Deep'ILIA UMONS

THE X EDGE AI WORKSHOP

Hands on XAI and Edge AI

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Description.

In recent years, Deep Neural Networks (DNNs) have become increasingly important across various research domains and applications, including image processing, action recognition, text classification, language processing, and speech recognition. However, several challenges hinder their deployment in real-world environments, where efficiency, explainability, and data requirements are critical. The main limitations include:

- **High resource consumption:** DNN models require significant computational power, memory, storage, and energy, making them less suitable for embedded and Edge AI systems.

- **Lack of explainability:** DNNs are often seen as "black boxes," making their validation and interpretation difficult.

- **Strong dependence on large datasets:** training AI and DNN models typically requires vast amounts of labeled, multimodal data, posing challenges in data collection and processing.

Objective.

This workshop aims to explore innovative solutions to address these challenges in image classification and object detection. The three key areas of focus will be:

- **Embedded and Edge AI:** developing methods to compress and optimize deep learning models while maintaining high accuracy.

- **Explainable AI (XAI):** Investigating techniques that enhance the interpretability of AI models, enabling users to understand and trust their decisions

Main Steps.

Participants will engage in the development and deployment of DNN models on Edge AI platforms through the following steps:

1. Model development: train a CNN and/or ViT model for image classification or object detection.

2. Explainability analysis: identifying key parameters influencing the model's decisions.

3. Compression and optimization: apply techniques such as pruning, quantization, and knowledge distillation to create lightweight models.

4. Explainability assessment after compression: evaluate the impact of model compression on explainability.

5. Deployment on Edge AI devices: analyze computation time, memory and energy consumption.

Result.

The workshop offers a unique opportunity to explore advanced deep learning techniques addressing real-world deployment challenges. With this workshop, participants could provide accurate, explainable and embedded DNN models for images classification and object detection.

Proposed Workshop Technical Program Committee.

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