## Special Session

### Code: 77tw1

### Title

**Learning from streaming data - advances and challenges**

### Proposer / Main Organizer

- prof. Ing. *Jan Platoš*, Ph.D.

Faculty of Electrical Engineering and Computer Science, VSB - Technical University of Ostrava, Czechia

*Short biography:*

prof. Ing. *Jan Platoš*, Ph.D. is the current dean of the Faculty of Electrical Engineering and Computer Science, VSB - Technical University of Ostrava, and a professor at the Department of Computer Science in the same faculty. He has co-authored more than 230 scientific articles published in proceedings and journals. His citation report consists of 577 citations and H-index of 11 on the Web of Science, 1041 citations and H-index of 15 on Scopus, and 1588 citations and H-index of 19 on Google Scholar. His primary fields of interest are machine learning, artificial intelligence, industrial data processing, text processing, data compression, bioinspired algorithms, information retrieval, data mining, data structures, and data prediction.

### Co-organizers

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## IEEE Member or SMC Society Member
*Jan Platoš (IEEE SM member, IEEE SMC member)*
*Michał Woźniak (IEEE SM member, IEEE SMC member)*

This Special Session is endorsed by IEEE SMC TC on Big Data Computing
(https://www.ieeesmc.org/technical-activities/cybernetics/big-data-computing)

## Category
*Cybernetics*

## Number of Expected Paper Submissions
*Six or more*

## Keywords
Neural Networks and their applications; Representation Learning; Transfer Learning; Machine Learning; Application of Artificial Intelligence; Expert and Knowledge-Based Systems; Image Processing and Pattern Recognition

## Brief description and justification:

Data stream mining and continual learning are considered as one of the most important topics in the contemporary machine learning. Modern data sources generate high dimensional information with heterogenous structure, often plagued by noise, as well as incomplete and redundant information.  When designing learning systems for such data, one must consider both volume and velocity. A plethora of real-world applications, such as networking, finance, environmental engineering, or medicine, is displaying increasingly ubiquitous nature, making extraction of useful information a real challenge.

These challenges have motivated the development of dedicated machine learning algorithms for streaming data. Despite tremendous developments over the last decade, novel challenges in this field emerge regularly, requiring development of new mechanisms for managing learning and forgetting of concepts over time. The aim of this Special Session is to gather recent advancements on tackling fundamental questions in data stream mining and continual learning, such as adaptation to non-stationary characteristics, avoiding catastrophic forgetting, and learning under limited access to ground truth. We aim to provide a forum to share the latest innovative algorithms, and applications on streaming learning systems.

Specifically, this session will focus on the following hot topics on the field:

- concept drift detection and adaptation,
- continual and lifelong learning,
- avoiding catastrophic forgetting,
- memory formation and information selection,
- adaptive models and dynamic neural architecture search,
- streaming ensemble models,
- limited access to ground truth
- zero-shot and few-shot learning,
- online learning,
- active and semi-supervised learning,
- data augmentation,
- learning from multimodal data,
- meta-learning,
- benchmarking,
- industrial practical application.