Tárgy neve: AUS lab I.-II.

Tárgyfelelős neve: Fridli Sándor

Tárgyfelelős tudományos fokozata: PhD

Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja angolul / Aim of the subject:

Knowledge

- Possession of complex and up-to-date knowledge in software technology, regarding the design, implementation, operation and maintenance of software, in the following areas: software architectures and design patterns; model-driven software development; UML and its application in object-oriented and component-based design; embedded and real-time systems; reliability and validation of software; testing techniques.
- Knowledge on the methods of architecture description and design.
- Knowledge of the principles of business and enterprise processes, project organization within enterprises, the relationships with the project and programme management.
- Detailed and expert-level knowledge of the technical terms and expressions of computer science in English.
- Possession of complex and up-to-date knowledge on administrative law background of the development, testing and licensing of automated vehicles.
- Possession of complex and up-to-date knowledge on regulation, human rights and data protection issues of autonomous vehicles.
- Possession of complex and up-to-date knowledge in AI, process automation, control and optimal control, signal and image processing regarding the trends and the goals of developments in Smart Factories and Cyber-Physical Systems, including uncertainty, stochastic environments, and risks.
- Detailed and expert-level knowledge of the technical terms and expressions of legal framework of autonomous vehicles.
- Possession of required knowledge in mathematics and process control, especially in the following areas: system and control theory, numerical methods, optimization methods.
- Detailed and expert-level knowledge of the technical terms and expressions of computer science in English.
- Ability to formalize complex technical problems, to analyze theoretical and practical background, and to provide adequate solutions.
- Expertise in design, development, operation and management tasks in the domain of complex data analytics systems.

Abilities:

- Expertise in the application of the concepts and methods of software technology in modeling of complex software and architecture design.
- Ability to formalize complex technical problems, to analyze theoretical and practical background, and to provide adequate solutions.

- Expertise in design, development, operation and management tasks in the domain of complex software systems.
- Expertise in project planning and management tasks in the domain of complex software systems and database management systems.
- Expertise in the application of the concepts and methods of data science in complex data mining tasks as well as preparation of data science models according to requirements of data mining tasks.
- Ability to formalize complex technical problems, to analyze theoretical and practical background, and to provide adequate solutions.
- Expertise in design, development, operation and management tasks in the domain of complex data analytics systems.
- Skills for cooperation and team work, and ability to take leading role.
- Ability for written and oral communication in English, using the technical terms and expressions of computer science. Ability to argue, to prepare reports, to read, understand and exploit scientific and technical material (e.g. books and papers).
- Expertise in utilizing sources of technical information, their critical interpretation and evaluation, and the extraction of information relevant to the solution of a specific problem.
- Understanding the testing challenges, approaches that works and that do not.
- Understanding how to take part and perform complex test projects in automotive
- Ability to understand code coverage for automotive safety integrity levels (ASIL) required by standards and norms such as ASPICE and ISO 26262.
- Ability for written and oral communication in English, using the technical terms and expressions of computer science.
- Ability to argue, to prepare reports, to read, understand and exploit scientific and technical material (e.g. books and papers).
- Ability to design and implement tests
- Expertise in utilizing sources of technical information, their critical interpretation and evaluation, and the extraction of information relevant to the solution of a specific problem.
- Ability to perform supervised scientific research, and skills required for post-graduate studies.
- Ability to analyse, planning and evaluate the process of developing, testing and licensing of autonomous vehicles from a legal point of view.
- Skills for cooperation and team work.
- Ability for written and oral communication in English, using the legal terms and expressions

Attitude:

- Attends professional, technological development related to their qualification.
- Commitment to critical feedback and self-assessment.
- Commitment to lifelong learning and receptivity to new IT competencies.
- Adopts and coordinates the ethical principles of work, organizational culture and research.
- Commitment to quality standards and its IT tools.

- Open to initiate collaboration with IT and other specialists.
- Shares professional knowledge, mediates professional results.
- Mediates and implements eco-conscious behavior and social responsibility, helping them with tools.
- Demonstrates and implements eco-conscious behavior and social responsibility, helping them with IT tools.
- Commitment to quality standards and its IT tools.
- Open to initiate collaboration with IT and other specialists.

Autonomy, responsibility:

- Takes responsibility for his professional decisions taken during his professional activities.
- Takes responsibility for observing and enforcing deadlines.
- Takes responsibility for own and fellow workers' work.
- In the case of operational critical IT systems, he/she can be assigned responsibility for development and operation, according to his/her professional competencies.

Az oktatás tartalma angolul / Major topics:

- Improving problem solving skill via solving problems that originated in or inspired by real applications.
- Improving research and innovation skills:
 - studying professional literature,
 - determining and solving tasks,
 - implementing state-of-the-art algorithms in adequate programming languages
 - planning simulations, comparison tests,
 - evaluation, analysis, documentation of test results,
 - presentation of results in MSc thesis, publications, talks etc.,
 - preparation for PhD studies.
- Developing skills for team working:
 - participation in applied research projects,
 - training for international competitions.

Work in AUS lab should be performed in the major areas of the Computer Science for Autonomous Systems MSc training: 3D sensing, signal and image processing, numerical optimization, data science, deep learning, sensors, embedded systems.

A számonkérés és értékelés rendszere angolul / Requirements and evaluation:

Practice grade