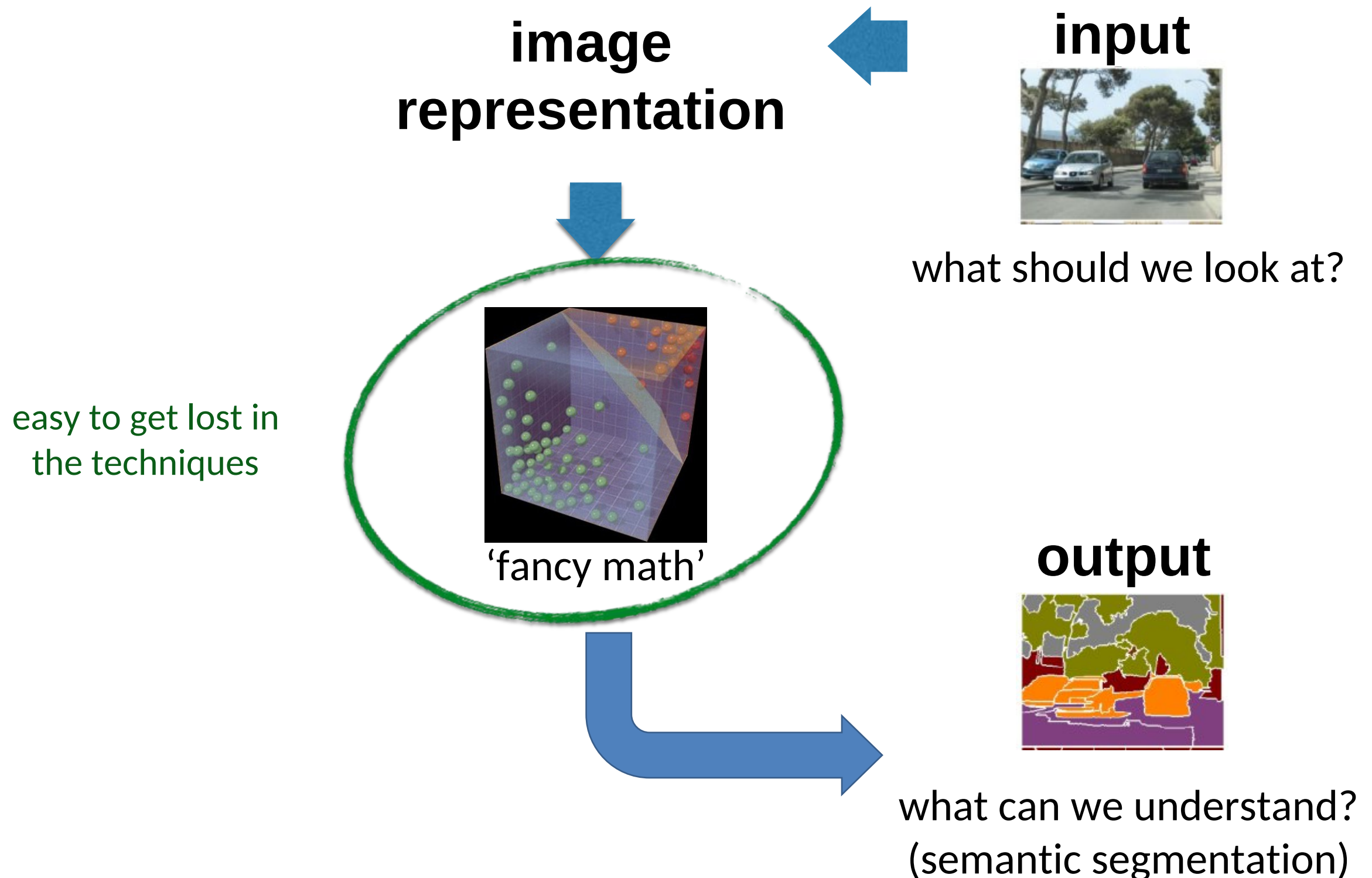
Why are we able to interpret this image?

