



## Subject card

|   |   |  |                                 |                                     |         |  |     |
|---|---|--|---------------------------------|-------------------------------------|---------|--|-----|
| Subject name and code                       | Computer vision, PG_00053374  |  |                                 |                                     |         |  |     |
| Field of study                              | Biomedical Engineering, Biomedical Engineering, Biomedical Engineering  |  |                                 |                                     |         |  |     |
| Date of commencement of studies             | February 2022   | Academic year of realisation of subject                  |                                 |                                     |         | 2022/2023  |     |
| Education level                             | second-cycle studies  | Subject group  |                                 |                                     |         | Optional subject group<br>Subject group related to scientific research in the field of study |     |
| Mode of study                               | Full-time studies   | Mode of delivery   |                                 |                                     |         | at the university  |     |
| Year of study                               | 1   | Language of instruction                                  |                                 |                                     |         | Polish   |     |
| Semester of study                           | 2   | ECTS credits   |                                 |                                     |         | 4.0  |     |
| Learning profile                            | general academic profile  | Assessment form  |                                 |                                     |         | exam   |     |
| Conducting unit                             | Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics  |  |                                 |                                     |         |  |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr inż. Magdalena Mazur-Milecka |                                     |         |  |     |
|   | Teachers  |  | dr inż. Magdalena Mazur-Milecka |                                     |         |  |     |
| Lesson type and method of instruction       | Lesson type   | Lecture  | Tutorial                        | Laboratory                          | Project | Seminar  | SUM |
|   | Number of study hours   | 30.0   | 0.0                             | 15.0                                | 15.0    | 0.0  | 60  |
|   | E-learning hours included: 0.0  |  |                                 |                                     |         |  |     |
| Learning activity and number of study hours | Learning activity   | Participation in didactic classes included in study plan |                                 | Participation in consultation hours |         | Self-study   | SUM |
|   | Number of study hours   | 60   |                                 | 5.0                                 |         | 35.0   | 100 |
| Subject objectives                          | The aim of the course is to familiarize students with computer vision algorithms, with particular emphasis on neural networks and machine learning based methods. |  |                                 |                                     |         |  |     |

| Learning outcomes | Course outcome   | Subject outcome   | Method of verification                               |
|-------------------|--|---|--|
|                   | [K7_U02] can perform tasks related to the field of study as well as formulate and solve problems applying recent knowledge of physics and other areas of science   | The effect of the learning process is the ability of the student to correctly solve real problems of computer vision in the field of biomedical engineering, appropriate selection of methods and evaluation of results.  | [SU1] Assessment of task fulfilment                  |
|                   | K7_U04   | The effect of the learning process is the student's gaining the ability to use the acquired knowledge in practice on computer vision algorithms: the use of appropriate methods and tools, evaluation of their effectiveness through the use of appropriate measures and their correct interpretation.                | [SU4] Assessment of ability to use methods and tools |
|                   | [K7_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices | The effect of the learning process is the student's acquisition of knowledge in the field of knowledge and the ability to apply programming methods and techniques as well as libraries used in solving computer vision issues, including detection and segmentation of objects, image recognition or classification. | [SW1] Assessment of factual knowledge                |
|                   | [K7_W03] Knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum.   | The effect of the learning process is the acquisition of knowledge by the student in the field of theories and methods dedicated to solutions to computer vision in biomedical engineering.   | [SW1] Assessment of factual knowledge                |



|  | eResources addresses  |  |
|--|---|--|
| Example issues/<br>example questions/<br>tasks being completed | 1. Autoencoders and GAN<br><br>2. Object detection<br><br>3. Face recognition<br><br>4. Segmentation<br><br>5. Image classification - inference on mobile devices |  |
| Work placement   | Not applicable  |  |