

## 433-483 Computer Vision and Image Processing

<b>Credit Points:</b>	12.50
<b>Level:</b>	4 (Undergraduate)
<b>Dates &amp; Locations:</b>	This subject is not offered in 2009.
<b>Time Commitment:</b>	Contact Hours: Twenty-four hours of lectures, 11 hours of workshops Total Time Commitment: Not available
<b>Prerequisites:</b>	Study at the third-year level in at least four of the following areas: artificial intelligence, computer design, database systems, graphics, interactive system design, networks and communications, operating systems, programming languages, software engineering, and theory of computation. Prior study in the areas of artificial intelligence and computer graphics would be an advantage.
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	<p>&lt;p&gt;For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry.&lt;/p&gt;         &lt;p&gt;It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: &lt;a href="http://services.unimelb.edu.au/disability"&gt;http://services.unimelb.edu.au/disability&lt;/a&gt;&lt;/p&gt;</p>
<b>Subject Overview:</b>	<p>This subject gives an introduction to computer vision and image processing. Computer vision is the business of using computers to extract useful information automatically from digital images and videos; image processing is the business of transforming images to be more suitable for human interpretation, storage, transmission, or subsequent analysis by computer vision. Computer vision and image processing can be used in such practical applications as: automated inspection for quality control in industry; medical imaging; visual guidance for robots; face recognition; automated surveillance and monitoring; remote sensing to a degree providing a visual sense for machines.</p> <p>Topics covered include low-level, mid-level, and high-level vision; image formation; synopsis of human vision; segmentation and feature extraction; perceptual organisation; visual motion analysis; stereo; shape from shading and other properties; colour processing; shape analysis; texture; Hough transform; image compression; object recognition; and image interpretation and scene understanding.</p>
<b>Objectives:</b>	<p>On successful completion, students should:</p> <ul style="list-style-type: none"> <li># know about the processes of image formation and digitization, at an elementary level, sufficiently to understand the basis of techniques for image processing and computer vision</li> <li># know the common techniques used in computer vision and image processing, and be able to fit them into a conceptual framework of low-level, mid-level and high-level processing</li> <li># be able to evaluate, select and adapt these techniques appropriately to solve problems in image processing and computer vision;</li> <li># be able to undertake problem identification, formulation and solution;</li> <li># have a capacity for independent critical thought, rational inquiry and self-directed learning; and</li> <li># have a profound respect for truth and intellectual integrity, and for the ethics of scholarship.</li> </ul>
<b>Assessment:</b>	One assignment which will involve writing a report of around five pages in length about some topic in computer vision and an in-class presentation of around 15 minutes (20%); one programming project during semester, expected to take about 36 hours (30%); and a 2-hour end-of-semester written examination (50%).

<b>Prescribed Texts:</b>	None
<b>Breadth Options:</b>	This subject is not available as a breadth subject.
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Generic Skills:</b>	On completion of this subject students should: # be able to undertake problem identification, formulation and solution.
<b>Notes:</b>	Credit may not be gained for both 433-483 Computer Vision and Image Processing and 433-683 Computer Vision and Image Processing.
<b>Related Course(s):</b>	Bachelor of Computer Science (Honours) Bachelor of Engineering (Computer Engineering) Bachelor of Engineering (Electrical Engineering) Bachelor of Engineering (Mechatronics) and Bachelor of Computer Science Bachelor of Engineering (Software Engineering)