The goal of computer vision is
to give computers
(super) human-level perception

Typical perception pipeline

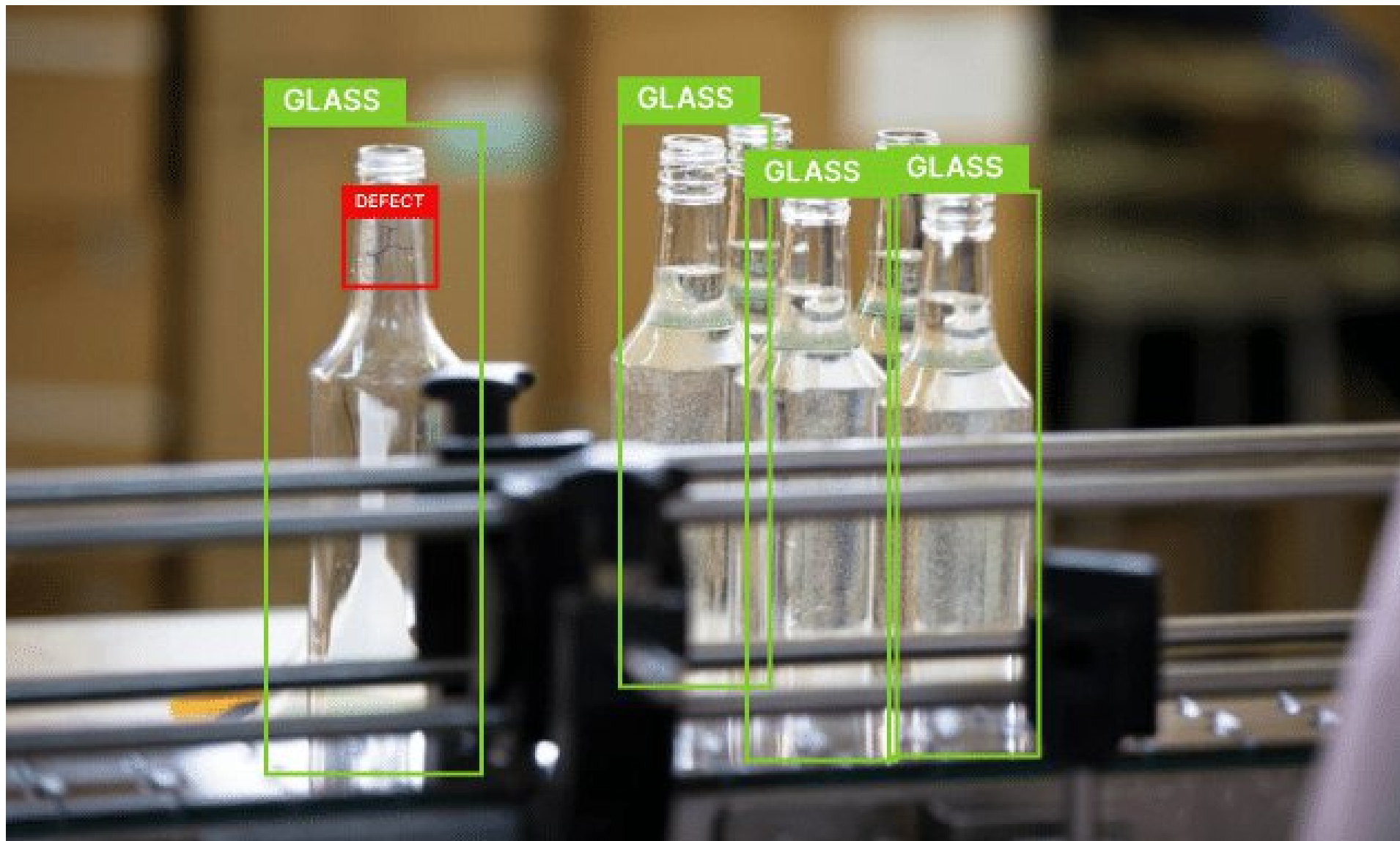


Typical perception pipeline



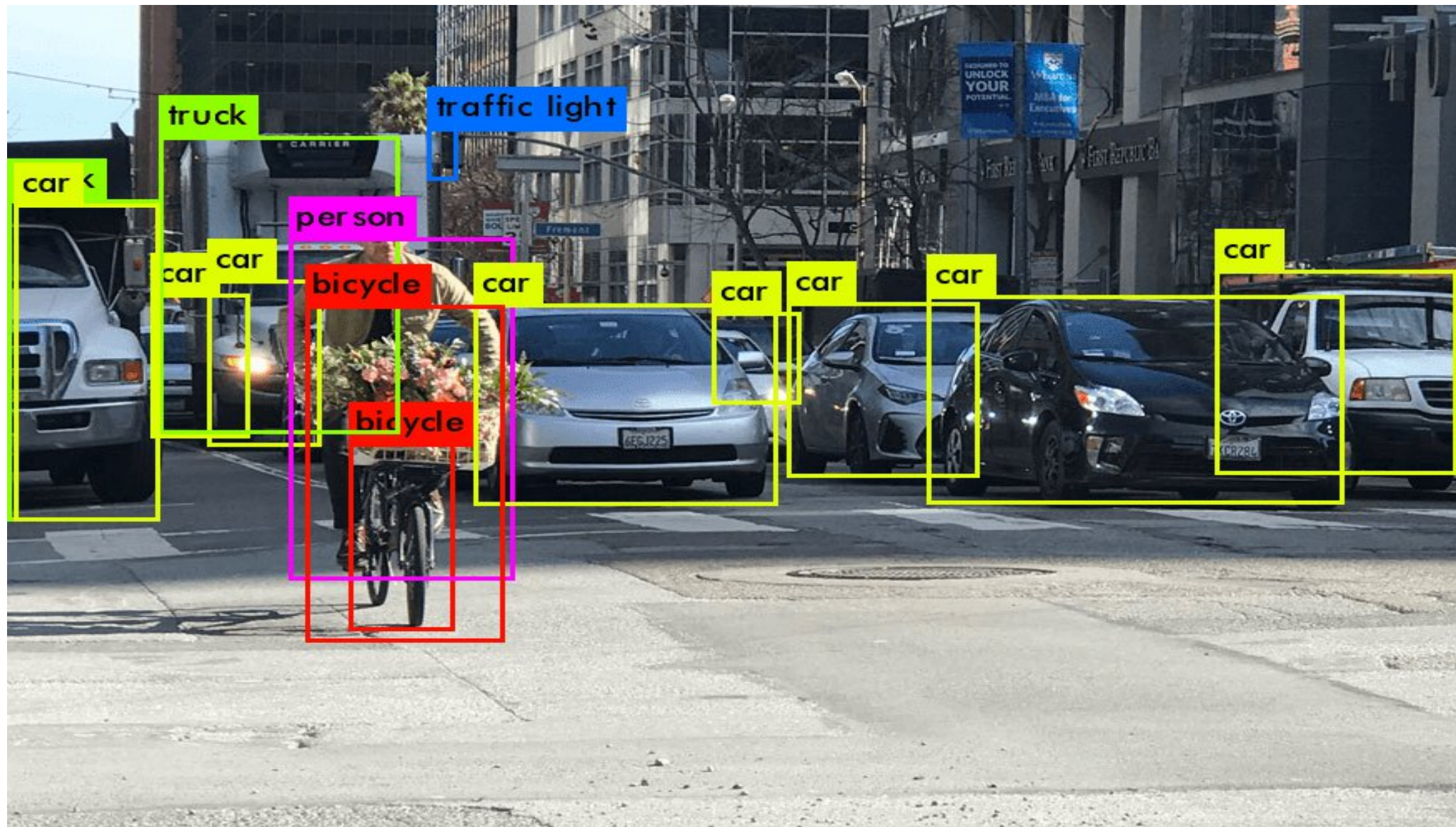
