



Therapy (from 12.00 PM)

05-12-17 - TUE → Surgery-2
05-12-17 - THU → Surgery-2
07-12-17 - SAT → Medicine-2
07-12-17 - MON → Medicine-2
11-12-17 - WED → O&G Surgery-I
13-12-17 - FRI → O&G Surgery-II
14-12-17 - MON → Pediatrics

What is wrong with this image?

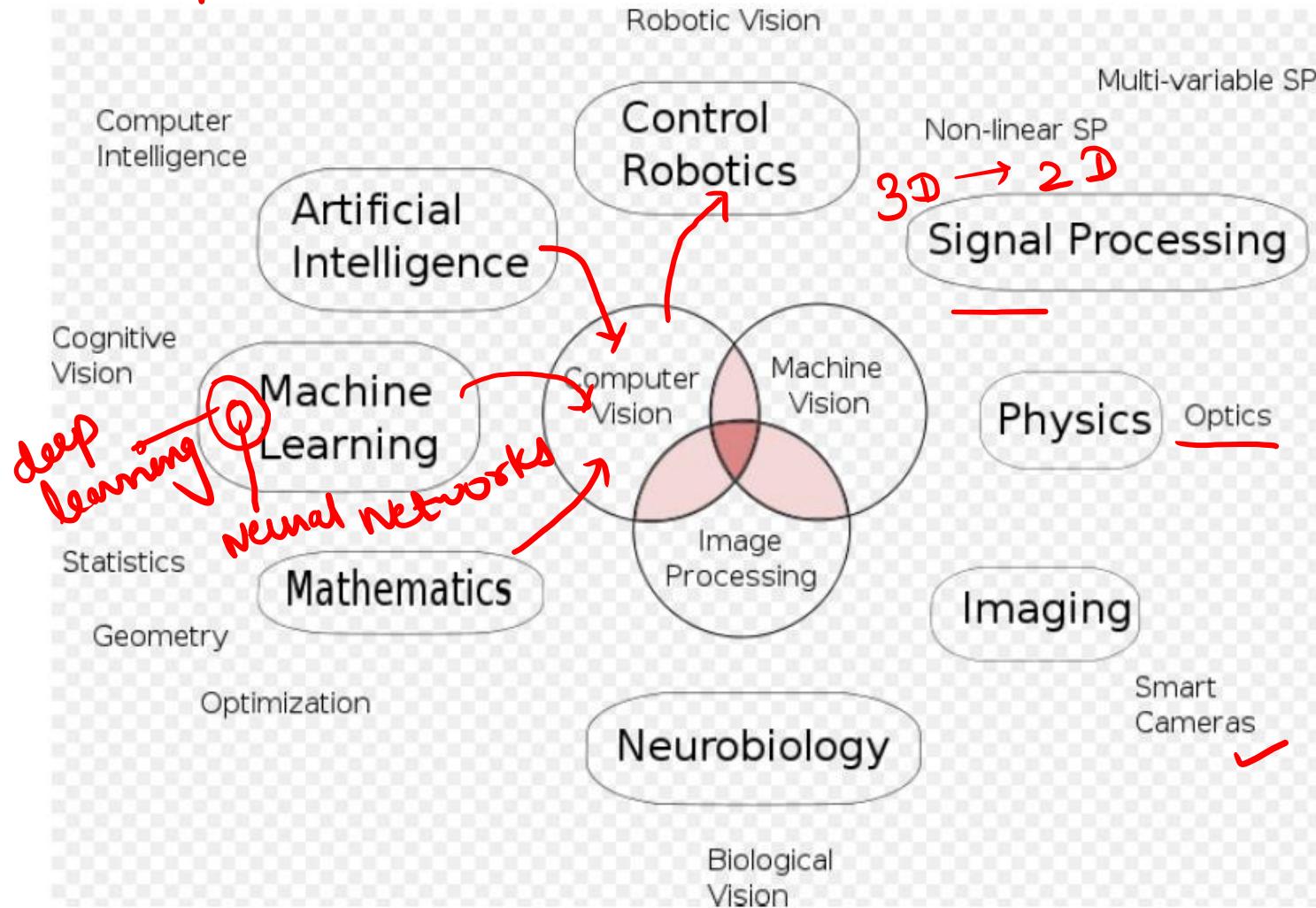


Computer Vision

Computer vision automates computing framework with the ability to interpret images the way humans do.

