

Essence Workshop, Umeå 2025

Workshop on Advancements in Federated Machine Learning

Introduction

Federated machine learning (FL) has emerged as a unique approach for privacy-preserving data analysis, enabling machine learning in scenarios where centralizing data is impractical. By allowing participants to work locally on their private datasets and contribute to a joint federated global model, FL offers the potential to train models while simultaneously complying with legislation such as the GDPR. It empowers advanced machine learning even with private, sensitive, or hard-to-move data, thereby marking a paradigm shift in the field.

Objective

In Sweden, several active research groups are investigating different facets of federated learning, ranging from scalability and management to security and privacy. National initiatives such as AI-Sweden are also actively engaged in this domain. The objective of this workshop is to establish a collaborative platform for Swedish researchers to share their expertise and foster cooperation on mutually interesting ideas related to FL. By facilitating engaging discussions and promoting cooperation among researchers, the workshop aims to drive advancements in federated machine learning.

Note: The FL Satellite workshop will be held in conjunction with the main Swedish e-Science Academy 2025. To register for the full Essence Event, please follow this link: <https://www.essenceofescience.se/w/es/en/calendar/archive/2025-10-15-swedish-e-science-academy-2025>

Organizing Committee

[Assoc. Prof. Salman Toor](#), Uppsala University (Research area: Distributed Infrastructures and Federated Machine Learning)

Dr. Johan Östman, AI Sweden (Research area - Decentralized AI)

Date and Time: *October 16, 13:00 - 16:00*

Agenda

Duration: Half-day workshop

Welcome to the Federated Learning Workshop

Duration: 13:00 - 13:15

Presentation-1: Distributed Continual Learning in High-Dimensional Regression

Speaker: [Assoc. Prof. Ayca Ozcelikkale](#), Uppsala University

Time: 13:15 - 13:40

Presentation -2: Fairness Regularization in Federated Learning: Connections, New Methods, and Empirical Insights

Speaker: [Dr. Zahra Kharaghani](#), Umeå University

Time: 13:45 - 14:10

Coffee break (30 minutes)

Presentation -3: Federated Learning for Industrial Use Cases

Speaker: [Dr. Sima Sinaei](#), RISE Research Institutes of Sweden

Time: 14:45 - 15:10

Presentation -4: Federated Machine Learning: Opportunities and Cybersecurity Challenges

Speaker: Assoc. Prof. Salman Toor, Uppsala University

Time: 15:15 - 15:40

Open Discussion Session

Convener: [Assoc. Prof. José Mairton Barros da Silva Júnior](#)

Time: 15:40 - 16:00