Applications of computer vision

Computer Vision in Industry



e.g. Automated visual inspection

Computer Vision in Transportation



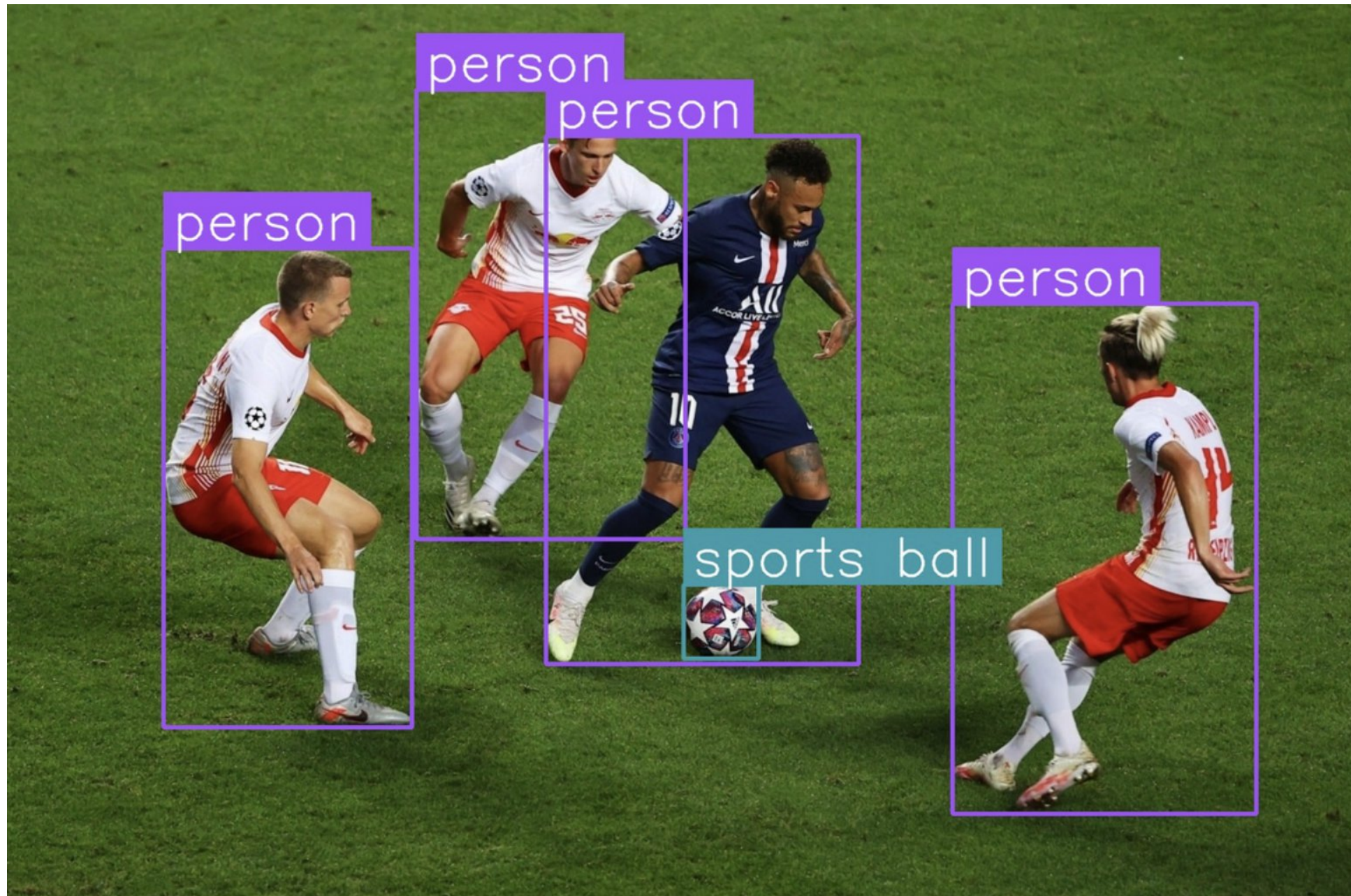
e.g. Object Recognition and Traffic Management

