IPE
BUSINESS SCHOOL

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Gli scenari futuri dell'innovazione tecnologica e dell'intelligenza artificiale:
applicazioni, rischi, opportunità

Martedì 30 Gennaio 2024 ore 17.00
Aula Magna Fondazione IPE Business School Napoli
via Pontano 36 Napoli

RELAZIONI

- COMPUTER VISION: ABILITARE I COMPUTER A VEDERE E INTERAGIRE
ROBERTO CIPOLLA, *Prof. Ingegneria Informatica, Università di Cambridge*

- CES 2024 (LAS VEGAS): GLI SCENARI FUTURI DELL'INNOVAZIONE TECNOLOGICA
FABIO DE FELICE, *Prof. Dipartimento Ingegneria, Università Parthenope, Presidente Protom Spa*

MODERA

GIORGIO VENTRE,
Prof. Sistemi per l'Elaborazione delle Informazioni Università Federico II, Direttore scientifico Apple Developer Academy

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Computer Vision:

Geometry, uncertainty and deep learning

Roberto Cipolla
Department of Engineering

http://www.eng.cam.ac.uk/~cipolla/people.html
http://www.toshiba.eu/eu/Cambridge-Research-Laboratory/

From Representation to Action

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"Intelligence can be viewed as a process
that converts unstructured information into useful and actionable knowledge" - Hassabis (DeepMind)

Real-time application - SegNet

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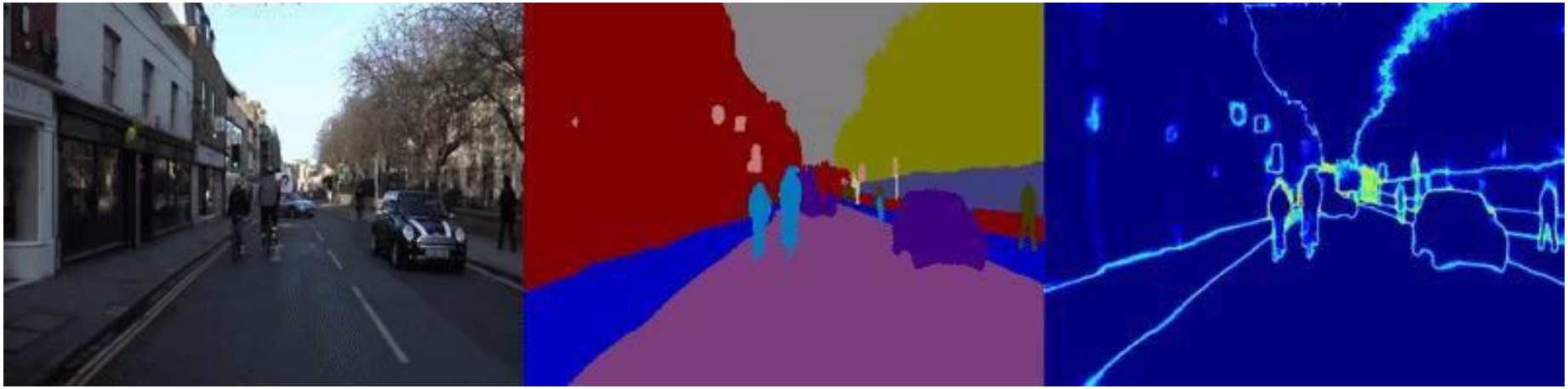

Input Image Semantic Segmentation Uncertainty

Badrinarayanan, Kendall and Cipolla 2015 and 2017
SegNet: Encoder-decoder architectures for scene segmentation

