

## Ergänzende Veranstaltung der School of Engineering

Titel: Visual Perception

Kürzel: EVA\_VPERCEPT

Umfang in Credits	3 ECTS
Veranstalter	Institut für Mechatronische Systeme (IMS) ZHAW
Leistungsnachweis	Written examination on the end of semester.
Startdatum	FS16 Proposed as classroom & on-line course with live video feed.
Art der Durchführung	Weekly 2 Lessons and 1 Lab
Unterrichtssprache	English
Kurzbeschreibung (max. 300 Zeichen)	This module provides in-depth knowledge in perception: the way the machines "see". Visiting this lecture students will be able to design, implement and apply perception algorithms to variety of problems. This knowledge is acquired through the examples and digestible theory.
Modulinhalte und Lernziele	This class aims to teach students about methods and principles of information extraction from 2D and 3D image data. The students will be able to learn theoretical background of 2D and 3D image acquisition, analysis, segmentation and interpretation algorithms. The theory will be applied on several practical examples, such as object detection in ordered environment (production line, lab, etc.) and unordered environment (street, home, grassland, etc.). The surface reconstruction for variety of purposes such as quality control, forensics and HMI will be elaborated too. Students will be able design and implement 2D and 3D image processing algorithms based on state of the art knowledge and modify them for dedicated purposes. The algorithms will be explained and demonstrated using MATLAB and C++. State of the art supporting libraries will be intensively used, OpenCV, PCL, Eigen, etc.
Zulassungsvoraussetzungen	Basic programming skills in procedural or object oriented programming language. Basic statistics knowledge. Basic digital image processing knowledge.
Literatur	References Szeliski, R. (2011), 'Computer vision algorithms and applications', Springer , London; New York .  References Hartley, R. I., & Zisserman, A. (2004). Multiple View Geometry in Computer Vision (Second). Cambridge

## Ergänzende Veranstaltung der School of Engineering

	<p>University Press, ISBN: 0521540518.</p> <p>References Gonzalez, R. C., &amp; Woods, R. E. (2006). Digital Image Processing (3rd Edition). Upper Saddle River, NJ, USA: Prentice-Hall, Inc.</p> <p>References Luhmann, T. (2010). Nahbereichsphotogrammetrie (2nd edition in english 3rd ed. German only). Wichmann Verlag.</p>
Besondere Regelungen	Modern laptop computer able to run virtual machine will be advantageous. Full scale MATLAB 2015b. Fully functional UBUNTU 14.04 or other LTS version.
Kontakt und Auskunft	Prof. Dr.-Ing. Wernher van de Venn, module responsible Dejan Seatovic ( <a href="mailto:sede@zhaw.ch">sede@zhaw.ch</a> ), additional information