Computer Vision in Biometrics



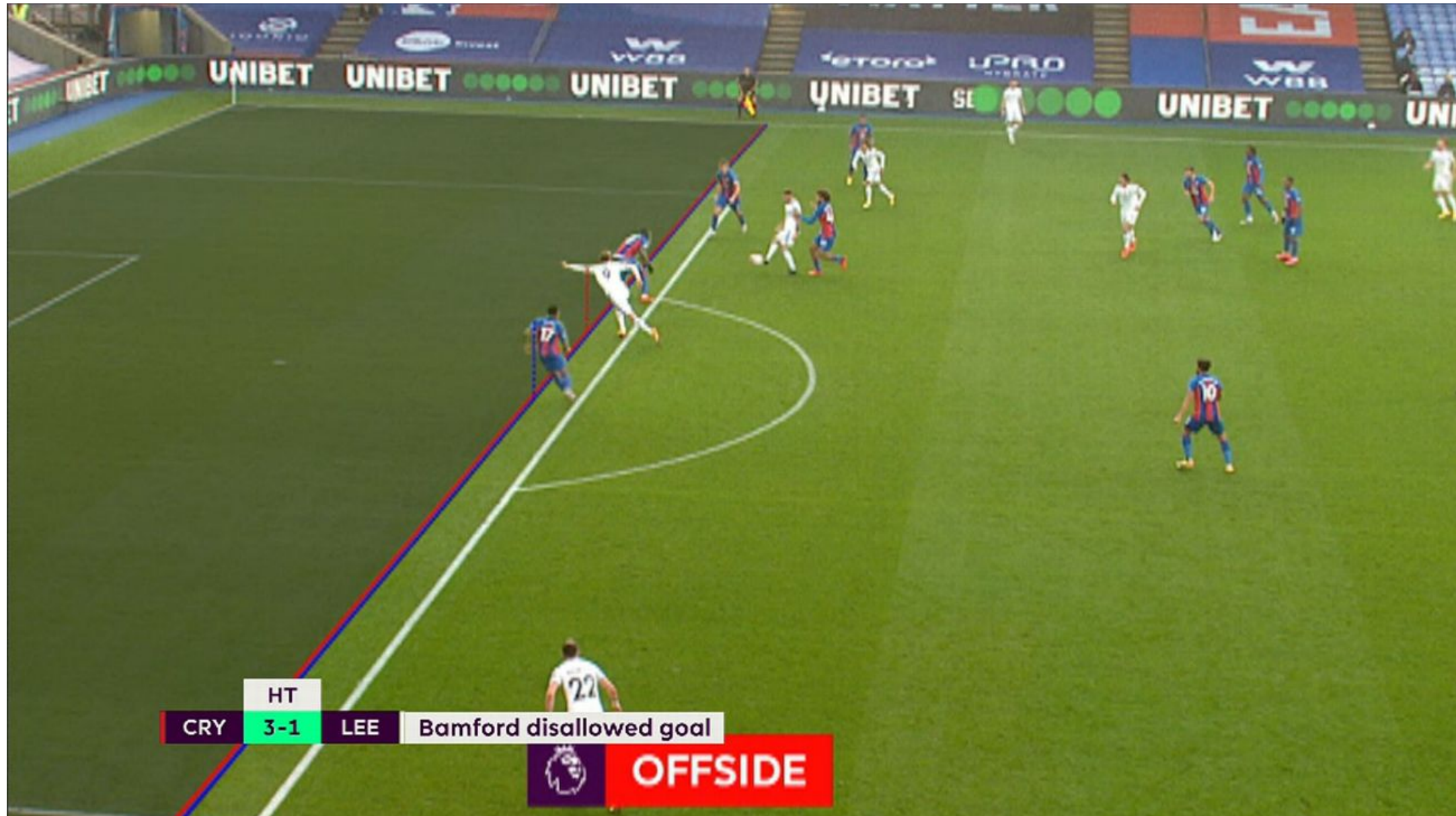
e.g. Face ID

Computer Vision in Sports



e.g. Player and Ball Tracking

Computer Vision in Sports



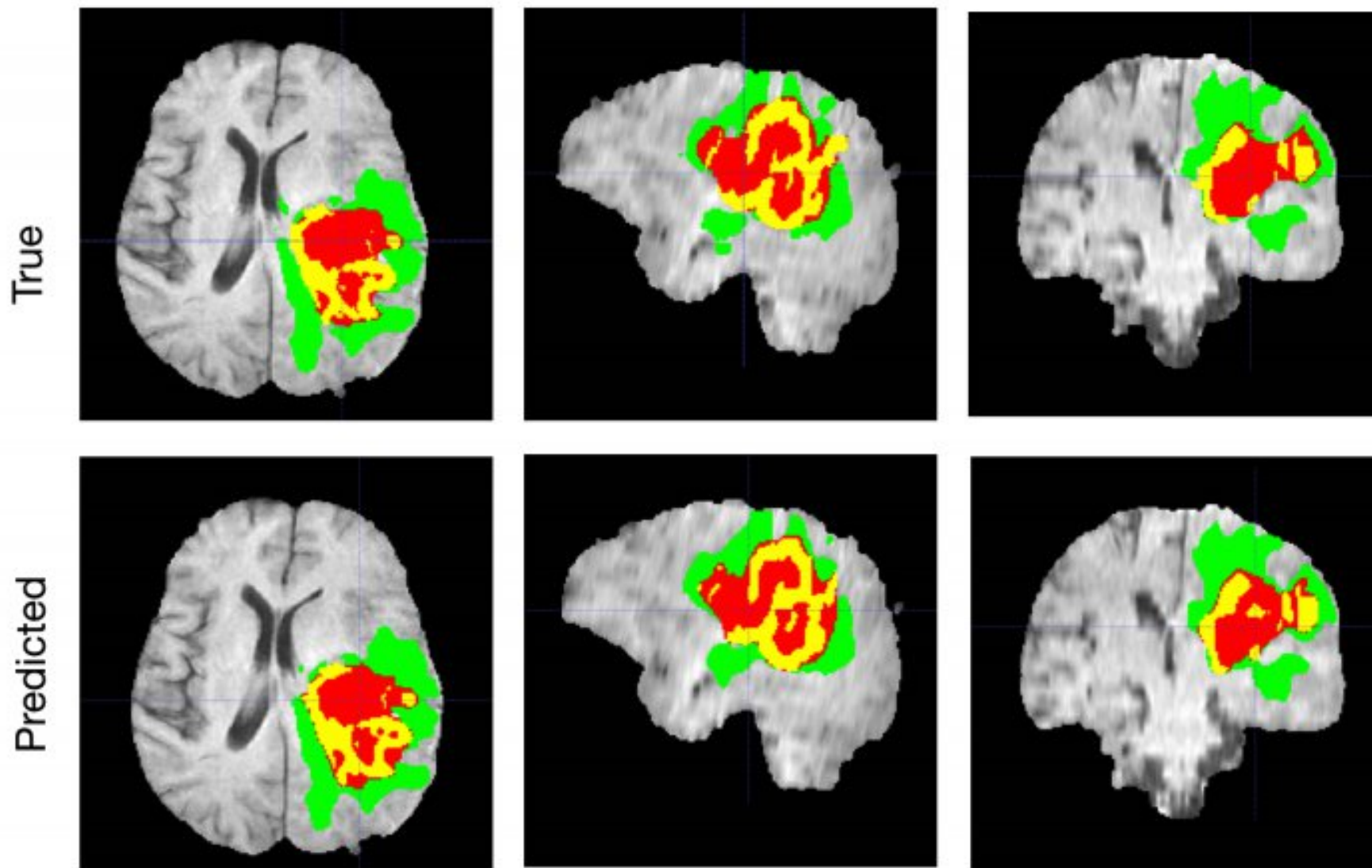
e.g. Video assistant referee (VAR)