It is sub-topic of Artificial Intelligence.

Computer vision Related Domains



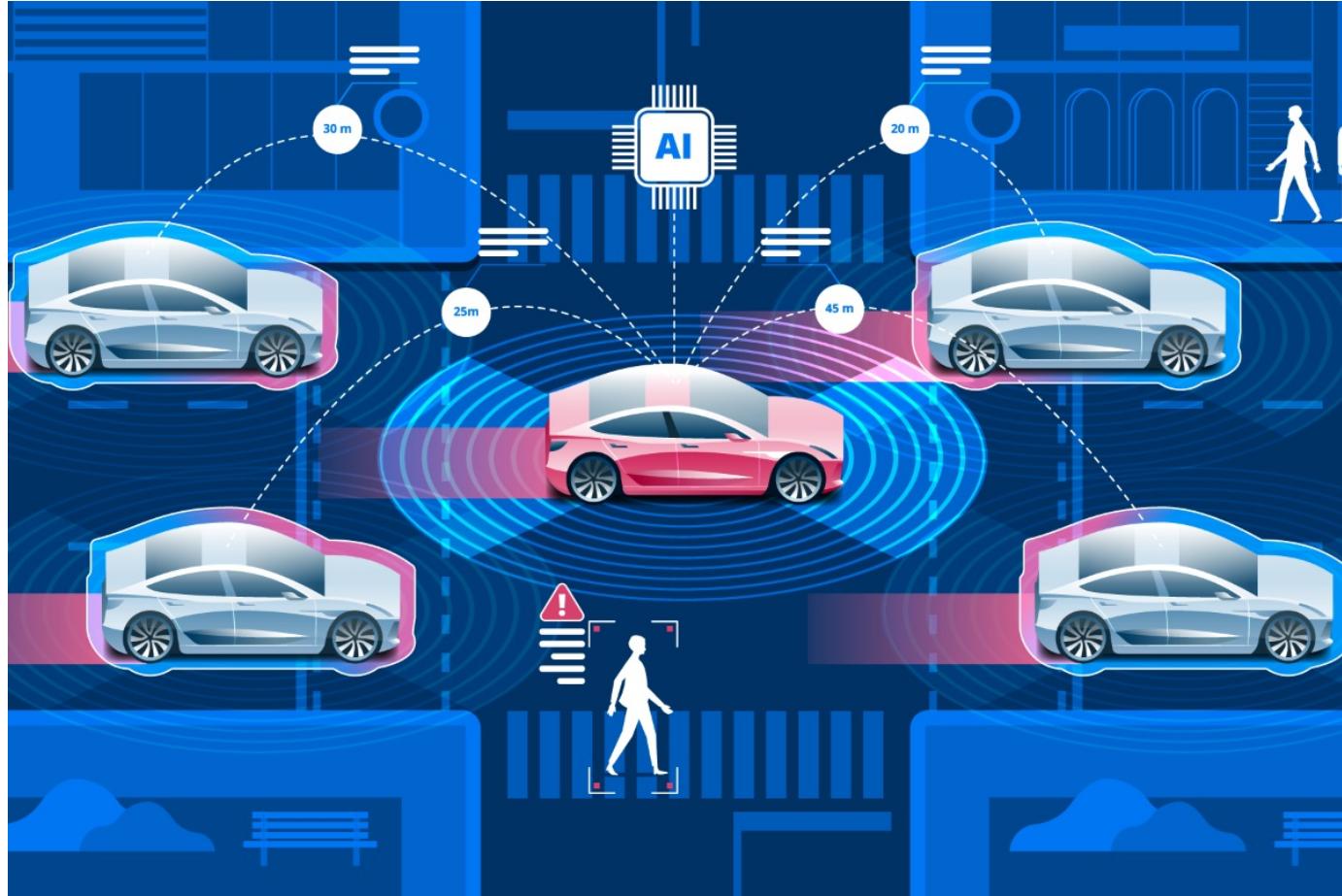
Computer vision course objective

- what to expect (what ability)
- why we need to study this particular course (importance)

