Module Computer Vision

Module Name: Computer Vision

Module Number	X4M 2330	Level	Master	Short Name	CV
Responsible Lecturers	Prof. Dr. Erhardt Barth				
Department, Facility	UZL, Institute of Neuro- and Bioinformatics				
Course of Studies	Biomedical Engineering, Master				
Compulsory/elective	Elective	ECTS Credit Points		4	
Semester of Studies	2	Semester Hours per Week		3	
Length (semesters)	1	Workload (hours)		120	
Frequency	SuSe	Presence Hours		50	
Teaching Language	English	Self-Study Hours		70	
Consideration of Gender and Diversity Issues	☒ Use of gender-neutral language (THL standard) ☐ Target group specific adjustment of didactic methods ☐ Making subject diversity visible (female researchers, cultures etc.)				
Applicability	Biomedical Engineering				
Remarks	None				

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Course 1: Computer Vision Lecture and Exercise

Course Number		Short Name	CV
Course Type	Lecture and exercise	Form of Learning	Presence
Mandatory Attendance	X	ECTS Credit Points	4
Participation Limit	None	Semester Hours per Week	3
Group Size (practical training, exercises, …)	None	Workload (hours)	120
Teaching Language	English	Presence Hours	50
Study Achievements („Studienleistung", SL)	None	Self-Study Hours	70
SL Length (minutes)	n. a.	SL Grading System	n. a.
Exam Type	Oral Exam	Exam Language	English
Exam Length (minutes)	20	Exam Grading System	One-third Grades
Learning Outcomes	Students can understand the basics of computer vision. They can explain and perform camera choice and calibration. They can explain and apply the basic methods for feature extraction, motion estimation, and object recognition. They can indicate appropriate methods for different kinds of computer-vision applications.		
Participation Prerequisites	Basic knowledge in signal processing		
Contents	- Introduction to human and computer vision - Sensors, cameras, optics and projections - Image features: edges, intrinsic dimension, Hough transform, Fourier descriptors, snakes - Range imaging and 3-D cameras - Motion and optical flow - Object recognition - Example applications		
Literature	Richard Szeliski: Computer Vision: Algorithms and Applications. Springer, Boston, 2011 l David Forsyth and Jean Ponce: Computer Vision: A Modern Approach. Prentice Hall, 2003 Hand-out from lecturer		
Remarks	None		