Course title: Applied computer vision

Teacher(s): Vladimir M. Mladenovic

Course status: elective

Number of ECTS credits: 10

Condition: None

Course objectives

Preparation for research work in the field of computer vision.

Learning outcomes

A student should understand and master the basic knowledge, theories and methods in image processing and computer vision. A student should gather skills to identifiy, formulate and solve problems in image processing and computer vision. Furthermore, a student should gain knowledge of analyzing, evaluating and examining the existing practical computer vision systems. A student is expected to critically review and evaluate the scientific literature in this field and apply theoretical knowledge to identify the novelty and practicality of the proposed methods. A student should also develop skills to design and develop practical and innovative applications or systems for image processing and computer vision. They behave professionally and responsibly in the areas of image processing of the computer vision of deep learning.

Contents

Theoretical teaching

The course provides an overview of the challenges of computer vision, common approaches and current techniques. The use of specific examples and applications to illustrate, focusing on basic techniques and algorithms. Assuming that students do not have prior knowledge of computer vision, they are introduced to techniques such as the application of deep learning, face recognition and detection, objects, monitoring the results of object calculations and displays on different segments, monitoring semaons and segments.
The reviews of the latest results in the field of computer vision through scientific papers.

Practical teaching

Part of the teaching is realized through independent research work in the field of computer vision. Study research work includes active study of scientific literature, organization and performance of experiments, data processing, writing a scientific paper in the scientific field to which the topic of the doctoral dissertation belongs.

Leterature

[1] D. Forsyth and J. Ponce, *Computer Vision: A Modern Approach*, 2010.

[2] Witold Pedrycz, Shyi-Ming Chen, *Deep Learning: Algorithms and Applications*, 2020, Springer

[3] S. Khan, H. Rahmani, S. Shah and M. Bennamoun, *A Guide to Convolutional Neural Networks for Computer Vision*, 2018 (online version available from a USC account)

[4] Richard Szeliski, *Computer Vision: Algorithms and Applications*, 2010 (online version available at no cost for personal use)

Number of classes of active teaching: 7	Theoretical teaching: 5	Practical teaching: 2

Teaching methods

Lectures, consultations. Study research.

Evaluation (maximum number of points 100)

Homework - 20

Seminar paper - 30

Oral part of the exam - 50