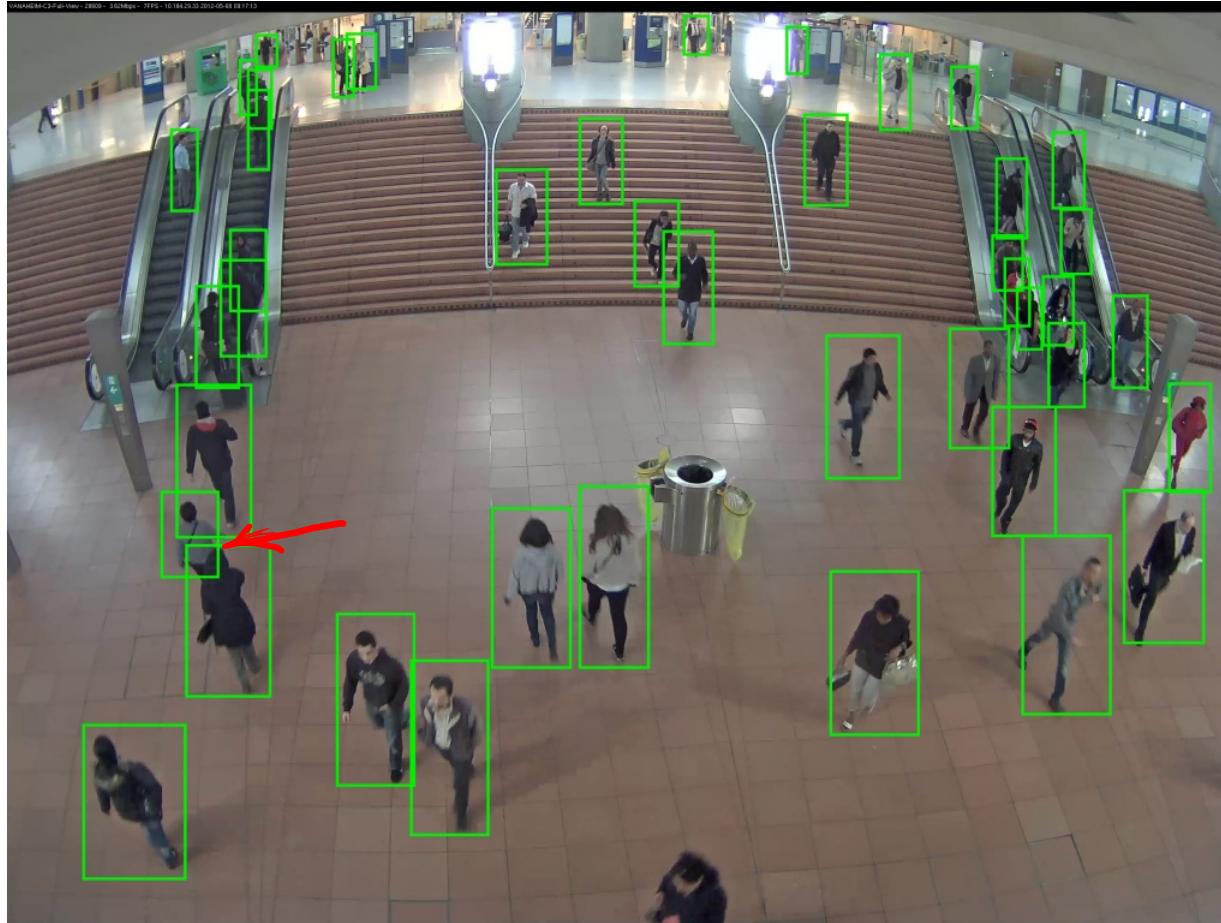
Applications of
Computer Vision

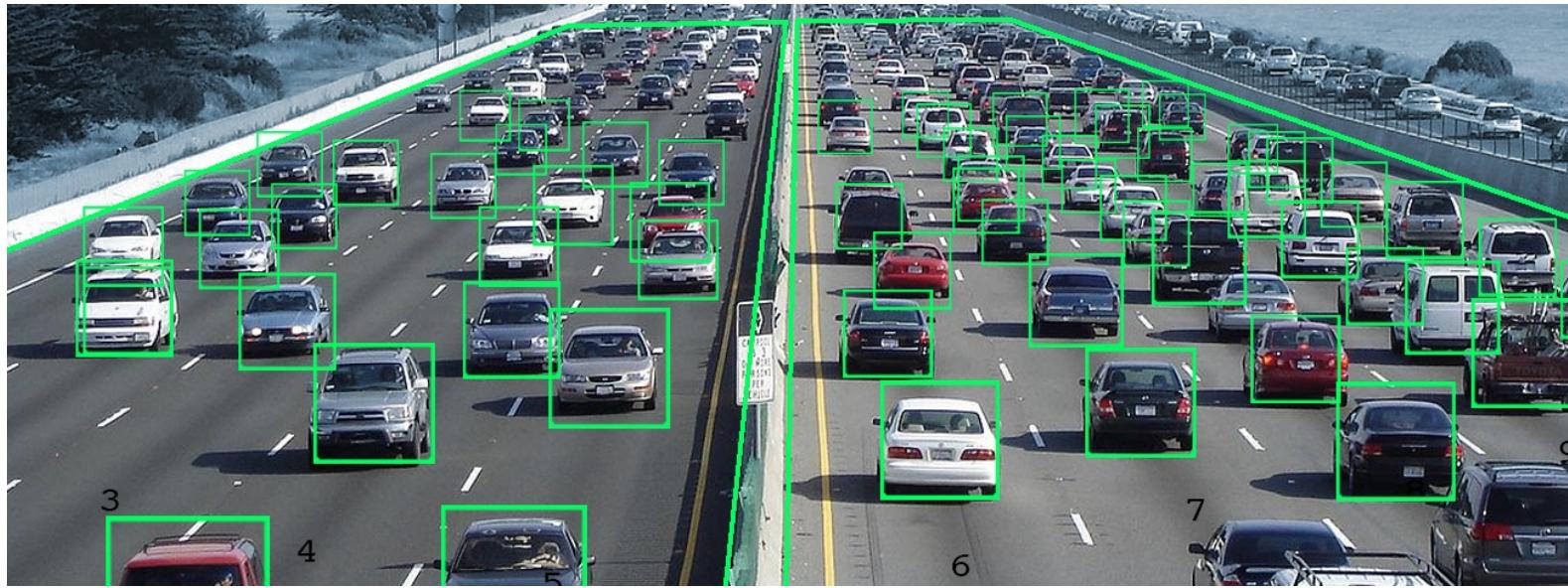
① Self-driving cars





② Surveillance





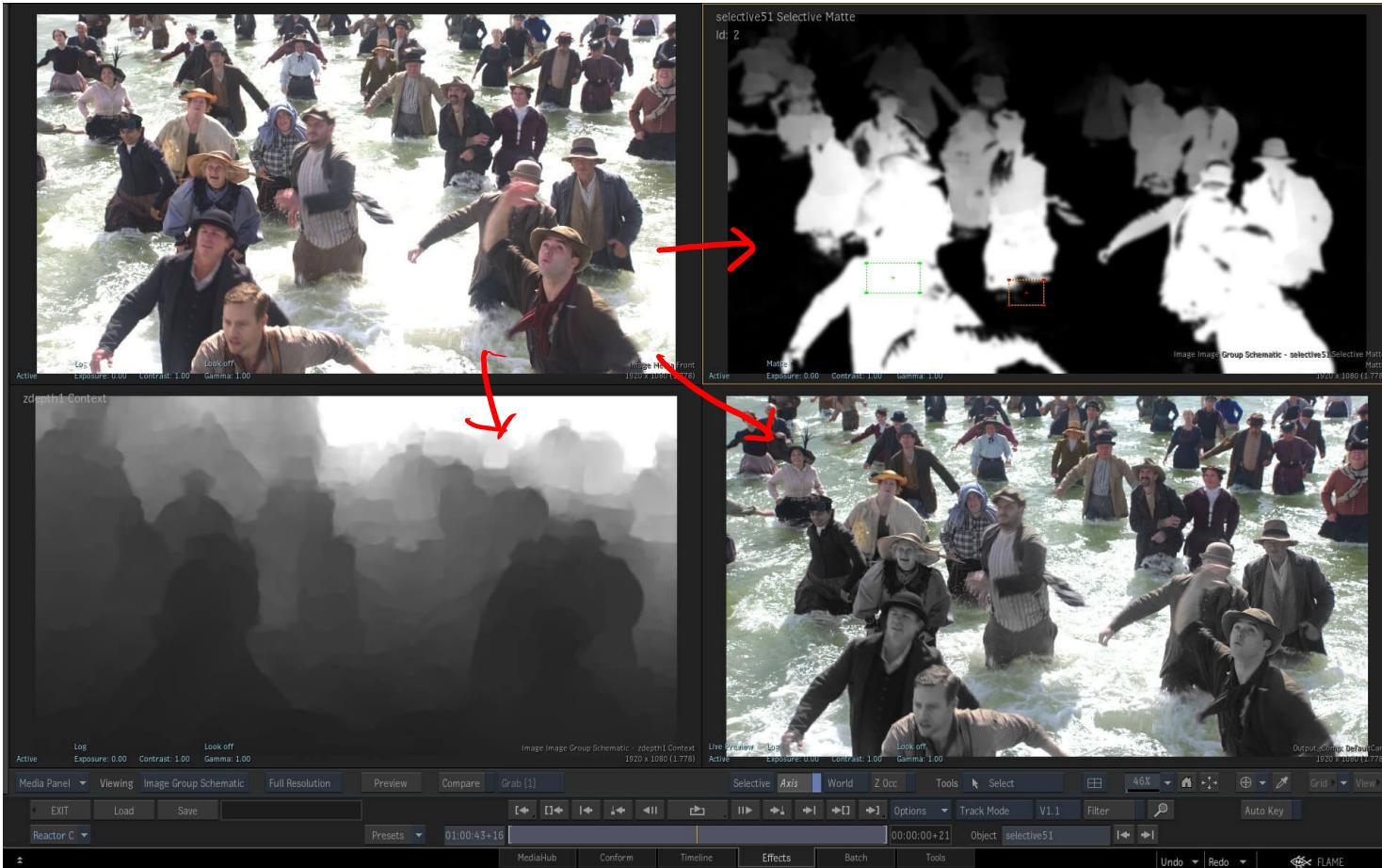


③

Human - Computer Interaction



④. Augmented Reality



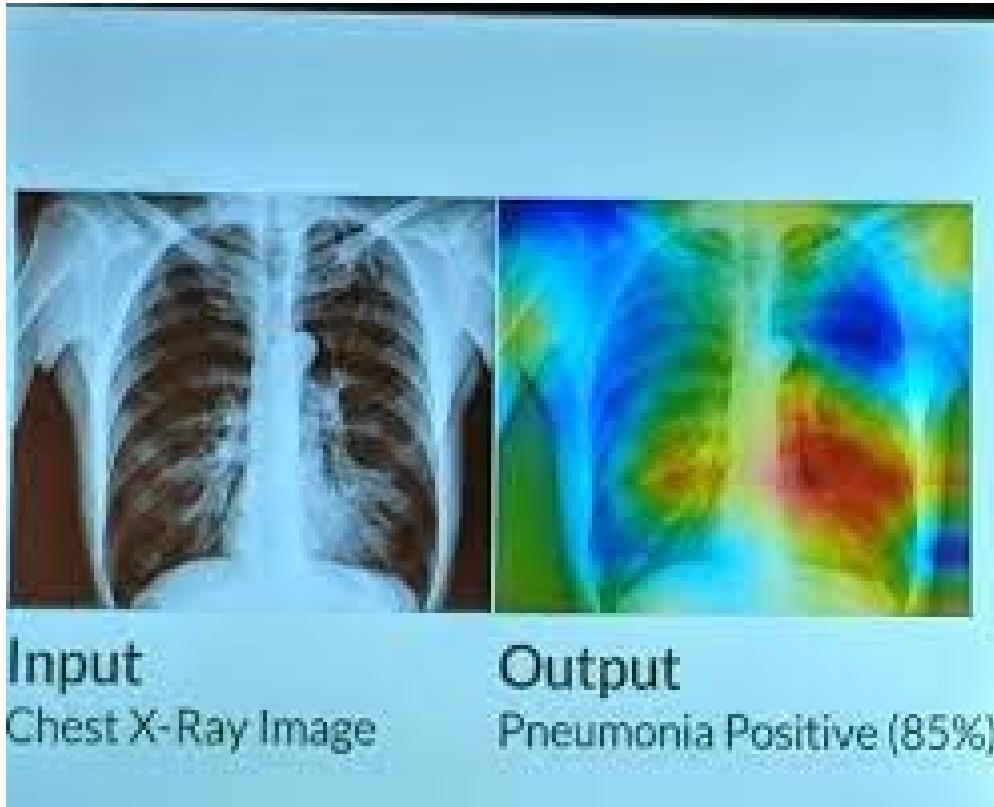


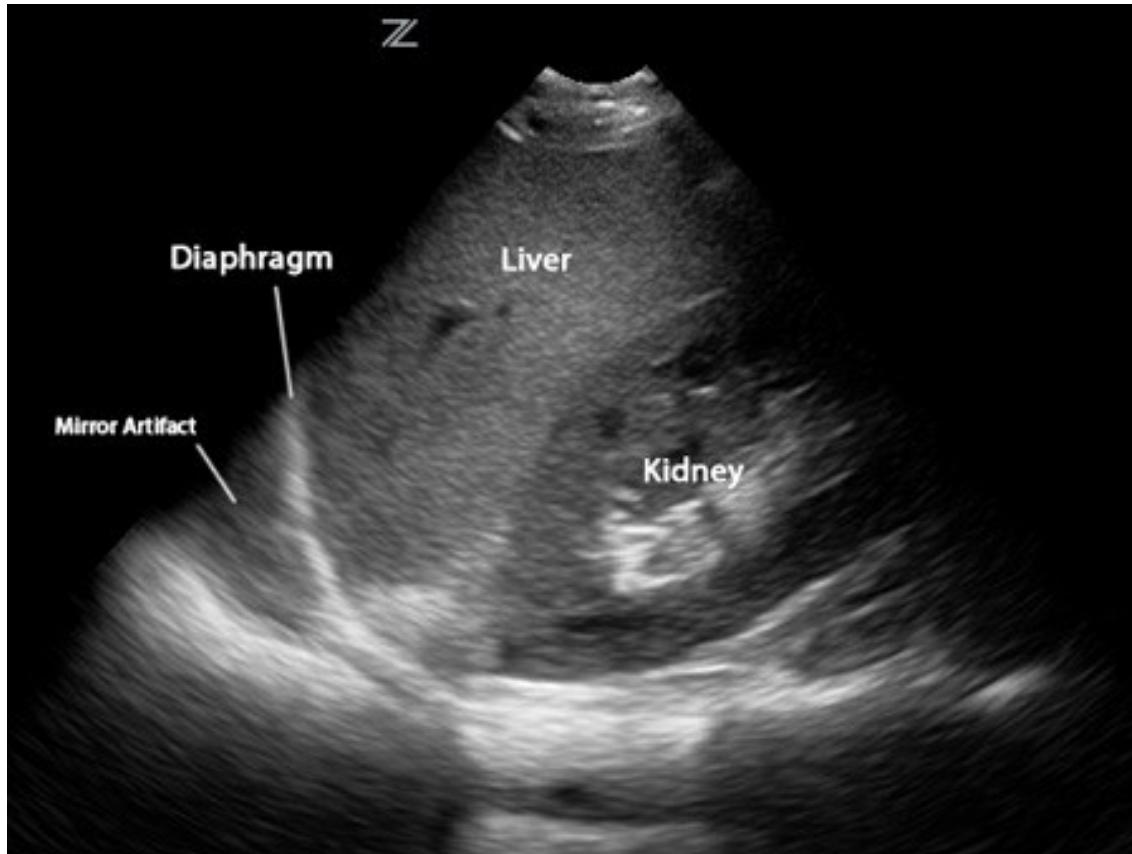
⑤. Factory Automation



⑥

Medical Imaging





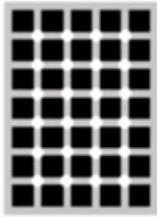
Why is Computer Vision hard?

