

AiCE Warp

Computer Vision and its Applications

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Overview

For this session, we'll guide you through the following materials.

-  **Instructors** - get to know your coach and TAs
-  **What is Computer Vision?** - a little bit about CV and its application
-  **Applications** - applications of computer vision
-  **Tools & Tasks** - toolings & how to get started

Acknowledgement

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Instructors



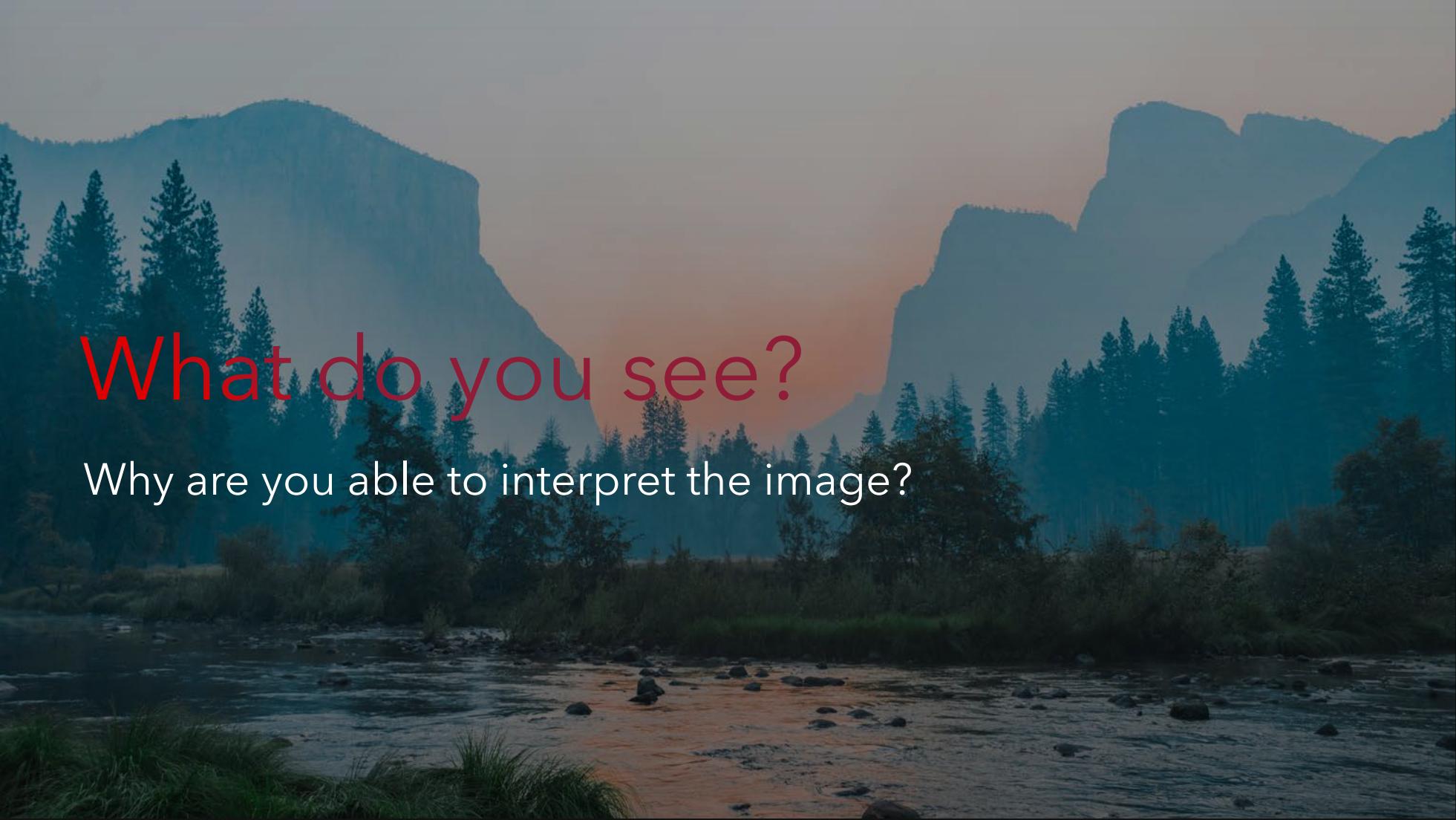
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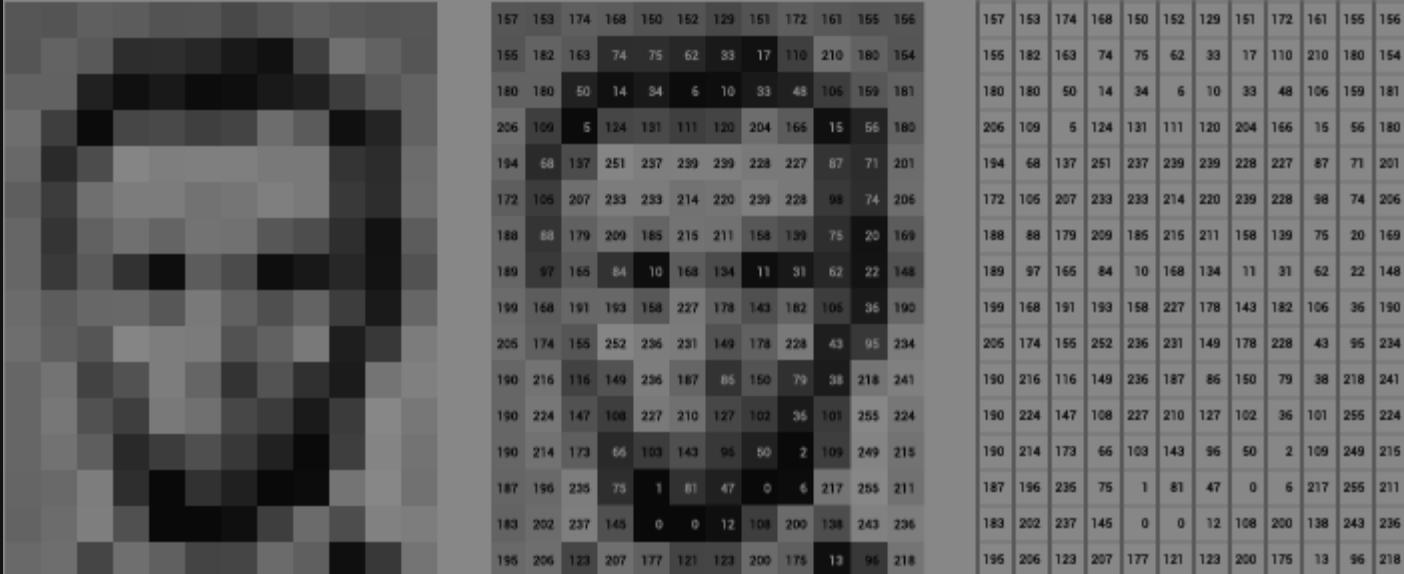
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Teaching Assistant (Tech Support)
`@seksu`

