Deep Layers

WORKSHOP / ARTIFICIAL INTELLIGENCE

20. - 21. 9 . 2022

Institute of Scientific Instruments of the Czech Academy of Sciences
Kralovopolska 147, Brno, Czech Republic

Deep Layers
a machine-learning forum

STRATEGIE AV21

brno ai

AI MT

Průlomové
technologie
budoucnosti

ISI
CAS

PROGRAM / Tuesday / 20. 9 . 2022 - Tutorials

09:30 - 9:35   Foreword by **DeepLayers 2022** organizers

09:35 - 9:45   **What is the AI (today)** by F. Plesinger (ISI of the CAS - AIMT, Brno, CZ)

09:45 - 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 - AIMT)

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

10:45 - 12:00   **Machine-learning Elements II: Modelling tutorial** by F. Plesinger (ISI of the CAS - AIMT, Brno, CZ)
- Experiments with easy-to-use models
- How to understand model outputs
- Understanding feature importance

12:00 - 13:00   **Lunch (provided)**

13:00 - 13:45   **Deep-learning (DL) Elements I**
- Building blocks of DL networks by P. Nejedly (ISI of the CAS - AIMT, Brno, CZ)
- Data Preprocessing for DL by J. Pavlus (ISI of the CAS - AIMT, Brno, CZ)

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

14:00 - 15:15   **Deep-learning Elements II**
- Common DL architectures by K. Pijackova (ISI of the CAS - CNS, CZ)
- Semantic Segmentation of Medical Images using DL by F. Lux (MU-FI, Brno, CZ)

PROGRAM / Wednesday / 21. 9 . 2022 - Applications

9:30 - 10:00 **Actual Life Applications of AI**
by A. Novozamsky (UTIA, Prague, CZ)

10:00 - 10:25 **Speech Separation and Generative Adversial Networks**
by J. Pavlus (ISI of the CAS - AIMT, Brno, CZ)

10:25 - 10:50 **Poster session (with coffee break)**

10:50 - 11:20 **Neuroscience vs AI: Spiking Networks** by P. Nejedly (ISI of the CAS - AIMT, Brno, CZ)

11:20 - 11:35 **AI in Epilepsy Research:** by B. Chybowski (University of Edinburgh, UK)

11:35 - 11:50 **Not Enough Data I: Transfer Learning** by Z. Koscova (ISI of the CAS-AIMT, Brno, CZ)

11:50 - 12:05 **Not Enough Data II: Generating Artificial Datasets** by A. Ivora (BeamNG GmbH, Bremen, DE)

12:05 - 13:00 **Lunch (provided)**

13:00 - 13:15 **Chromozomes: Image Segmentation & Classification** by K. Pijacková (ISI of the CAS - CNS, CZ)

13:15 - 13:30 **Identifying Female Birds Using the Appearance of Their Eggs and Deep-learning** by M. Sulc (IVB of the CAS, Brno, CZ)

13:30 - 13:50 **DeFMO: Deblurring and Shape Recovery of Fast Moving Objects** by D.Rozumnyi (ETH Zurich, CH)

13:50 - 14:00 **Coffee break**

14:00 - 14:20 **3D Reconstruction of Motion-blurred Objects**
by D. Rozumnyi (ETH Zurich, CH)

14:20 - 14:40 **Image Analysis of the Steel** by P. Jozefovic (ISI of the CAS, Brno, CZ)

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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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