①



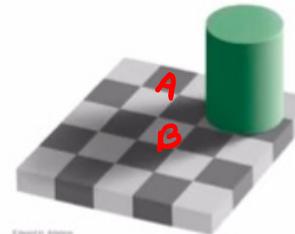
Müller-Lyer illusion: Which line is longer?

③



Variation of Hermann grid illusion: What do you see at the intersections?

②



Edward H. Adelson

Adelson's brightness constancy illusion:
Which is brighter, A or B?

④

x x x x x x x x	o x o x o x x
x x x x x x x x	x o x x x o x
x x x x x x x x	o x x o x x o
x x x x x x x x	x x o x o o x
x x x x x x x x	o x x o x x x
x x x x x x x x	x o x x x o x
x x x x x x x x	o x x o x x o
x x x x x x x x	x o x x x o x
x x x x x x x x	x x x o o x x
x x x x x x x x	x o x x x o x

Count the red Xs in both figures, which is harder? ☺

other applications of Computer vision

- 1) Agriculture
- 2) Banking and Finance Sector (Mobile deposit,
Insurance Risk Profiling)
- 3) Remote Sensing (Land use understanding,
forestry modeling)
- 4) structural health monitoring
(oil well inspection, Drone-based
bridge inspection and 3D reconstruction.)

- 5) Document Understanding
(optical character recognition, Robotic process automation)
- 6) Tele-and Social media
(Image Understanding, Brand exposure analytics)
- 7) Augmented Reality
(Warehouse and enterprise management)
- 8) Retail and Retail Security (Ex Amazon go)
- 9) Healthcare (Blood Loss detector)

Why is it hard?

many practical use cases are inverse
model application

- No knowledge of how an image was taken or camera parameters.
- But need to model the real world in which picture/video was taken (Shape, lighting, color, objects, interactions)
- Need to always model from incomplete/partial noisy information

- Forward models are used in physics (radiometry, optics, and sensor design) and in computer graphics.
- High dimensional data requires heavy computation.
- No complete models of the human visual system exist.

- verification of mathematical/physical models
- hard to identify manipulation