A scenic landscape at sunset or sunrise. In the foreground, a river flows through a valley, its water reflecting the warm colors of the sky. The banks are lined with tall evergreen trees and some deciduous foliage. In the background, large, rugged mountains rise against a sky transitioning from deep blue to a bright orange and yellow glow near the horizon.

What do you see?

Why are you able to interpret the image?

What does a computer see?



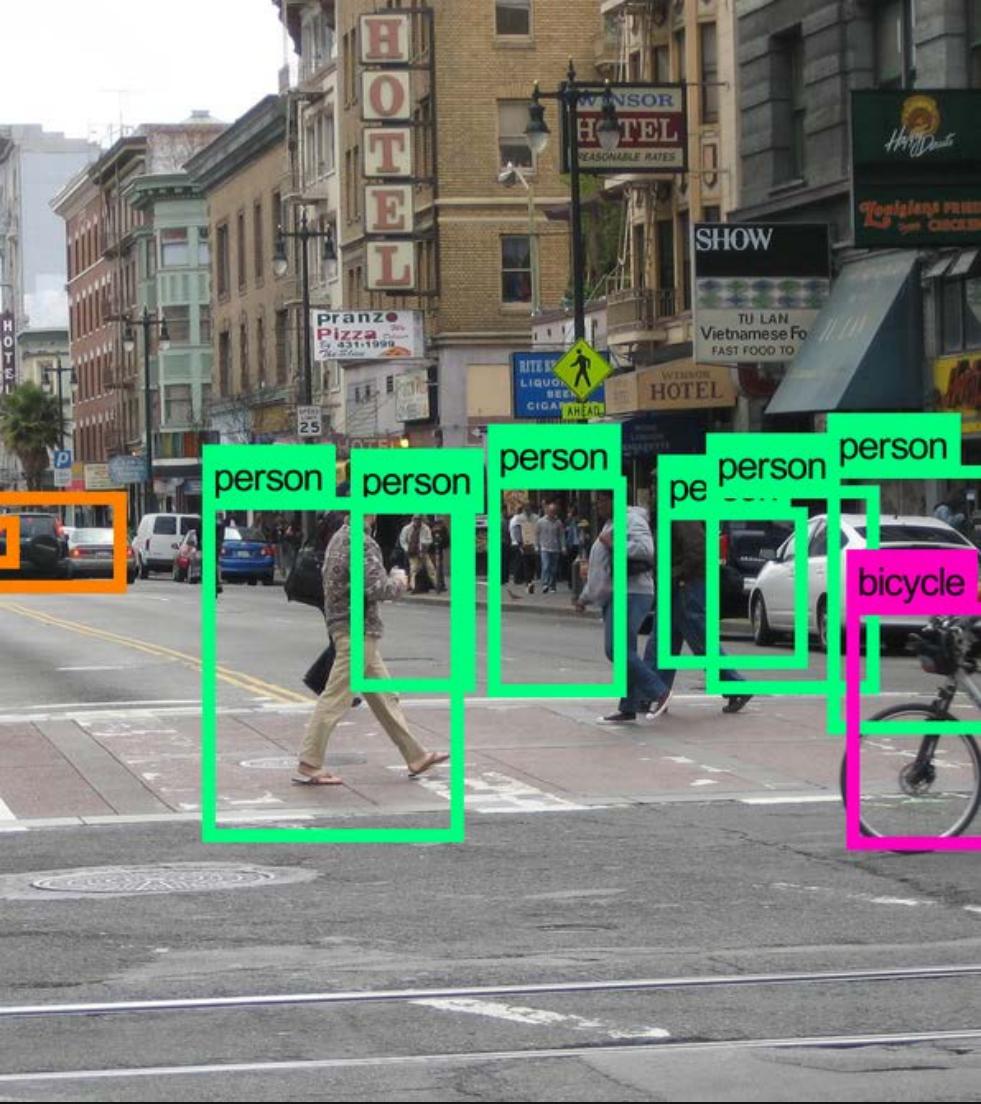
Left: Digital image; **Center:** Pixels labeled with a number from 0-255; **Right:** Image representation [1]

1. Image credit: openframeworks 

What is Computer Vision?

Computer vision is a field in computing that focuses on creating a digital system that can process, analyze, and make sense of visual data.

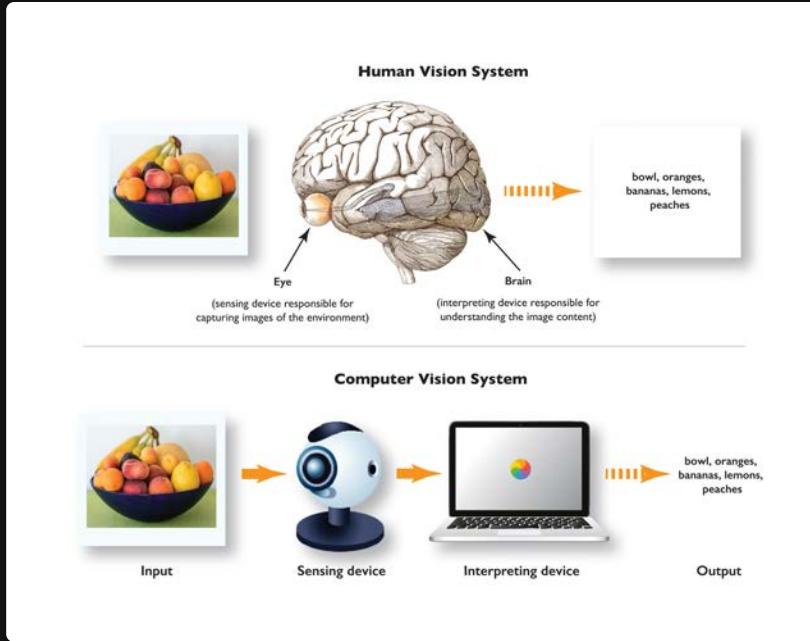
- Given input images/videos (representation)
- Processing (math alert!)
- Output (interpretation or decision)



Goal of Computer Vision

To give computer (super) human-level perception

Perception Pipeline



Human Vision & Computer Vision System [1]

