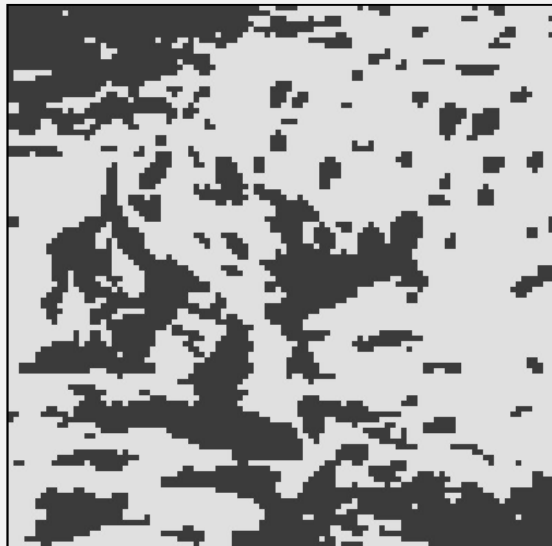


Department of Computer Science
University of Bristol

COMSM0020 & COMS30121

Image Processing and Computer Vision

www.ole.bris.ac.uk/bbcswebdav/courses/COMS30121_2019_TB-1/index.html



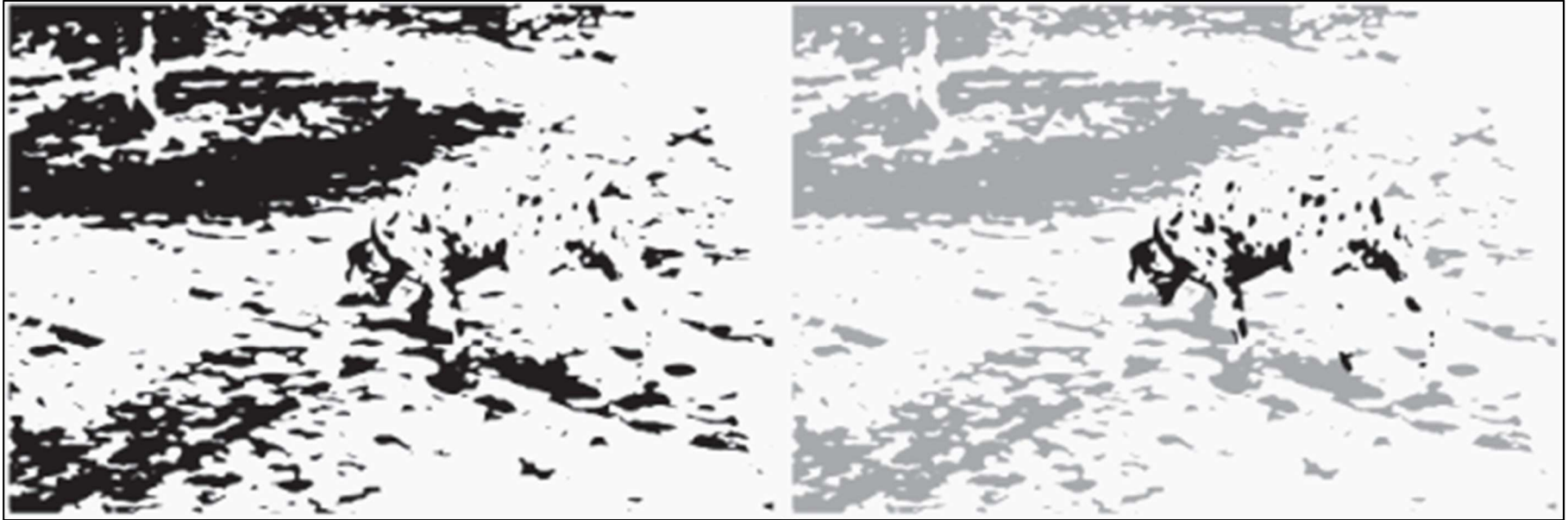
Lecture 01

Introduction

Andrew Calway
Majid Mirmehdi
Tilo Burghardt

11 Slides

What is Computer Vision?



Computer Vision ... attempts bridging the semantic gap between picture elements [pixels] and their meaning

What is Computer Vision?

