

Selected Topics in Machine Learning Research (Seminar)

Preliminary Meeting

Lecturer: Prof. Dr. Stephan Günnemann

Summer Term 2020

Team

- Prof. Dr. Stephan Günnemann
- Johannes Klicpera, Anna Kopetzki, Aleksei Kuvshinov, Marin Bilos

This is a seminar for **Master** students!

Main prerequisite: Machine Learning (IN2064)

Website:

<https://www.daml.in.tum.de/en/teaching/summer-term-2020/seminar/>

Why attend this Seminar?

1. Learn about and explore **state-of-the-art research** in machine learning
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**

Topics I: Modern architectures

- Node embeddings
- Graph neural networks
- Optimal transport for machine learning
- Normalizing flows
- Transformers

Topics II: Properties of ML models

- Expressive power of graph neural networks
- Equivariance in neural networks
- Transfer learning
- Explainability
- Adversarial attacks
- Robustness

Requirements

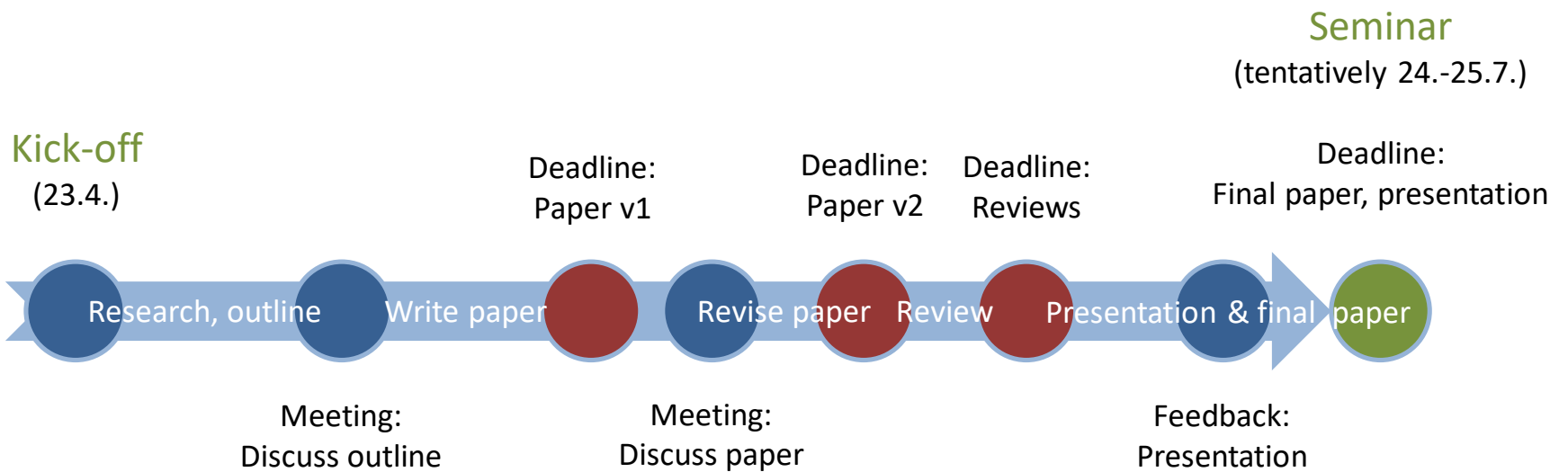
- Strong knowledge of machine learning and mathematics
- Passed relevant courses (the more, the better)
 - Machine Learning (hard requirement)
 - Machine Learning for Graphs and Sequential Data (formerly Mining Massive Datasets)
 - Machine Learning Lab
- Motivation
- Additional selection criteria
 - other **relevant** experience (projects in companies, experience as a HiWi)
 - you can send an overview of your experience to us ([see end of slides](#))

Tasks

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

Grade will be based on **all** parts: Paper, reviews, talk and overall participation

Schedule



Registration via the matching system!

Selected Topics in Machine Learning Research
(IN2107, IN4872)

+ Fill out the application form!

<https://forms.gle/2DRAF5CAvxyDxhgH8>

- provide us with your list of experience in ML (courses, projects, etc.)
- please send us a **concise** overview (bullet list, not a complete CV)