Deep Layers

WORKSHOP / ARTIFICIAL INTELLIGENCE

22. - 23. 10 . 2024

Institute of Scientific Instruments of the Czech Academy of Sciences

Deep Layers
a machine-learning forum

The Czech Academy of Sciences
Strategy AV21
Top research in the public interest

brno ai

AI MT

Průlomové technologie budoucnosti

ISI CAS

PROGRAM / Tuesday / 22. 10. 2024 - Tutorials

09:00 - 9:10   Foreword by **DeepLayers 2024** organizers

09:10 - 9:20   **What is the AI (today)**
by F. Plesinger (ISI of the CAS, CZ)

09:20 - 10:30   **Machine-learning Elements I: Data treatment**
set of apporaches to explore, understand and clean
your data by F. Plesinger (ISI of the CAS, CZ)

10:30 - 10:45   **Coffee break**

10:45 - 11:45   **Machine-learning Elements II: Modelling tutorial**
by M. Kolajova (ISI of the CAS, CZ)
- Experiments with easy-to-use models
- How to understand model outputs

11:45 - 12:45   **Lunch (provided)**

12:45 - 13:45   **Deep-learning (DL) Elements I**
by V. Hrtonova (ISI of the CAS, CZ)
- Building blocks of DL networks
- Data Preprocessing for DL

13:45-14:00   **Coffee break**

14:00 - 15:00   **Deep-learning Elements II**
by Z. Koscova (ISI of the CAS, CZ)
- Common DL architectures

PROGRAM / Wednesday / 23.10.2024 - Applications

09:00 - 09:30 **Enhancing Transmission Electron Microscopy with AI/ML: Practical Applications and Integration** by B. Hesko (TESCAN)

09:30 - 10:00 **Graph Neural Networks for Automated Planning of Epilepsy Surgery** by V. Hrtonova (ISI of the CAS, CZ)

10:00 - 10:15 **Coffee break**

10:15 - 10:45 **Prediction of Perfusion Parameters from MRI Data using a Self-Supervised CNN** by D. Hyvlova (ISI of the CAS, CZ)

10:45 - 11:15 **Sound Event Detector** by L. Svoboda (Jalud Embedded)

11:15 - 11:45 **Race for a Synchronous Heart: Reducing Surgery Time with AI** by F. Plesinger (ISI of the CAS, CZ)

11:45 - 12:45 **Lunch (provided)**

12:45 - 13:15 **Medical Device Development Methodology** by M. Sliva (Aireen)

13:15 - 13:45 **AI agents with RAG: Retrieval-Augmented Generation** by A. Gono (Citymind solutions)

13:45 - 14:00 **Coffee break**

14:00 - 14:30 **From Sleep Patterns to Heart Rhythms: Predicting Atrial Fibrillation from overnight Polysomnograms** by Z. Koscova (ISI of the CAS, CZ)

14:30 - 15:00 **IT4Innovations national supercomputing center: environment for AI applications** by V. Vondrak (IT4Innovations)

THE PROGRAMME MIGHT CHANGE

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Deep Layers forum will serve as a place to connect people, share knowledge, compare approaches and see how specific model architectures can help to solve particular tasks. The meeting is organized by a scientific group of Artificial Intelligence and Medical Technologies with the support of the Brno.AI cluster and financial support of Czech Academy of Sciences - Strategie AV21.

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