

Module INF-EXP-952: Computer Vision (CV)					
Rota biennially in summer term		Duration 1 semester	Stage see resp. syllabus	Credits* 6	Workload 180 (60/120)
1	Module Structure				
	No.	Element / Course	Type	Credits*	SWS
	1	Computer Vision (CV)	Lecture / V	4	2
	2	Computer Vision Tutorial	Tutorial / Ü	2	2
2	Language: Englisch				
3	<p>Content</p> <p>For the majority of living beings vision is the most important perception mechanism for orienting themselves in the environment. Therefore, there exists a multitude of attempts to recreate this capability in artificial systems. In contrast to image processing techniques found in industrial applications the aim of such advanced systems for machine vision is to obtain a task-oriented interpretation of a complex scene with as few restrictions as possible concerning the context and the recording conditions.</p> <p>In this lecture advanced techniques of machine vision are covered which to some extent are inspired by cognitive processes known from human visual perception. First, important aspects of imaging processes are introduced with an emphasis on the perception of colors. Afterwards, methods for the computation of local feature representations (e.g. texture, depth, or motion) and for the extraction of image primitives (e.g. regions, contours and keypoints) are presented. Finally, the lecture focusses on visual perception processes at the boundary between image processing and scene interpretation. Especially, appearance based object recognition techniques and methods for tracking objects in image sequences will be covered.</p> <p>The accompanying tutorials will give students the opportunity to deepen their knowledge of the theoretical concepts presented in the lecture by working on relevant practical problems.</p> <p><u>Literature</u></p> <ul style="list-style-type: none"> • Gonzalez, Rafael C.; Woods, Richard E.: Digital Image Processing, Prentice Hall, 2nd Ed., 2002. • Forsyth, David A.; Ponce, Jean: Computer Vision - A Modern Approach, Prentice Hall, 2003. • Szeliski, Richard: Computer Vision, Springer, 2010 				
4	<p>Goals</p> <p>In this module students will be made familiar with solutions for advanced problems in the field of machine vision. A fundamental understanding of the principles underlying visual perception systems will enable participants to apply such techniques for themselves in innovative application scenarios - as, e.g., robotics and man-machine interaction - and to assess their strengths and limitations.</p>				
5	<p>Examinations</p> <p><i>Module examination:</i> oral examination (30–45 minutes) <i>Course achievements:</i> as announced The course achievement is a prerequisite for the module examination.</p>				
6	<p>Type of Examination</p> <p><input checked="" type="checkbox"/> Module Examination <input type="checkbox"/> Cumulative Examinations</p>				
7	<p>Requirements[†]</p> <p>–none if attended as a master's degree course –</p>				
8	<p>Module Type and Allocation to Curriculum</p> <p>see regulations for the resp. degree</p>				
9	Responsibility Prof. Dr.-Ing. Gernot A. Fink		Department Computer Science		<small>Beschluss Fakultätsrat 24.09.2014 Änderung Fakultätsrat 22.03.2023</small>

*Bitte beachten Sie, dass die Leistungspunkte je nach Prüfungsordnung abweichen können.

† Bitte beachten Sie, dass die Teilnahmevoraussetzungen je nach Prüfungsordnung abweichen können.