Computer Vision in Agriculture



e.g. Detecting Plant disease

Computer Vision in Healthcare



e.g. Brain tumor segmentation with AI

Computer Vision in Cars

BIMMERTODAY



BMW 5/6/7 series

e.g. BMW night vision



Computer Vision in Cars



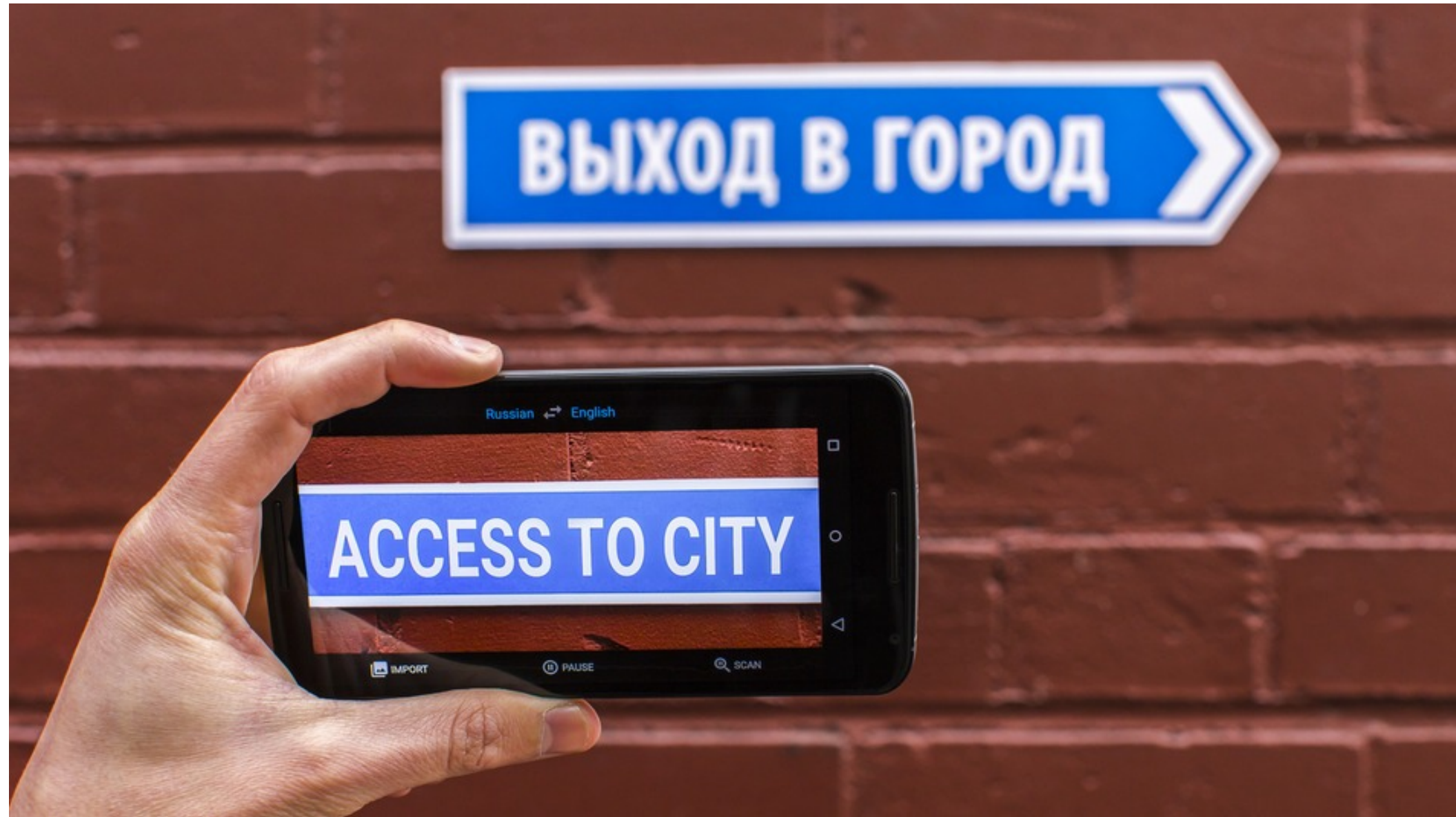
e.g. Automated Parking

Computer Vision for VR/AR



e.g., Pokemon GO

