

E – Charakteristika studijního předmětu/Subject Specification				
Název studijního předmětu / Subject title	Image Processing			
Typ předmětu / Subject type	Obligatory selectable		dopor. ročník / semester/ recommended year / semester	2/3
Rozsah studijního předmětu / Study load in hours and credits		hod. za týden / weekly load	2+2 h	Kreditů / Credits
Jiný způsob vyjádření rozsahu / Other expression of study load	15 weeks, each 2h of lectures and 2 hours of seminary			
Způsob zakončení / Assessment	Exam		Forma výuky / Form of teaching	Lectures seminars
Další požadavky na studenta / Other demands on students				
Basic knowledge in computer programming				
Vyučující / Lecturer				
Prof. Dr. rer. nat. Stefan Bischoff				
Stručná anotace předmětu / Subject annotation				
<p>This course provides a general introduction to the fundamental techniques of computer vision and image processing and illustrates their practical application. The main topics are:</p> <ul style="list-style-type: none">- Image acquisition and representation- Preprocessing methods: transformations of pixel brightness and geometry, camera calibration, local operators- Video and audio compression- Image segmentation: thresholding, edge-based and region-based segmentation, Hough transformation, template matching, motion segmentation, optical flow- Feature extraction: color, texture and shape descriptors; Principal Component Analysis (PCA)- Classification: prototypes, cluster analysis, statistical methods, classifiers- Teachable image evaluation: supervised and non-supervised learning, neural networks, Support-Vector-Machine (SVM)- Multi-sensor technology: depth sensors, photogrammetry, 3D scene reconstruction- Overview of current practical application areas: visual quality inspection, robotics, medical diagnosis, video conference systems, biometry, security				
Informace ke kombinované nebo distanční formě / Information for students in external form of study				
Rozsah konzultací (soustředění) / Consultations, study meetings	2 x 3 h		hodin za týden / hours per week	
Rozsah a obsahové zaměření individuálních prací studentů a způsob kontroly / Individual student work – type, load, content and way of checking				
Studijní literatura a studijní pomůcky / Reading list and study utilities				
Bernd Jähne, Digital Image Processing, Springer, 5th edition (April 29, 2002), ISBN: 3540677542				