Machine Learning Lab Course
Preliminary Meeting (IN2106, IN4192)

Lecturer: Prof. Dr. Stephan Günnemann

Summer Term 2023

Team

- Prof. Dr. Stephan Günnemann

- Filippo Guerranti, Bertrand Charpentier, Simon Geisler

This is a practical course (Praktikum) for **Master** students!
Name of module: Large-Scale Machine Learning (IN2106, IN4192)

Website: www.cs.cit.tum.de/daml/lehre/sommersemester-2023/large-scale-machine-learning/

Data Analytics
and Machine Learning

Why attend our ML lab course?

1. Opportunity to **implement and apply** state-of-the-art ML algorithms

2. Gain **hands-on experience** working on **real-world data**, solving **real-world tasks** by working on projects offered by our **industry partners** as well as **academic projects**

3. Work on **large-scale problems** with the support of our **GPU computing resources**

Requirements

- Requirements for the lab course

  - **Advanced programming skills**: Python, PyTorch, etc.

  - Strong foundations in data mining/machine learning

  - You should have passed relevant courses (the more, the better)
    $\rightarrow$ Machine Learning,
    $\rightarrow$ Machine Learning for Graphs and Sequential Data,
    $\rightarrow$ . . .
    $\rightarrow$ see the application form

  - 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)

Organization – Structure

- Groups of 3 students

- This term we offer 4 different projects

- Students get access to our GPU servers, each with (or better)
  - 4x NVIDIA GPU with 11GB RAM
  - 10-core CPU
  - 256 GB RAM
    - $\rightarrow$ Scale up your models and data!

Organization – Course

- Bi-weekly course meetings (around 2 hours)
  - in person
  - Wednesdays 10-12 am
  - All groups present their work
  - Each group should briefly report their progress and next steps

- Bi-weekly group meetings
  - with advisor and industry partner
  - analyze results, plan next steps

- Regular documentation of your work on wiki

- Code on git (gitlab.lrz.de)

Data Analytics
and Machine Learning

TUM-DAML

Green and Efficient Machine Learning

Non-traditional Graph Laplacians

Adversarial Robustness of Graph Contrastive Learning methods

Energy4U

Representation Learning and Anomaly Detection on Heterogenous Graphs

Project Presentations WS22/23

- Learn about current projects
- Short presentations and poster discussions
- Discuss with current students

Thursday, Februrary 9th, 10am in 00.13.054

- Uncertainty estimation for autonomous driving
- Anomaly detection in financial data
- Time series forecasting for load prediction
- Link building for page-rank optimization

in cooperation with

Registration via the matching system!
`https://matching.in.tum.de`

Large-Scale Machine Learning (IN2106, IN4192)

+ Fill out the application form!
`https://forms.gle/ixqtcQxSpQ9An8mM6`

Deadline 15.02.2023

- Which lab / seminar are you applying for?
- List of ML-related lectures you have attended
- A **concise** overview of your resume (bullet list, not a complete CV)
- A brief motivational statement
- Any additional relevant experience (research, HiWi positions etc.)