



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez
Unię Europejską w ramach
Europejskiego Funduszu
Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY



| | | | |
|--|-----------------------|---|-------------------------|
| Course title | | ECTS code | |
| Image Processing in Python | | 11.3.1586 | |
| Name of unit administrating study | | | |
| null | | | |
| Studies | | | |
| faculty | field of study | type | first tier studies (BA) |
| Faculty of Mathematics, Physics and Informatics | Informatics | form | full-time |
| | | specialty | all |
| | | specialization | all |
| | | | |
| Teaching staff | | | |
| dr Ekaterina Cichosz | | | |
| Forms of classes, the realization and number of hours | | ECTS credits | |
| Forms of classes | | 5 30 hours - lectures, 30 hours - exercises, student's individual work | |
| Wykład (to translate), Ćw. laboratoryjne (to translate) | | | |
| The realization of activities | | | |
| lectures in the classroom | | | |
| Number of hours | | | |
| Ćw. laboratoryjne (to translate): 30 hours, Wykład (to translate): 30 hours | | | |
| 2021/2022 summer semester | | | |
| Type of course | | Language of instruction | |
| elective (to translate) | | english | |
| Teaching methods | | Form and method of assessment and basic criteria for evaluation or examination requirements | |
| <ul style="list-style-type: none"> - Metoda projektów (projekt badawczy, wdrożeniowy, praktyczny) (to translate) - Wykład z prezentacją multimedialną (to translate) | | Final evaluation | |
| | | <ul style="list-style-type: none"> - Zaliczenie na ocenę (to translate) - Egzamin (to translate) | |
| | | Assessment methods | |
| | | <ul style="list-style-type: none"> - egzamin pisemny testowy (to translate) - wykonanie pracy zaliczeniowej - wykonanie określonej pracy praktycznej (to translate) - wykonanie pracy zaliczeniowej - projekt lub prezentacja (to translate) | |
| | | The basic criteria for evaluation | |
| | | Laboratory: <ul style="list-style-type: none"> • 100% evaluation of implemented projects Lecture: <ul style="list-style-type: none"> • 40% evaluation of theoretical knowledge • 60% evaluation of implemented projects | |
| Sposób weryfikacji założonych efektów kształcenia (DO TŁUMACZENIA) | | | |
| Required courses and introductory requirements | | | |
| A. Formal requirements | | | |
| None | | | |
| B. Prerequisites | | | |
| Basic programming skills in Python | | | |
| Aims of education | | | |
| The course covers the basics of Digital Image Processing and implementation of its techniques in Python. | | | |
| Course contents | | | |

1. **Introduction:** image processing applications, fundamental steps in image processing, image acquisition, digital image definition, image sampling and quantization.
2. **Fundamentals:** image interpolation, basic mathematical tools, geometrical image transformations, cropping an image, resizing an image, converting to a grayscale-image, adding text on the image, statistics of an image.
3. **Intensity Transformations and Spatial Filtering:** histogram, plotting histograms, histogram equalization, spatial filters (smoothing, sharpening), contrast, lightness, color and grayscale images, two-image operations.
4. **Filtering in the Frequency Domain:** sampling, aliasing in images.
5. **Color Image Processing:** color models, pseudo color image processing, color transformations.
6. **Image Compression and Watermarking:** types of data redundancy, lossy and error-free compression, types of watermarks.
7. **Morphological Image Processing:** basic tools (erosion, dilation, opening, and closing), smoothing, edge detection, extracting connected components, and skeletonizing.
8. **Image Segmentation:** edge detection, thresholding.

Bibliography of literature

Gonzales, R.C. *Digital Image Processing*.

A student knows the basics of Digital Image Processing.

A student can implement the basic Digital Image Processing techniques in Python.

Knowledge

A student knows the basics of Digital Image Processing.

Skills

A student can apply the basic Digital Image Processing techniques in Python.

Social competence

Contact

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