Pixels

Features

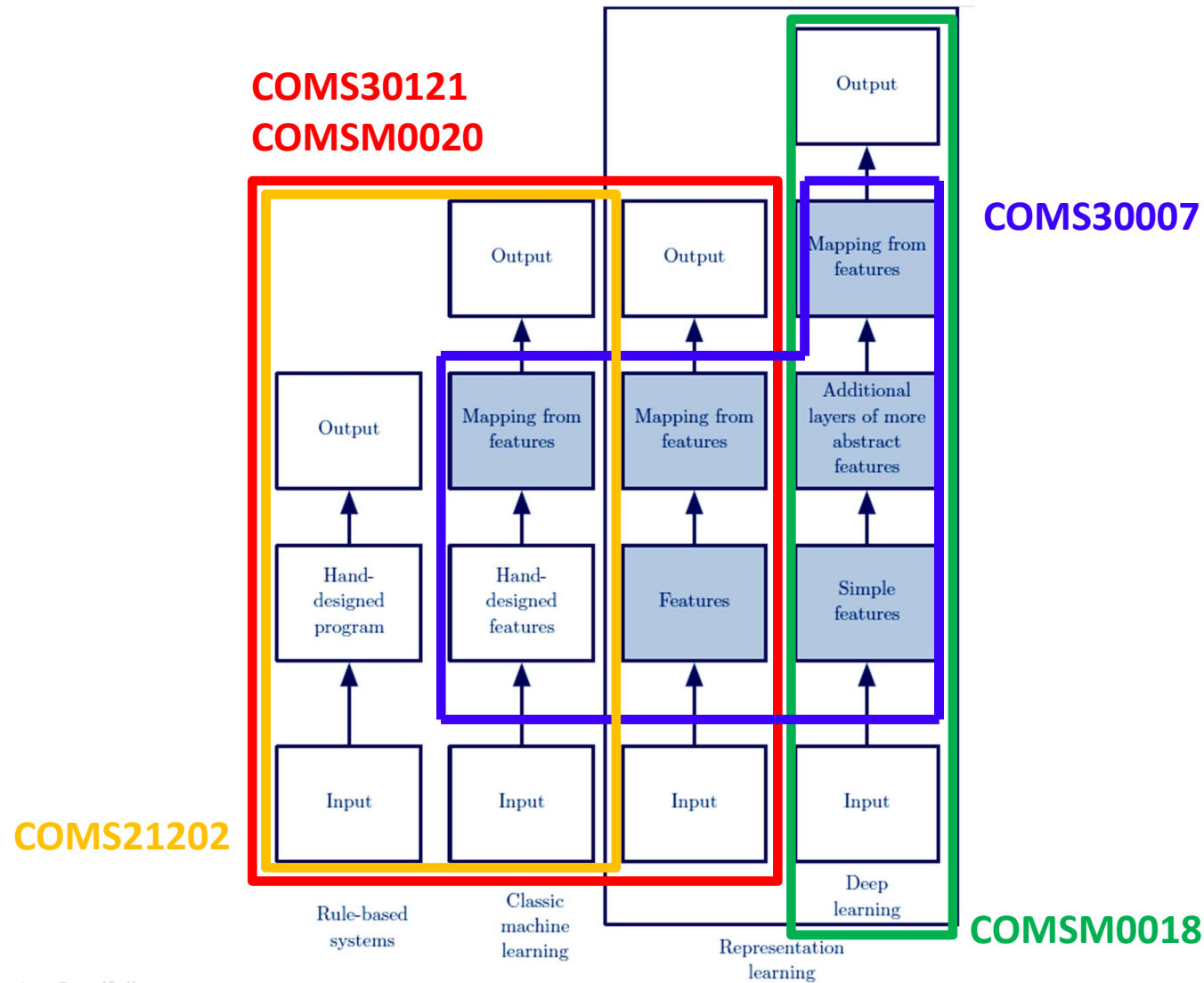
Models

Meaning

Computer Vision ...

... concerns the study of the theory, engineering and application of artificial systems that extract semantic information from images, videos or other structured, multi-dimensional data.