Computer Vision in Smartphones



e.g., Google Translate

Computer Vision in Arts



e.g., Style Transfer

Computer Vision for Visual Effects



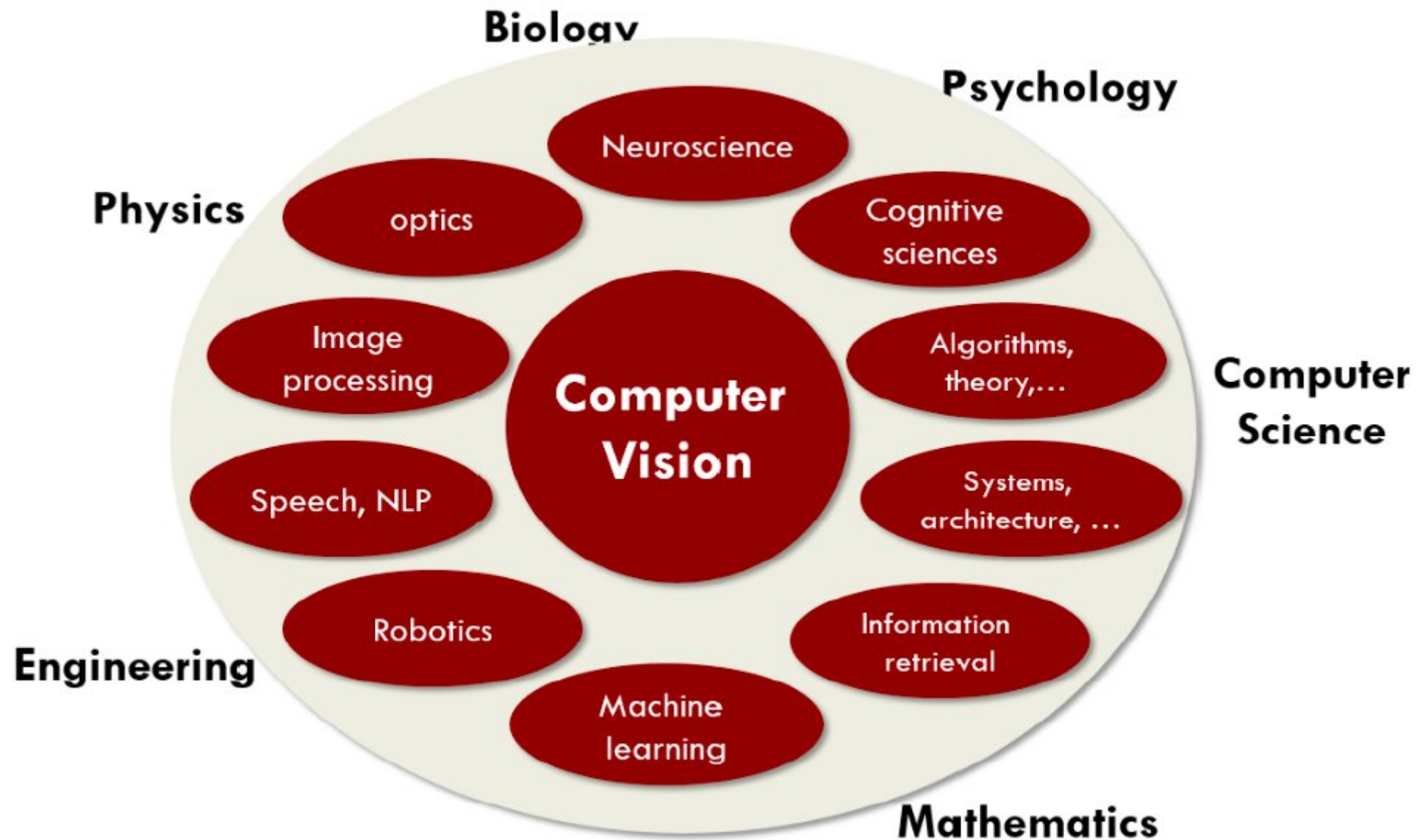
e.g., Hollywood Movies

It's a good time to do
computer vision



Industry aggressively hiring CV graduates

CV at the intersection of multiple disciplines

