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| Module name | **Team Assignment Machine Learning and Computer Vision** |
| Module number | CMS-TRK-TEA-MLCV |
| Senior Lecturer | Prof. Dr. Björn Andres<br>bjoern.andres@tu-dresden.de |
| Qualification objectives | Students are able to work on a complex research-related project that requires competences from several areas of applied artificial intelligence. Students are able to solve a larger, typically interdisciplinary, challenge within a group from the field of applied artificial intelligence. They are proficient in literature research and the use of scientific information sources, and have both in-depth expertise and extensive methodological and interpersonal skills in project management and teamwork. |
| Contents | The content of the module is the analysis of an optimisation problem from the fields of machine learning and computer vision, the definition and implementation of an algorithm to precisely or approximately solve this problem, the analysis of this algorithm in terms of its complexity and approximation properties, and the quantitative empirical analysis of this algorithm in its application to concrete data. |
| Forms of teaching and learning | The module includes 8 SWS projects and self-study. The language of the projects will be English. |

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| Eligibility for participation | Skills in algorithms and data structures, basics of theoretical informatics, analysis of univariate and multivariate functions, linear algebra, probability calculation and statistics at bachelor level are required. The following literature is suitable for preparation:<br>1. Algorithms and Data Structures. Kurt Mehlhorn, Peter Sanders. Springer Berlin Heidelberg, 2008. ISBN: 978-3-540-77977-3. DOI: 10.1007/978-3-540-77978-0,<br>2. Analysis 1. Konrad Königsberger. Springer Berlin Heidelberg, 2004. ISBN: 978-3-540-40371-5. DOI: 10.1007/978-3-642-18490-1,<br>3. Analysis 2. Konrad Königsberger. Springer Berlin Heidelberg, 2013. ISBN: 978-3-662-05699-8. DOI: 10.1007/978-3-662-05699-8,<br>4. Linear algebra. Gerd Fischer. Springer Spektrum Wiesbaden, 2014. ISBN: 978-3-658-03945-5. DOI 10.1007/978-3-658-03945-5,<br>5. Introduction to probability theory and statistics. Ulrich Krengel. Vieweg+Teubner Wiesbaden, 2013. ISBN: 978-3-322-93581-6. DOI: 10.1007/978-3-322-93581-6,<br>6. Theoretical informatics. Lutz Priese, Katrin Erk. Springer Vieweg Berlin Heidelberg, 2018. ISBN: 978-3-662-57408-9. DOI: 10.1007/978-3-662-57409-6. |
| Usability | In the Computational Modeling and Simulation Masters Course, the module is a compulsory voting module in the Track Applied Artificial Intelligence, to be selected in accordance with Annex 2 to the Specific Examination Regulations. The module cannot be chosen in the Master's Course Computational Modeling and Simulation if this or a module with substantially the same content from a Course with which the entry conditions under § 3 of the Studienordnung have been met has already been completed. The module provides the pre-requisites for the modules it designates under the pre-requisites for participation. |
| Conditions for the award of credits | Credits are awarded when the module test is passed. The module test consists of a complex performance of 60 hours. The language of the test will be English. |
| Credits and marks | The module allows for the award of 10 credit points. The module score corresponds to the test performance score. |
| Frequency of the module | The module is offered every summer semester. |
| Workload | The total workload is 300 hours. |
| Duration of the module | The module covers 1 semester. |