Multi-Task Learning

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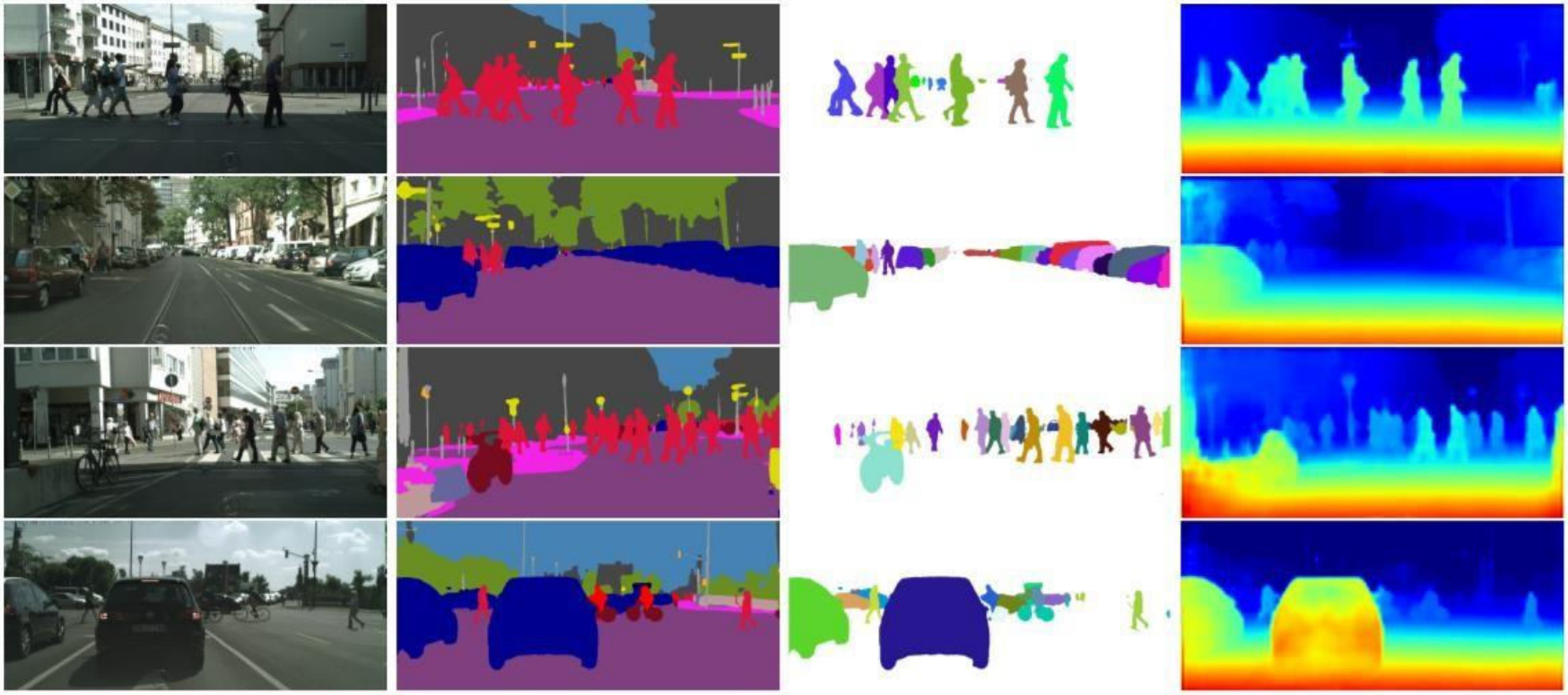

