

## Welcome to Computer Vision 102

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## The Empty Boxes

Most slides have an empty box

Neuroscience shows a connection between motion and memory systems

Educational experience shows activity improves retention

Most slides have a box to fill in with an important concept word: to emphasise the concept, stimulate the memory & keep you awake.

PS: Educational evidence shows retention drops to c. 10% after 30 min. So take a break!

## Computer Vision

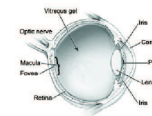
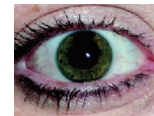
Assume: images, image capture, simple image processing - hence 102

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Research Interests:  
3D computer vision/video analysis

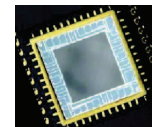
And lots of help from: T. Breckon, L. Horna, S. Rodnes, E. Vafeias

## Problem of Vision - complexity



Human Vision:

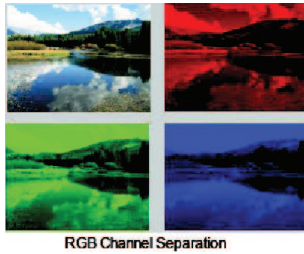
- Built-in 3D stereo & video
- Excellent visual reasoning
- Not well understood



Computer Vision:

- Hard to get quality 3D
- Noise (environment, sensor)
- Limited, static viewpoints
- Low relative resolution
- Well understood, limited algorithms

## Types of Visual Sensing



1. RGB:



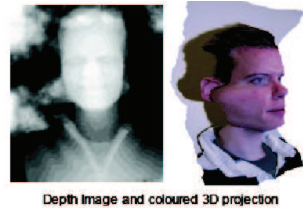
2. Greyscale:

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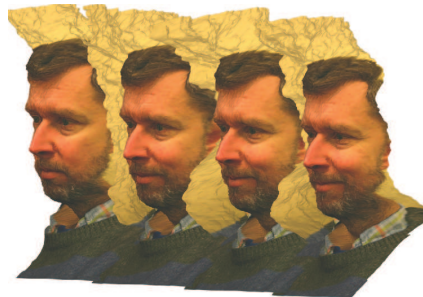
Introduction & Overview

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6. 3D capture (static)



7. 3D capture (video)

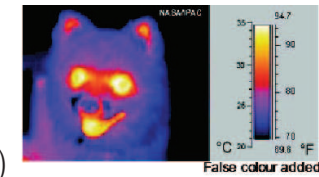


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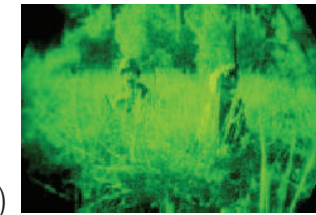
3. Video:



4. Infrared (heat)



5. Infrared (night vision)



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Introduction & Overview

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## Seven Example Image Analysis Systems

1. Orthographically viewed rigid 2D objects
2. Orthographically viewed non-rigid 2D objects
3. Video change detection & tracking
4. Video: human behaviour analysis
5. Recognising 3D objects from range data
6. Recognising 3D objects from stereo data
7. DeepNets for Vision Introduction

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