UNIVERSITÀ DI PAVIA

Anno Accademico 2019/2020

COMPUTER VISION	
Anno immatricolazione	2019/2020
Anno offerta	2019/2020
Normativa	DM270
SSD	ING-INF/05 (SISTEMI DI ELABORAZIONE DELLE INFORMAZIONI)
Dipartimento	DIPARTIMENTO DI INGEGNERIA INDUSTRIALE E DELL'INFORMAZIONE
Corso di studio	COMPUTER ENGINEERING
Curriculum	Embedded and Control Systems
Anno di corso	1°
Periodo didattico	Primo Semestre (30/09/2019 - 20/01/2020)
Crediti	6
Ore	60 ore di attività frontale
Lingua insegnamento	English
Tipo esame	SCRITTO E ORALE CONGIUNTI
Docente	ALDEA EMANUEL (titolare) - 1 CFU CANTONI VIRGINIO - 5 CFU
Prerequisiti	This course is intended for advanced undergraduate students. We assume students have a rudimentary understanding of linear algebra, calculus, and are able to program in some type of structured language.
Obiettivi formativi	Computer Vision consists of inferring properties of the world based on one or more digital images. Provides background in image processing and image formation. Focus on algorithms for image and video analysis based on color, texture, shading, stereo, and motion.
Programma e contenuti	Introduction to Computer Vision Basic definitions. Low-level image analysis methods, including image formation, edge detection, feature detection, and image segmentation. 3D Vision and motion analysis

Methods for reconstructing three-dimensional scene information using techniques such as depth from stereo, structure from motion, and shape from shading. Motion and video analysis.

Object recognition
Recognition Processes. Direct Comparison. Alignment methods. Invariant properties methods. Parts decompositions method. Hough transform.

Image synthesis
Computer graphics topics involving computational photography and image-based rendering. Local rendering, Phong model. Advanced rendering techniques, topics include ray casting, ray tracing, and radiosity.

Metodi didattici	Lectures (hours/year in lecture theatre): 45 Practical class (hours/year in lecture theatre): 0 Practicals / Workshops (hours/year in lecture theatre): 0
Testi di riferimento	V. Cantoni, S. Levialdi, B. Zavidovique. 3C Vision - Cues, Context and Channels. Elsevier, 2011. V. Cantoni. Course slides.
Modalità verifica apprendimento	Students will be asked to read three papers. They will be required to write a report of one of these papers, due before we discuss the paper. Each student is required to complete a laboratory project consisting of a sequence of image analysis steps resulting in image interpretation thus emphasizing hands-on image analysis experience. The exam consists on the discussion of the projects and on the paper report.
Altre informazioni	Students will be asked to read three papers. They will be required to write a report of one of these papers, due before we discuss the paper. Each student is required to complete a laboratory project consisting of a sequence of image analysis steps resulting in image interpretation thus emphasizing hands-on image analysis experience. The exam consists on the discussion of the projects and on the paper report.
Obiettivi Agenda 2030 per lo sviluppo sostenibile	$lbl_legenda_sviluppo_sostenibile