(a) Input image (b) Segmentation output (c) Instance output (d) Depth output

Kendall, Gal and Cipolla 2018 Multi-task Deep Learning

Why? Applications

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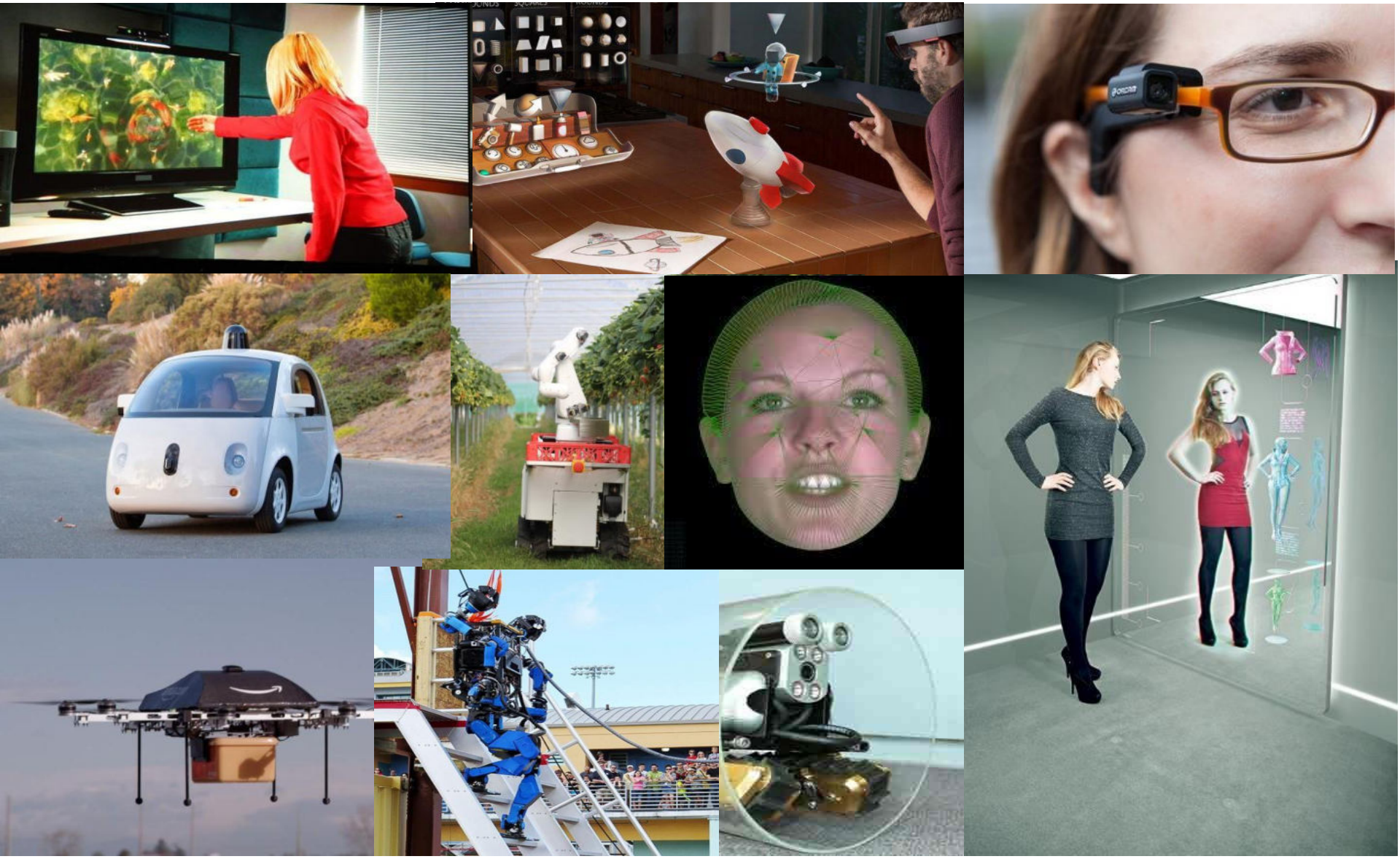

Overview

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1. Introduction

2. 3R's of Computer Vision:
   - Reconstruction
   - Registration
   - Recognition

3. Geometry and uncertainty in deep learning

Computer Vision: 3R's

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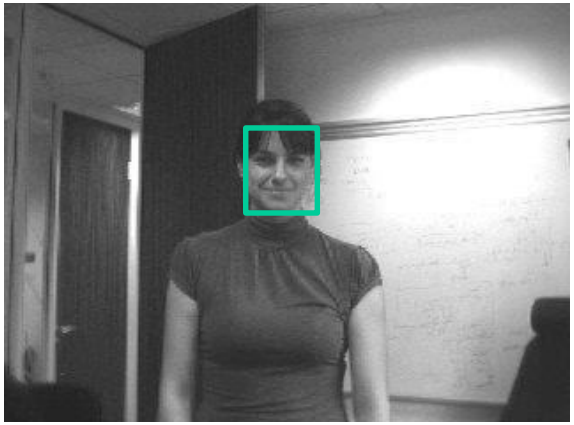
Reconstruction **Registration** **Recognition**