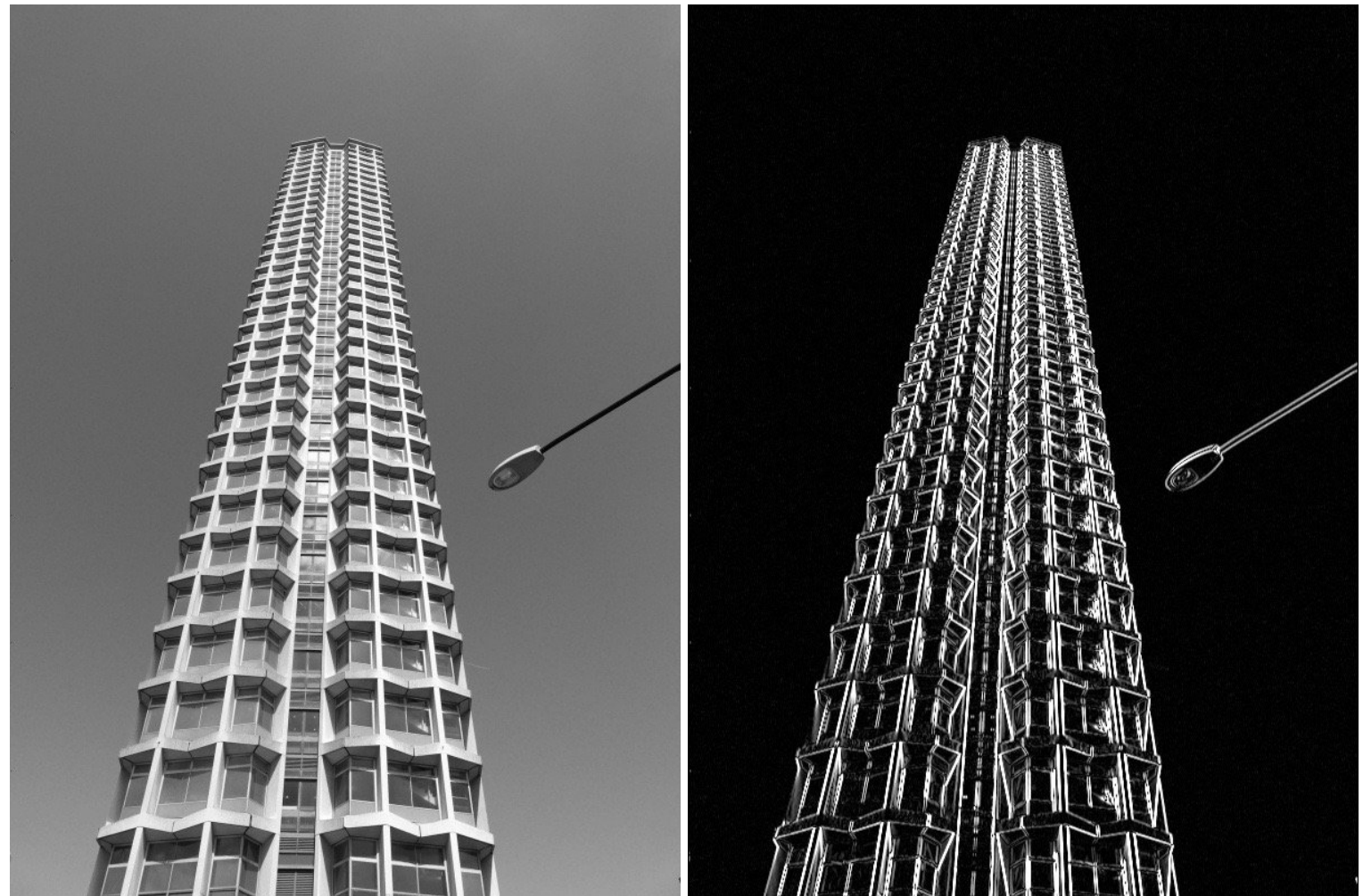


Course logistics

Topics to be covered (Tentative)

Image processing:

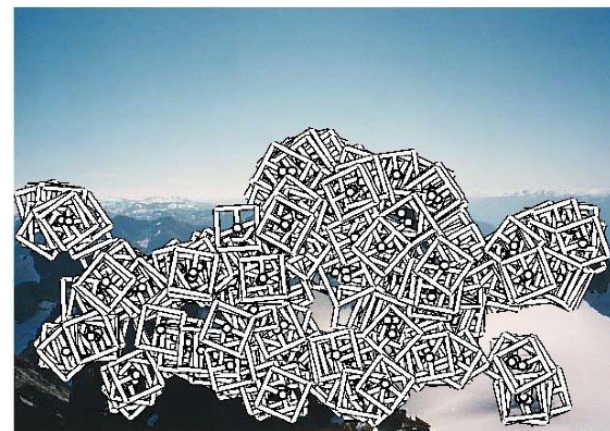
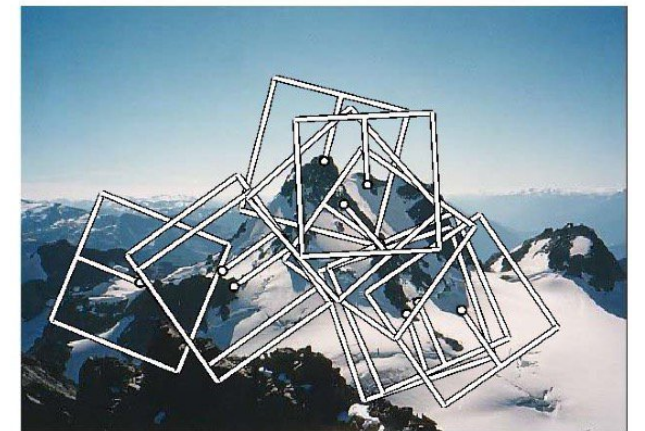
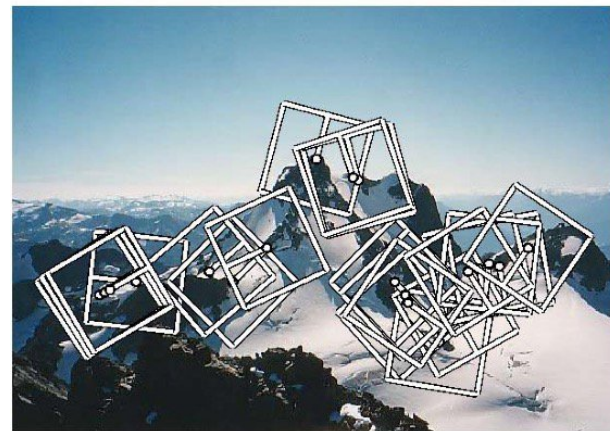
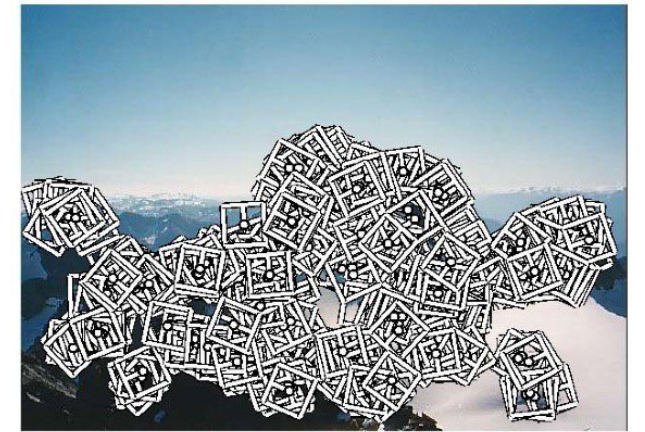
- Point Processing
- LSIS and Convolution
- Image Filtering
- Fourier Transform



