MODULE A - Basics: AI and society (Lecture)

In the lecture, knowledge is imparted through presentations by the lecturers. At the end of the lecture, a written examination is conducted.

Content:

Technical Aspects
- Learning computational thinking as a basis for understanding and implementing AI applications
- Machine Learning: Learning the fundamentals of various learning algorithms and their applications
- Generative Methods: Learning the basics of Natural Language Processing and their application in the form of large language models. Outlook on other generative methods such as image and music generation
- Decision Support Systems: Learning the technical foundations of systems that underlie, for example, the recommendation of content on social media platforms or Google search

Ethical Aspects
- Fundamentals of ethics and technology ethics: systems, theories, central concepts
- Responsibility and accountability regarding the development and use of AI
- Justice and discrimination in the use of AI
- Ethical considerations regarding transparency and explainability of algorithms
- Alignment of AI with fundamental moral and societal values (Value Alignment)
- Safety in the use of and trust in AI

Legal Aspects
- Introduction to legal issues of Artificial Intelligence: legal sources, development history, areas of application, legal requirements for the use of AI systems, regulation of AI (EU-AI Act), liability for AI
- Data protection law: fundamentals, responsibilities, legal bases, definition of personal data, lawfulness of data processing, information obligations, data protection impact assessment (DPIA), reporting obligations for data protection violations, special requirements when using AI, especially with regard to the General Data Protection Regulation (GDPR) and the EU-AI Act.
- Liability law: fundamentals, requirements, legal consequences, and limits of civil liability when using AI systems, especially with regard to the Product Liability Act (ProdHaftG) as well as the EU-AI Act.
- Copyright law: fundamentals, requirements, scope, and limitations of copyright protection for AI-generated works, use of copyrighted works as training data for AI applications

Economic Aspects
- Explain possible applications of AI in organizations and especially the possibility of new business models
- Recognize opportunities and risks of AI with regard to organizations
- Understand the impact of AI systems on the working world and explain the skills required in the future

Educational Aspects
- Analyze implications of AI systems for education and derive future competencies
- Identify and evaluate opportunities and challenges of AI in pedagogical contexts of various educational levels
- Explain effects of AI applications in the educational context, especially in testing

Expected Learning Outcomes and Acquired Competences:

After completing this sub-module, students will be able to:

Technical Aspects
- Apply computational thinking to illustrate the potential applications of AI systems
- Identify the application areas of different learning algorithms
- Explain the functionality of generative models and name their advantages and disadvantages
- Explain the functionality of decision support systems in the area of content recommendation and ranking and analyze their influence on human decision-making

Ethical Aspects
- Apply central moral philosophical concepts to different AI debates
- Recognize, formulate, and analyze relevant ethical questions regarding the development and use of AI

Legal Aspects
- Identify and apply the legal sources relevant to the use of AI systems
- Recognize legal risks for the use of AI systems and identify the associated problem areas
- Name the legal requirements for the use of AI according to the EU AI Act and the GDPR
- Identify central problems of the use of AI in various sub-disciplines of law and trace the legal discussion (regulation according to the AI Act, liability, data protection law, copyright law, civil liability)

Economic Aspects
- Name possible applications of AI in organizations and especially the possibility of new business models
- Discuss opportunities and risks of AI with regard to organizations
- Explain the impact of AI systems on the working world and draw conclusions for their own career planning

Educational Aspects
- Explore connections between AI use and educational dynamics and identify necessary competencies for the digital future
- Differentiate potentials and limitations of AI in educational environments and assess their relevance for pedagogical processes and for testing.