The Unit in its Machine Learning Context

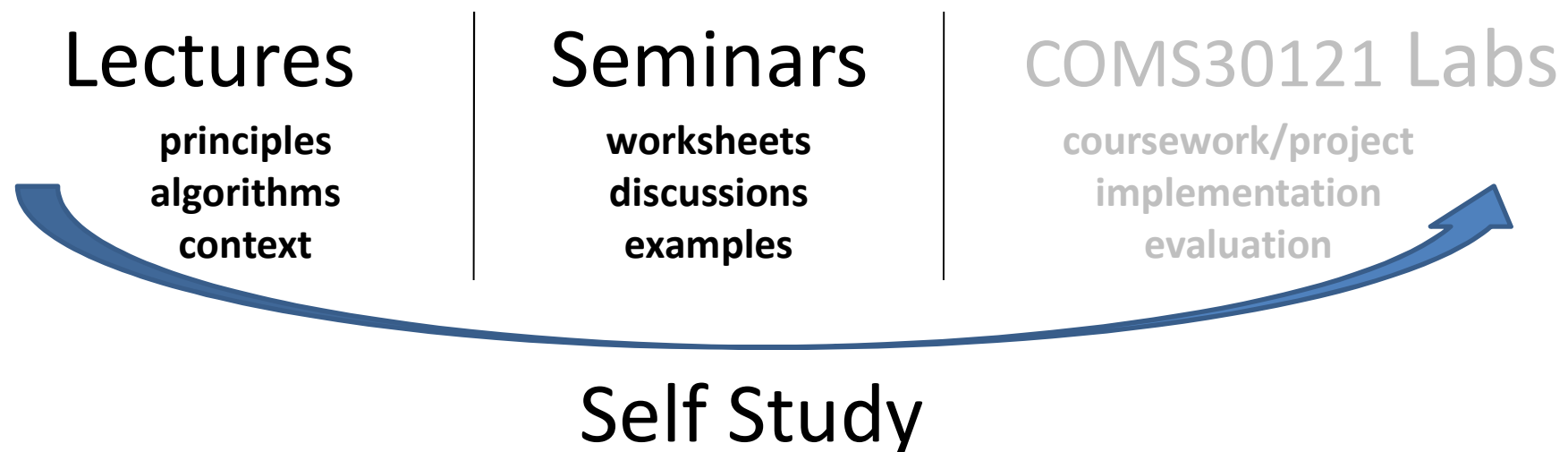


Source modified from: Ian Goodfellow,
www.deeplearningbook.org

What will we teach in the subject?

A first introduction to classical computational vision: the theory, principles, techniques, algorithms and applications.

The unit is structured in terms of topics. For each topic, we cover the basics of the underlying theory, some practical challenges, important algorithms, and example applications.



Lectures+Seminars

The unit aims at providing a first theoretical introduction to classical computational vision: the theory, principles, techniques, and algorithms.

Lectures will introduce a topic and identify the key theory, challenges and applications. Students are expected to follow this up with self study based on a problem sheet, revision and further reading.

The problem sheet will be worked on in the seminars where students will discuss solutions with their peers directed by a member of the teaching team.

ASSESSMENT: 100% Final Exam

Lectures+Seminars+Labs

The unit aims at providing a first theoretical and practical introduction to classical computational vision: the theory, principles, techniques, algorithms and implementations.

In addition to lectures and seminars there are labs. Implementations will be done using OpenCV, which is open-source and available freely for most platforms and languages. We suggest you install it on your own machines.

You can choose to work on your platform in a language you are most fluent in (at your own risk!); we will only support the MVB2.11 lab setup and the C++ interface of OpenCV.

You will work in pairs during the lab sessions and courseworks. **TASK: Form pairs and register online at the end of this lecture.**

ASSESSMENT: 50% Coursework, 50% Final Exam

The Unit Website

COMSM0020/COMS30121: Image Processing and Computer Vision

[COMSM0020 Unit Details](#) | [COMSM0020 FORUM](#) | [COMS30121 Unit Details](#) | [COMS30121 FORUM](#) | [STAFF](#) | [ACKNOWLEDGEMENTS](#)

