FERIT.AIxperience 2025

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FERIT.AIxperience 2025 offers an engaging program focused on the exploration, application and education of artificial intelligence. The event will take place from February 10 to 14, 2025, at the FERIT campus premises, aiming to bring together students, the academic community and industry professionals.

Participants will gain insights into the latest trends, tools and applications of artificial intelligence across various fields.

- Lectures
- Workshops
- AI Meet.ing
- PhD Meet.ing
- Panel Discussion

SHAPING THE FUTURE OF AI

FERIT
FACULTY OF ELECTRICAL ENGINEERING, COMPUTER
SCIENCE AND INFORMATION TECHNOLOGY **OSIJEK**

February 10–14, 2025 • Cara Hadrijana 10b, Osijek

FERIT.AIxperience 2025

MON feb 10

Opening Ceremony
AI meet.ing
11:30h, K2-1

- Deep Learning in Medical Image Analysis for Personalized Medicine — Prof. Irena Galić, PhD, FERIT
- Application of AI in Modern Vehicles — Prof. Mario Vranješ, PhD, FERIT
- Deepfakes vs. Synthetic Data: Threats or Tools for Progress? — Associate prof. Emmanuel Karlo Nyarko, PhD, FERIT
- Robots and Agriculture: AI Transformation — Assistant prof. Petra Pejić, PhD, FERIT

TUE feb 11

Lecture
15:00h, K2-1

- Introduction to AI — Associate prof. Emmanuel Karlo Nyarko, PhD, FERIT

Workshop
16:00h, K3-1

- Basics of Data Analysis: From Cleaning to Drawing Conclusions — Mario Dudjak, PhD, FERIT

WED feb 12

Lecture
15:00h, K2-1

- Convolutional Neural Networks: Looking Inside the Black Box — Marin Benčević, PhD, FERIT

Workshop
16:00h, K3-1

- Bridging Classical Image Processing and Deep Learning: CNN Model Optimization — Marin Benčević, PhD, FERIT

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program schedule

THU feb 13

PhD meet.ing 11:30h, K2-1	• Artificial Intelligence in Research	PhD students, FERIT
Lecture 15:00h, K2-1	• Gentle Introduction to Prompt Engineering and Large Language Models	Assistant prof. Hrvoje Leventić, PhD, FERIT
Workshop 16:00h, K3-1	• Create Your Personalized AI Learning Assistant	Prof. Marijan Herceg, PhD FERIT

FRI feb 14

Panel Discussion 11:30h, K2-1	• AI and the Future of Education: Transforming Teaching and Learning	Juraj Bilić, Carnet Sanja Simel Pranjić, FFOS Marijan Herceg, FERIT
Lecture 15:00h, K3-1	• How to Train Your Drag... Agent?	Associate prof. Ratko Grbić, PhD, FERIT
Workshop 16:00h, K3-1	• Reinforcement Learning: How Do Bots Learn by Playing Against Themselves?	Matej Džijan, PhD FERIT

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Title: Deep Learning in Medical Image Analysis for Personalized Medicine

Speaker: Prof. Irena Galić, PhD

Description: The continuous advancement of artificial intelligence, particularly in deep learning techniques, has significantly improved various domains within medicine, enabling unprecedented accuracy and efficiency in numerous applications. The integration of machine learning methods into the healthcare sector has brought transformative improvements with substantial potential to enhance medical practice and diagnostic capabilities. These advanced computational techniques have revolutionized the way medical professionals extract meaningful information from complex visual data.

Title: Application of AI in Modern Vehicles

Speaker: Prof. Mario Vranješ, PhD

Description: The aim of the lecture is to familiarize the audience with cases of the use of artificial intelligence in modern vehicles. The idea is to show how it contributes to increasing the safety of all road users. Modern vehicles are able to make certain driving decisions themselves with the help of AI-based systems. Through additional communication with the infrastructure, which is also supported by AI solutions, they will achieve a full degree of autonomy in the future.

Title: Deepfakes vs. Synthetic Data: Threats or Tools for Progress?

Speaker: Associate prof. Emmanuel Karlo Nyarko, PhD

Description: Deepfakes represent the dark potential of synthetic media. They enable realistic fakes that fuel disinformation, privacy violations,and social mistrust. On the other hand, synthetic data offers a promising solution to drive innovation while protecting privacy, combating data scarcity and promoting fair AI development. This talk explores the common origins of these technologies and how the same tools can serve very different purposes. We will look at how deepfakes are created, their growing applications and the ethical and societal risks they pose. Conversely, we will explore how synthetic data is generated and the transformative role it plays in areas such as healthcare, finance and autonomous systems.

Title: Robots and Agriculture: AI Transformation

Speaker: Assistant prof. Petra Pejić, PhD

Description: This talk will present the key role of robotics and artificial intelligence in addressing the challenges and opportunities in agriculture in the face of rapidly growing world population and food demand. During the talk, the current application of robotics in agriculture will be considered and the existing hardware and software challenges that make it difficult to fully automate such systems will be highlighted. Despite these challenges, the potential for innovation is great, driven by market growth and support for sustainable practices from governments around the world. The presentation will also discuss key issues around the feasibility and effectiveness of agricultural robots to better equip the sector to sustainably feed a growing population.

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Title: Introduction to AI

Speaker: Associate prof. Emmanuel Karlo Nyarko, PhD

Description: This lecture provides a basic introduction to Artificial Intelligence (AI). It begins with a definition of AI and its importance in everyday life, followed by a historical overview that highlights the most important milestones in its development. The main AI concepts, including machine learning, deep learning and neural networks, are introduced and the main techniques used by machines to learn are explored.

