


Seminar: **Selected Topics in Machine Learning Research**

Information Event

Summer Term 2024

Data Analytics and
Machine Learning 

Team

- **Prof. Dr. Stephan Günnemann**
- *Johanna Sommer*, Jan Schuchardt, Filippo Guerranti, Aleksei Kuvshinov, Marten Lienen, Anna Kopetzki

This is a seminar for **Master** students!
Main prerequisite: Machine Learning (IN2064)

Website with all information:

<https://www.cs.cit.tum.de/daml/lehre/sommersemester-2024/seminar-selected-topics-in-machine-learning-research/>

Preliminary List of Topics

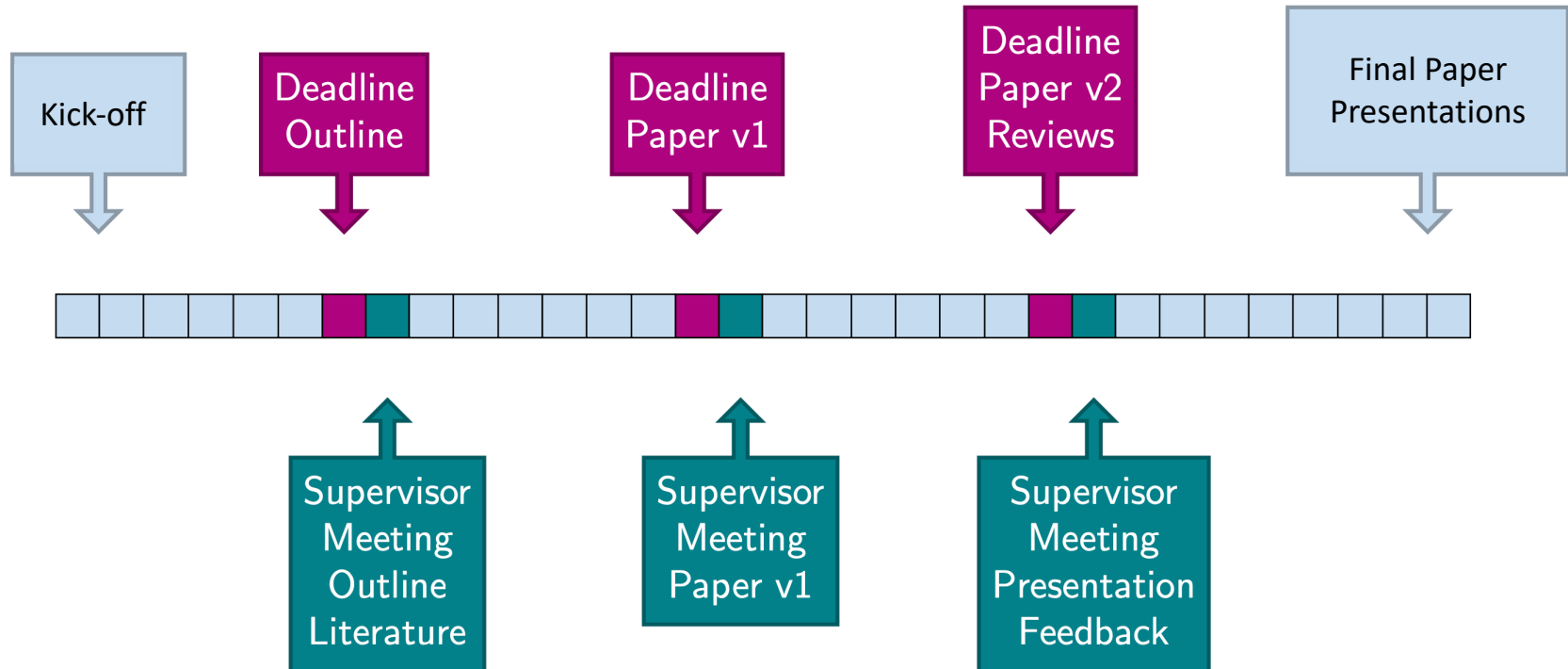
- Generative models: diffusion / flow matching
- Stochastic differential equations
- Structured state space models
- Hierarchical attention
- Uncertainty on time series
- Spatio-temporal graph learning
- Spectral graph neural networks
- Differentially private machine learning
- Lipschitz GNNs for robust learning on graphs

What will you do?

1. Read **seed research papers** (provided by us)
2. Start your **snowball research** from there (references from / to these papers, relevant keywords)
3. Summarize your findings, criticism and research ideas in a **short paper** (4 pages, double column)
4. Write **reviews** for other students work
5. **Present** your work in 25-minute talks

Grades will be based on **all parts**: paper, reviews, talk & overall participation.

Schedule



Why attend this Seminar?

1. Learn about and explore **state-of-the-art** research in ML
2. **Analyze and criticize** recent publications
3. Improve your **scientific writing**
4. Participate in a **review process** akin to international conferences
5. Improve your **presentation skills**

Requirements

- Strong knowledge of machine learning and mathematics
- Passed relevant courses (the more, the better)
 - Machine Learning (hard requirement)
 - Machine Learning for Graphs and Sequential Data
 - Deep Generative Models
 - Machine Learning Lab Course
- Motivation
- Additional selection criteria: in the application form, there will be a text field for relevant experience (projects in companies, experience as a HiWi, ...)

Registration

Registration via the matching system!

<https://matching.in.tum.de>

+ Fill out the application form!

<https://forms.gle/qRBJmm6iZbnAzvk59>

Deadline: February 14th, 2024