	MONDAY LECTURES (ALL)	TUESDAY SEMINARS (ALL)	LABS (COMS30121 ONLY)
WK 1	<p>30/09/19 2pm ChemLT1</p> <p>Lecture 01: INTRODUCTION (print, resources, recording)</p>		<p>03/10/19 4-6pm MVB2.11</p> <p>Formative Lab: OPEN-CV WARM-UP (0%) (pair work), (resources)</p> <p>TEAM SIGNUP: Signup as a COMS30121 team with your TWO comma-separated usernames in the participant field. Deadline is end of Wed 02/10/19, 23:59.</p>
WK 2	<p>07/10/19 2pm ChemLT1</p> <p>Lecture 02 (Majid): ACQUISITION & REPRESENTATION</p>	<p>08/10/19 1pm(G1) + 2pm(G2) MVB1.11</p> <p>Seminar: PINHOLE CAMERA & ALIASING</p>	<p>10/10/19 4-6pm MVB2.11</p> <p>Formative Lab: THE MANDRILL CHALLENGE (0%)</p>
WK 3	<p>14/10/19 2pm ChemLT1</p> <p>Lecture 03 (Majid): FREQUENCY DOMAIN & TRANSFORMS</p>	<p>15/10/19 1pm(G1) + 2pm(G2) MVB1.11</p> <p>Seminar: FREQUENCY DOMAIN</p>	<p>17/10/19 4-6pm MVB2.11</p> <p>Formative Lab: THE NUMBER PLATE CHALLENGE (0%)</p>

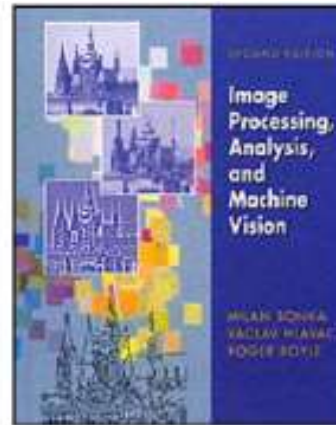
Access via Blackboard or via
www.ole.bris.ac.uk/bbcswebdav/courses/COMS30121_2019_TB-1/index.html

Unit Topics in a Nutshell

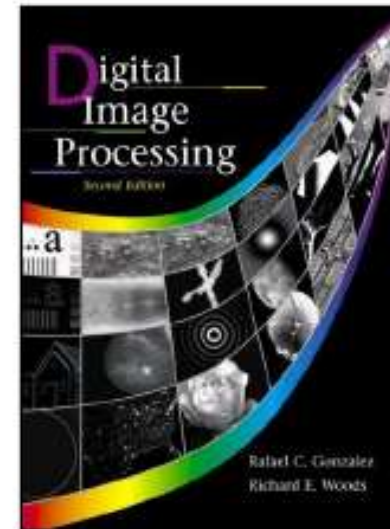
- Acquisition and Representation
- Frequency Domain & Image Transforms
- Edges and Shape
- Segmentation
- Classical Object Detection
- Motion Analysis
- Stereo Vision

Some Suggestions for General Reading

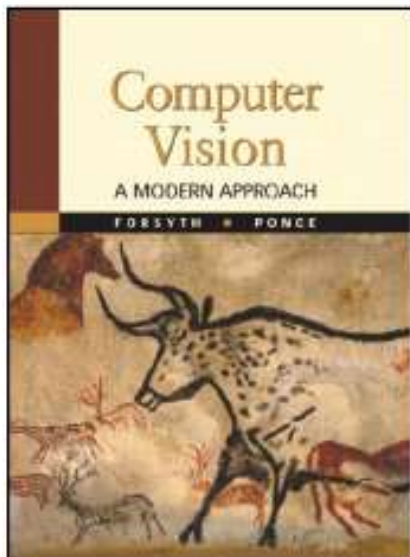
Image Processing
Analysis and
Machine Vision
by Sonka, Boyle and Hlavac



Digital
Image
Processing
by Gonzalez and Woods



Computer Vision:
A Modern Approach
by Forsyth and Ponce



Demo Applications



Don't leave the room without having registered a team!

'COMS30121 Team Formation'

Signup as a PAIR for with TWO comma-separated usernames in the participant field. Then turn up to the lab slot you signed up for.

Use the link on the website:

www.ole.bris.ac.uk/bbcswebdav/courses/COMS30121_2019_TB-1/index.html

...or directly via this doodle link:

<https://doodle.com/poll/28s7i3anek3nf8g7>

TASK: You have to signup ASAP – labs start on Thursday!