Title: Basics of Data Analysis: From Cleaning to Drawing Conclusions

Speaker: Mario Dudjak, PhD

Description: The workshop provides an introduction to the fundamental aspects of data analysis, focusing on the practical steps of data processing, analysis and interpretation. Participants will acquire knowledge on the use of relevant tools for:

Data cleansing and processing - Preparation of "raw" data" for analysis.

Describing and visualizing data - using statistical methods and graphical representations to identify patterns and trends.

Analyzing data - applying statistical methods and basic machine learning techniques.

Communicating results - visualizing and interpreting conclusions to make informed decisions.

The workshop focuses on practical application, with examples to facilitate the understanding and implementation of the concepts learned. It is primarily aimed at beginners in the field of data analysis and data science.

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Title: Convolutional Neural Networks: Looking Inside the Black Box

Speaker: Marin Benčević, PhD

Description: This lecture will take you on a journey through the inner workings of Convolutional Neural Networks (CNN), giving you a deep understanding of how they actually work. Instead of just learning the theory, we will visualize and understand what happens in each layer of the network - from simple edge detection to complex shapes. Through interactive examples, you will discover how the network "sees" images, how it makes decisions, and why it sometimes makes mistakes. After the lecture, CNN will no longer be a mysterious black box, but an understandable tool whose behavior you can predict and explain.

Title: Bridging Classical Image Processing and Deep Learning: CNN Model Optimization

Speaker: Marin Benčević, PhD

Description: In this hands-on workshop, you will combine traditional image processing techniques with modern CNN architectures to achieve optimal results. Using the intuition you have gained about how neural networks work, you will learn how image preprocessing can dramatically affect model performance. By experimenting with different sizes and types of datasets, you will discover how the quality and quantity of data affect the network's learning. Special emphasis will be placed on recognizing and avoiding common pitfalls in neural network development - from overtraining to problems with data distribution. This workshop will provide you with practical tools to develop more robust and reliable CNN models.

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Title: Gentle Introduction to Prompt Engineering and Large Language Models

Speaker: Assistant prof. Hrvoje Leventić. PhD

Description: This lecture offers a gentle introduction to the world of Large Language Models (LLMs) and prompt engineering, requiring no advanced technical background. As artificial intelligence becomes increasingly present in our lives, understanding how to effectively communicate with AI systems like ChatGPT or Claude is becoming an essential skill for professionals and enthusiasts alike. It's particularly important to understand how they work and why they respond the way they do. During the lecture, participants will familiarize themselves with fundamental concepts of language model operation, key principles of writing effective prompts, and the capabilities and limitations of current AI systems. Special emphasis will be placed on understanding best practices in prompt formulation and demystifying model configuration parameters.

Title: Create Your Personalized AI Learning Assistant

Speaker: Prof. Marijan Herceg, PhD

Description: The workshop "Create Your Personalized AI Learning Assistant" is designed to provide participants with hands-on experience in building an AI assistant for learning using the LangChain framework. During the workshop, participants will learn how to utilize key parameters of large language models, including: Temperature (to control the creativity of responses), Top_p and Top_k (to filter word choices based on their probabilities), Max tokens (to limit the length of responses), And other parameters for optimizing model performance. They will gain insights into writing system prompts to define the assistant's personality, behavior, and predefined response patterns. Also, they will use external documents as a source of knowledge to ensure the assistant provides accurate and relevant learning information. The workshop is intended for anyone looking to develop practical skills in creating AI assistants, customizing AI tools to specific needs, and exploring the potential of artificial intelligence to enhance the learning process.

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program schedule
friday

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Title: AI and the Future of Education: Transforming Teaching and Learning

Speakers: Juraj Bilić, Carnet
Sanja Simel Pranjić, FFOS
Marijan Herceg, FERIT

Description: The panel discussion "AI and the Future of Education: Transforming Teaching and Learning" explores the impact of artificial intelligence and AI tools on various aspects of education, with a special focus on higher education. Experts in psychology, teaching methodologies, and technology will discuss the benefits and challenges that AI brings to the context of learning, teaching, and assessment. Participants will share experiences and best practices while exploring how the integration of AI can enhance the educational process and ensure quality education. This event presents an opportunity for dialogue among educational leaders, innovators, and students about the future of education in the age of digitalization.

Title: How to Train Your Drag... Agent?

Speaker: Associate prof. Ratko Grbić, PhD

Description: Imagine you are playing a video game in which you have to overcome various obstacles and fight with opponents to score points and progress in the game. In the beginning, you may not be very skillful and lose a lot of lives (nerves), but as you explore the game, you get better and know what to do. Every time you make a good move, you get points or move up a level, and every time you make a mistake, you lose a life or have to go back to the beginning. Ultimately, the aim of the game is to improve your skills to become better and faster, avoid mistakes and collect as many points as possible. This is an example of how reinforcement learning (RL) works - an area of machine learning that is being intensively researched today. This talk provides an introduction to the concept of reinforcement learning. An agent (like a player in a video game) tries to optimize its behavior by interacting with the environment, receiving feedback in the form of rewards and punishments. We will illustrate the basic terms and concept of learning by solving a simple RL problem within the Open AI Gym (Gymnasium) library.

Title: Reinforcement Learning: How Do Bots Learn by Playing Against Themselves?

Speaker: Matej Džijan, PhD

Description: The aim of the workshop is to introduce the participants to reinforcement learning using the example of a video game in which agents (bots) only play against themselves and thus become better at the game. During the workshop, participants will learn about deep reinforcement learning and train their agents to play a video game. The workshop ends with a tournament in which the participants' agents compete against each other.

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Got any questions?

If you need any additional information about
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