Reconstruction: Recover 3D shape

Registration: Compute their position and pose

Recognition: Identify objects

Geometry - Transformations

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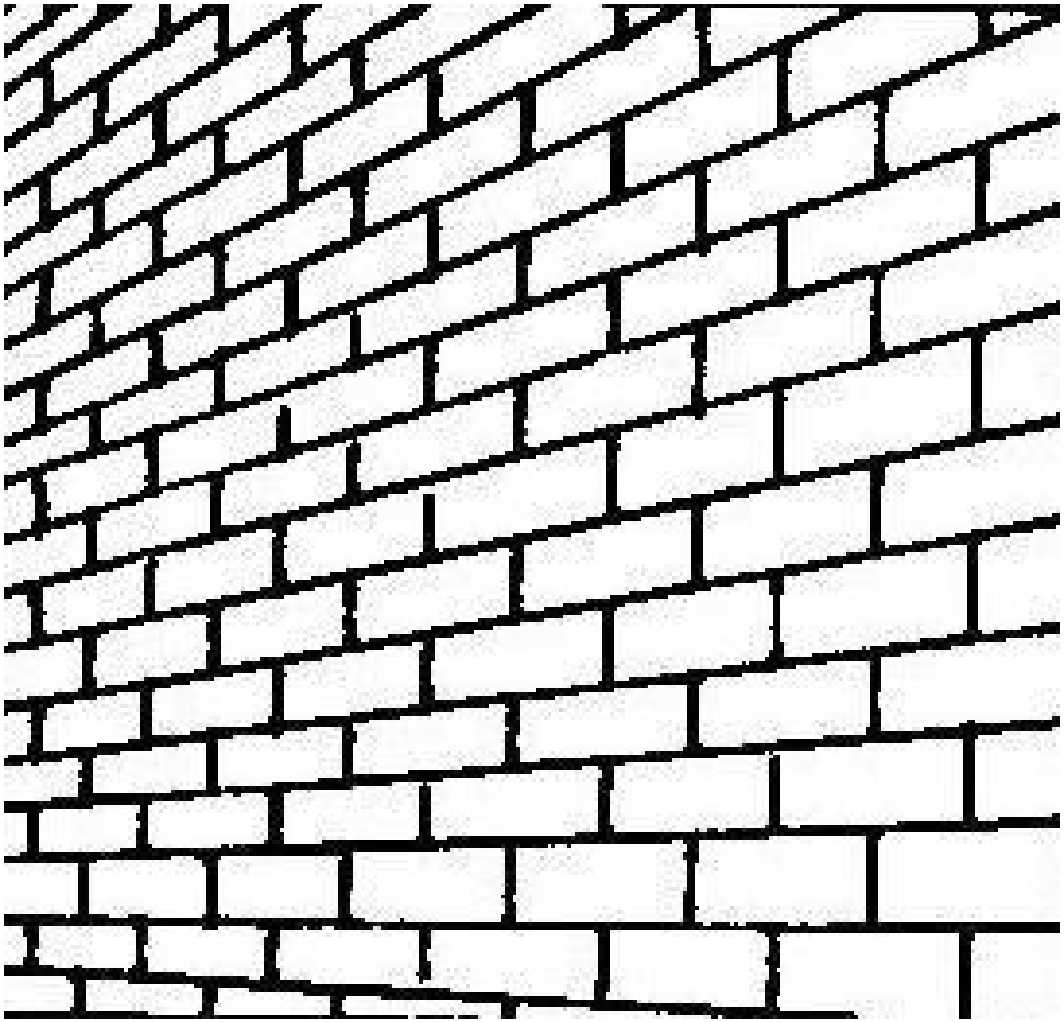

Time to contact

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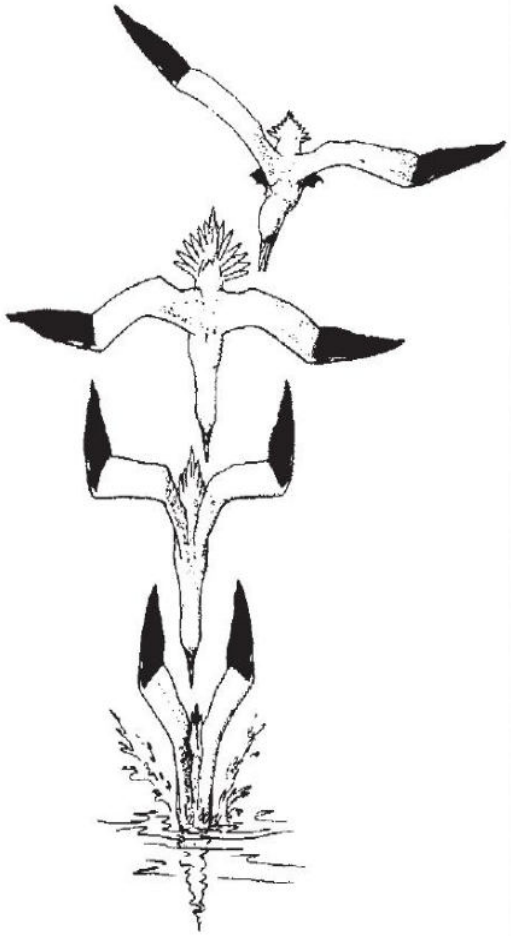

