Tárgy neve: Image processing

Tárgyfelelős neve: Dr. Gede Mátyás
Tárgyfelelős tudományos fokozata: PhD
Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja:
a, knowledge
- Complex knowledge of the general geographical, cartographic, planning, mathematical and informatic principles, rules, relationships required for the practice of geoinformatics
- Knowledge of the current theories, models and literature of geoinformatics based on scientific results. He/she is aware of the possible development directions and limits of the field of geoinformatics.
- Knowledge in digital image processing
- Knowledge about geoinformatics programming and application development
b, abilities
- Ability to interpret complex professional problems in the field of geoinformatics, to explore the necessary theoretical and practical background and to solve problems.
- Ability to creatively and methodically process, evaluate, interpret and analyse measurement results and draw conclusions from them.
c, attitude
- Accepts and adheres to the ethical principles of work and organizational culture, especially with regard to the copyright related to geoinformatics.
- Committed to adhering to and making others adhere to quality requirements.
d, autonomy and responsibility
- Independence regarding the thorough examination and elaboration of professional issues and processes.
- Feels responsible for meeting and making others meet the deadlines. He/she is responsible for his/her work and for his/her co-workers' work in projects.
- With his/her knowledge and skills of geoinformatics, he/she cooperates responsibly with professionals in other fields.

Az oktatás tartalma:
 Digital image processing and computer vision fundamentals and its use in geoinformatics
- Introduction to OpenCV/Python
- Basic image operations: load, display, crop, save. Various image representations (RGB, HSV, grayscale, binary) and conversions between them.
- Drawing operations
- Fundamentals of convolutional filters, most common kernel types
- Edge detection, line detection
- Feature detection. Training and using HAAR Cascades
- Character and text recognition using PyTesseract
- Camera calibration, stereo image evaluation

A számonkérés és értékelés rendszere: practical course mark based on course work.

Kötelező irodalom:
- Adrian Rosebrock: Practical Python and OpenCV. 2016.
  https://www.pyimagesearch.com/practical-python-opencv/
- Joseph Howse, Joe Minichino: Learning OpenCV 4 Computer Vision with Python 3. Packt, 2020. ISBN: 9781789531619

Ajánlott irodalom:
- Mokhtar Ebrahim: Python Image Processing Tutorial (Using OpenCV).
  https://likegeeks.com/python-image-processing/

- GeeksforGeeks: OpenCV Python Tutorial. https://www.geeksforgeeks.org/opencv-python-tutorial/