1. Image credit: Manning

Autonomous Retail



Industrial Inspection



CMKL-ThaiBev Bottle Recycling

ตรวจสอบความสมบูรณ์
ของปากขวด



คัดลอกลิงก์

ดูบน YouTube

Face Detection



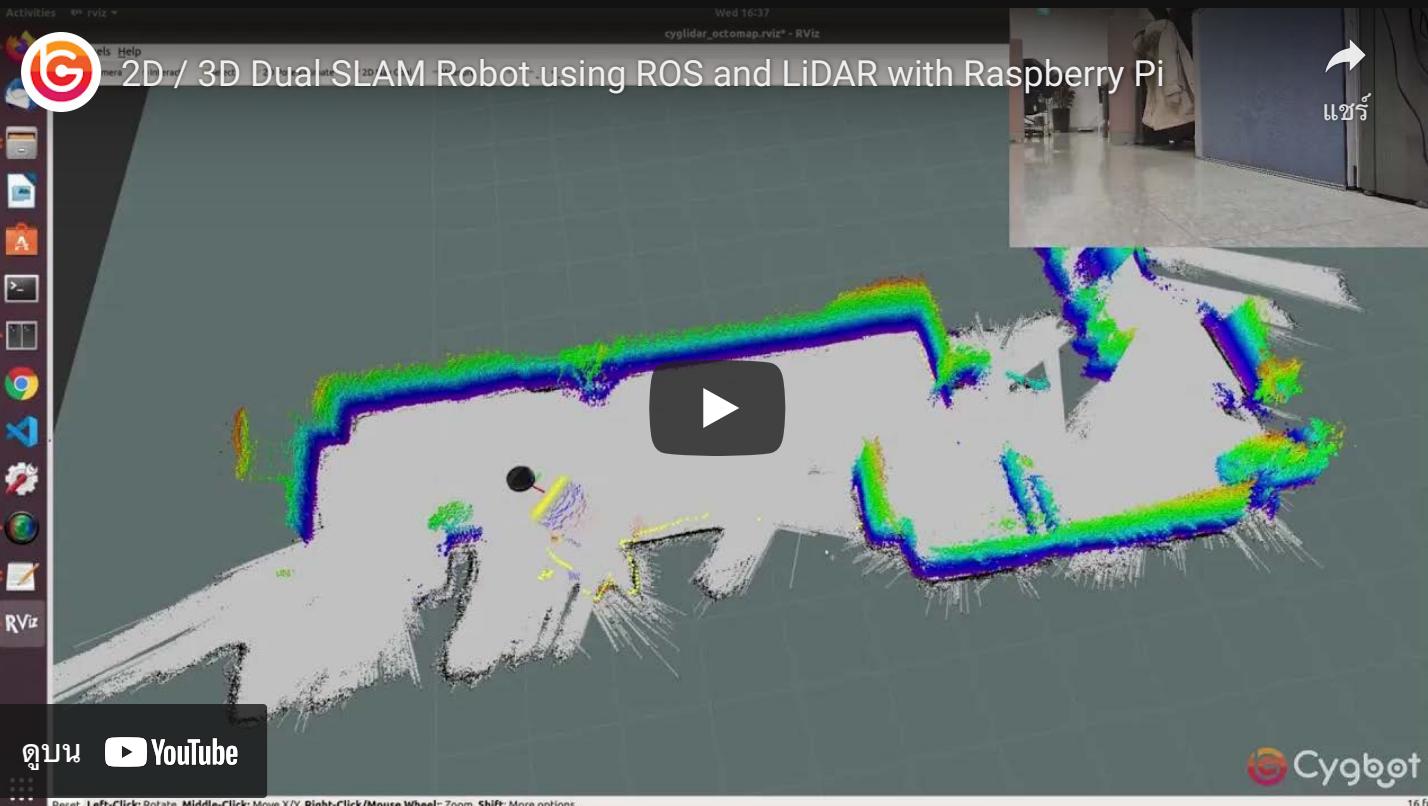
Detect Plant Diseases



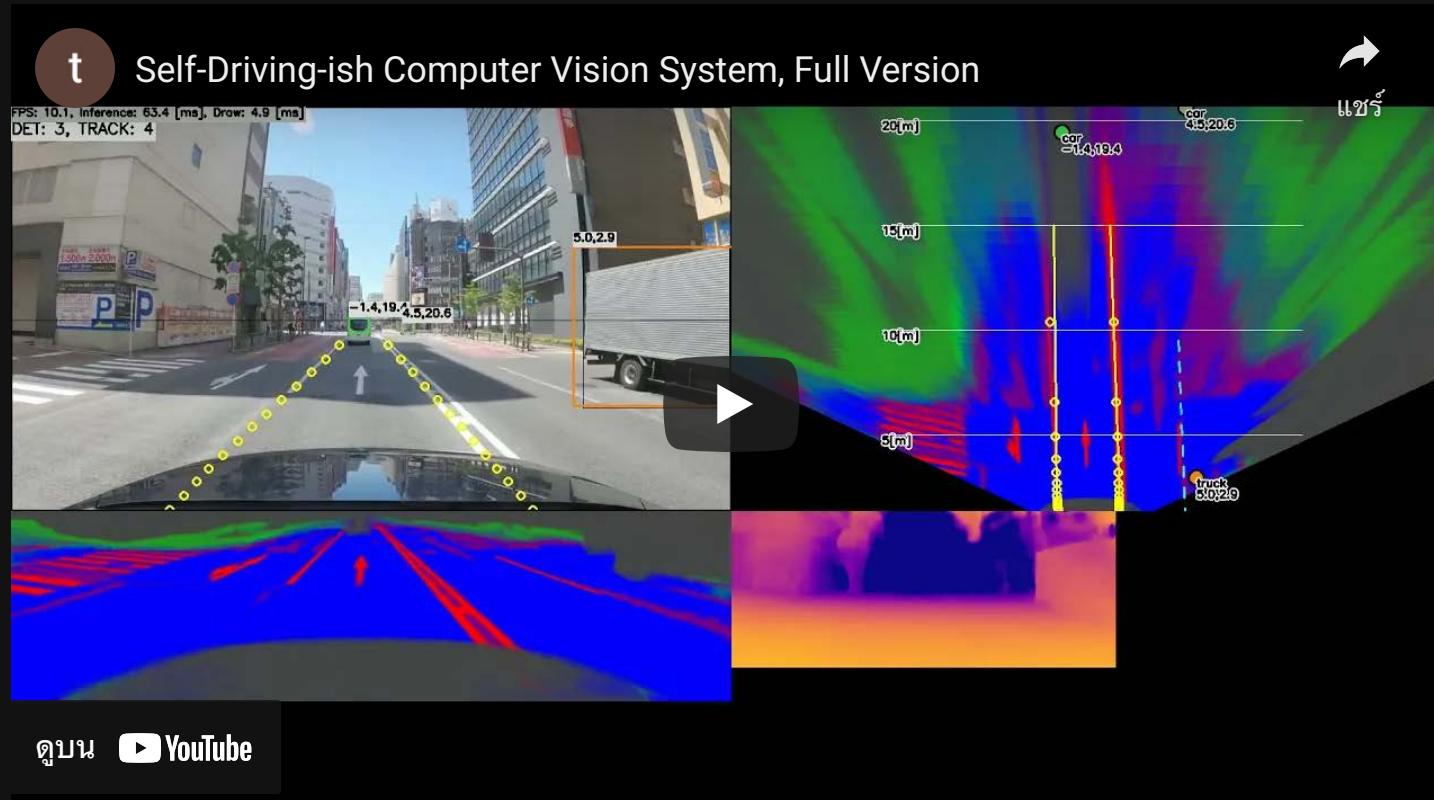
Image Segmentation



Simultaneous Localization and Mapping



Self-driving Car



Tools & Tasks

Ok, that's quite a lot. Where do I get started?

-  **Python** - Another programming language? [Learn](#)
-  **IDE** - Try Visual Studio Code or [DataSpell](#)