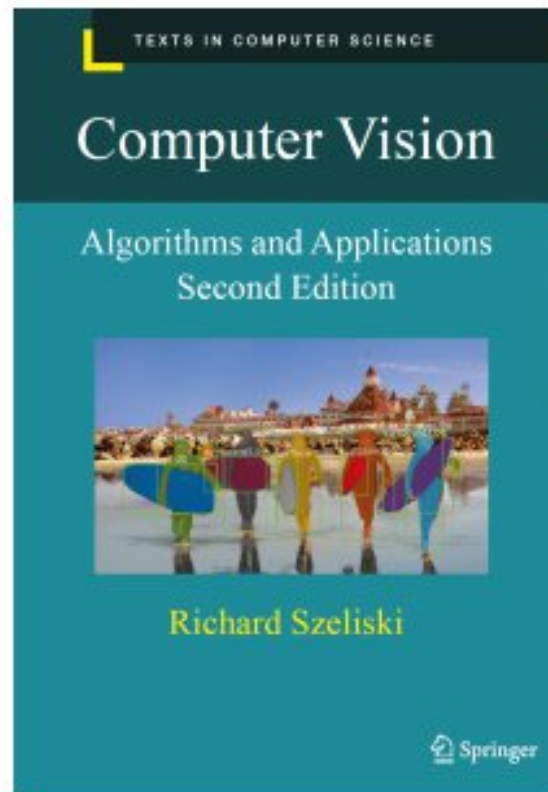
Topics to be covered (Tentative)

Feature detection and correspondences:

- Edge detection
- Boundary detection
- SIFT detector



Free Book



PDF online

<http://szeliski.org/Book/>

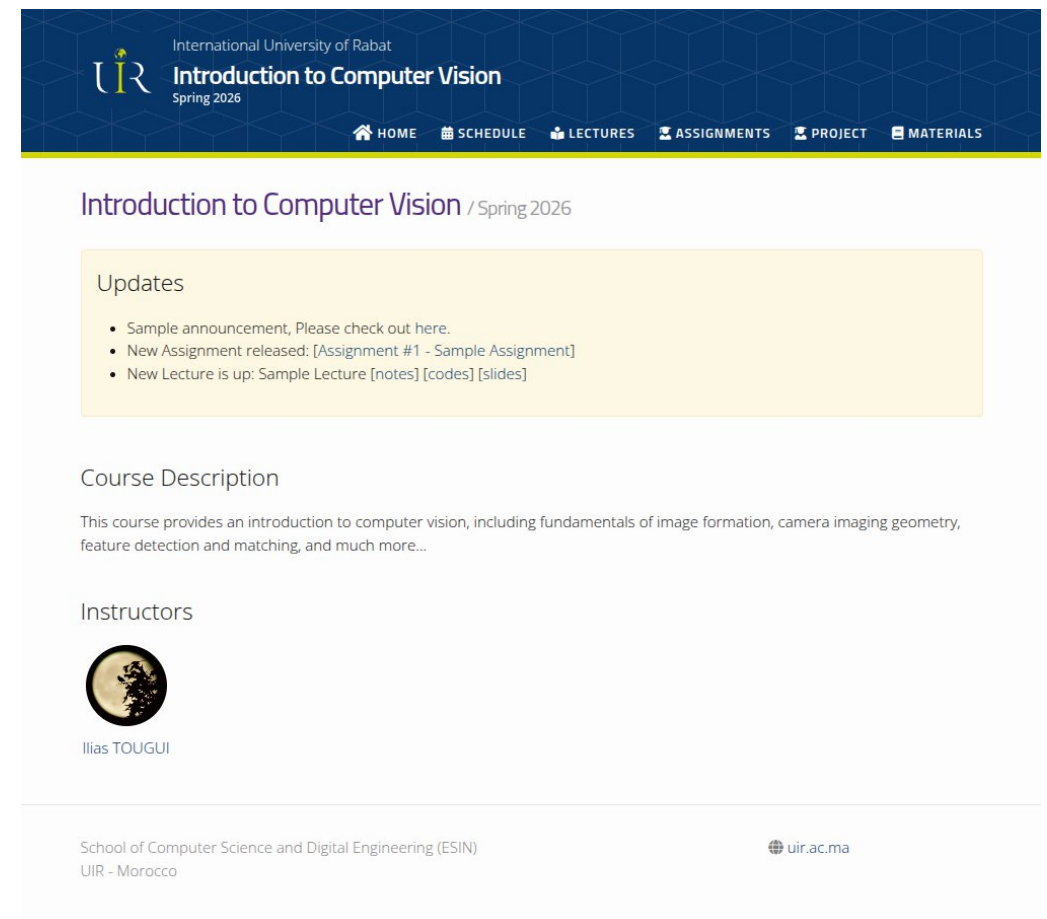
Course Websites

<https://liaoux.github.io/uir-cv-2026/>

- Lecture slides
- Lab documents
- Suggested Readings
- Final Project Description

<https://connect.uir.ac.ma/>

- Labs / Project submissions



Grading Policy

The grading is based on:

- 5 Labs / Assignments (individually)
- 1 Final Project (mid-term) (in groups of 2)
- Final Exam