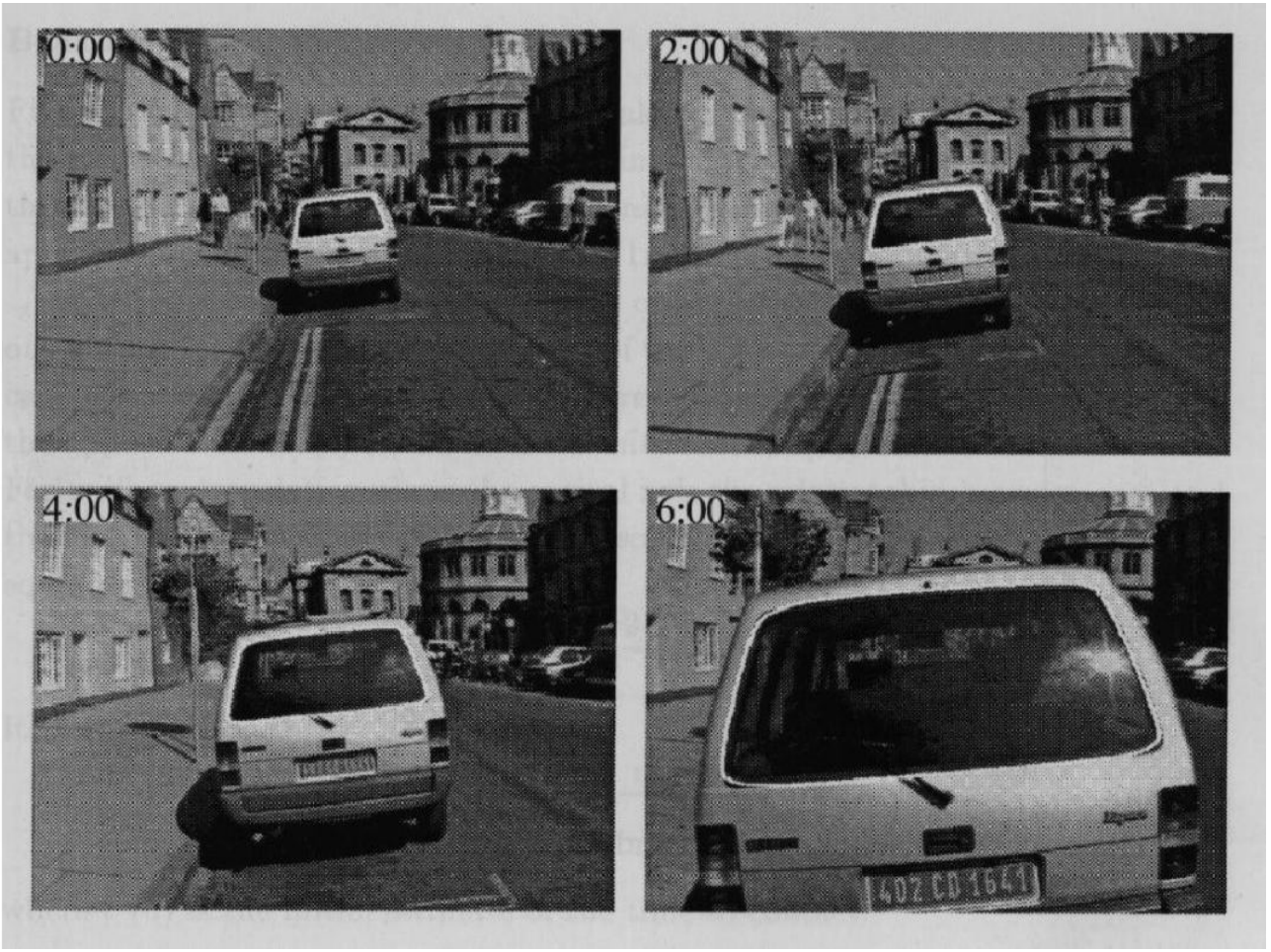

Lee and Reddish 1981

Cipolla and Blake 1992

Time to contact