-  **NumPy** - Get familiar with arrays & matrix manipulations; see [NumPy Tutorial](#)

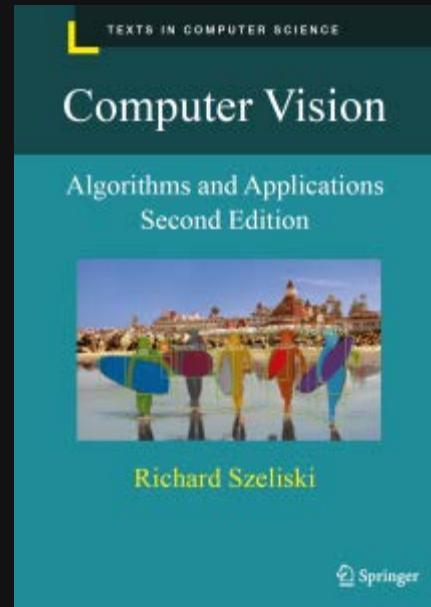
If you've already got the basics:

-  **Tutorial** - Head over to our [tutorial contents](#) (we'll cover them in labs)
-  **Seeing AI** - Get together in groups & think about building your project over the next 5 weeks

Recommended Reading

Richard Szeliski, Computer Vision: Algorithms and Applications, 2nd ed.

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



Self-study Contents

Tutorials · GitHub
