

# Preliminary Meeting of the NLP Lab Course WS 2025/26

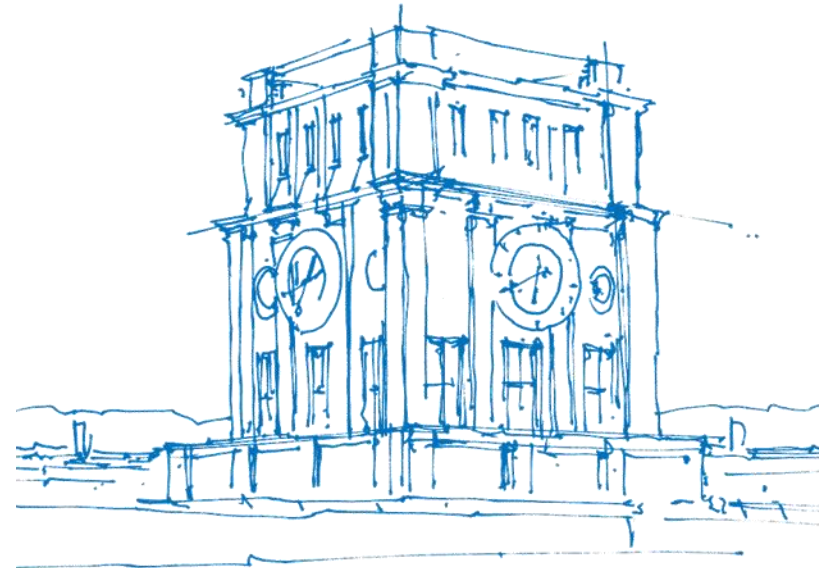
Master Lab Course - Machine Learning for Natural Language Processing Applications (IN2106, IN4249)

Miriam Anschütz, Frederic Mrozinski,  
and many more

Prof. Dr. Georg Groh

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03.02.2026



*TUM Uhrenturm*

# Outline

1. Requirements
2. Registration
3. Procedure
4. Project examples
  - Text simplification and summarization
  - Evaluating correctness of generated text
  - Biomedical knowledge enhancement
  - Pattern detection for cancer tissue
  - Green and efficient AI
  - User Knowledge and Need Alignment in LLMs

# Requirements

## Minimum:

- Master student in computer science, data engineering, or "alike"
- Good enough English skills
- Basic programming and machine learning knowledge

## Important:

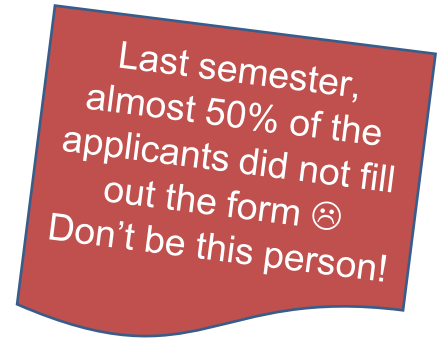
- Hands-on experience in Python, especially Pandas and Numpy
- Basic knowledge about artificial neural networks
- Basic knowledge about natural language processing

## Optimal:

- Practical experience with Deep Learning frameworks, such as PyTorch, Tensorflow, Huggingface, etc.

# Registration

- Until **17 February**, fill out the [registration form](#)



- Your entries are considered when ranking the interested students for the course.
- From **12 to 17 February**, you also have to register for the course on the [matching system](#).
- End of **February**, you will (probably) be notified by the matching system about the status of your participation.
- We will get in touch with you in March for the following steps.

# Procedure

## Project teams:

- You are going to work in teams of 2 or 3 people on one project topic.
- You can choose with whom to work with the project topic.
- Every project member has to report and work equally (no dirty business!).

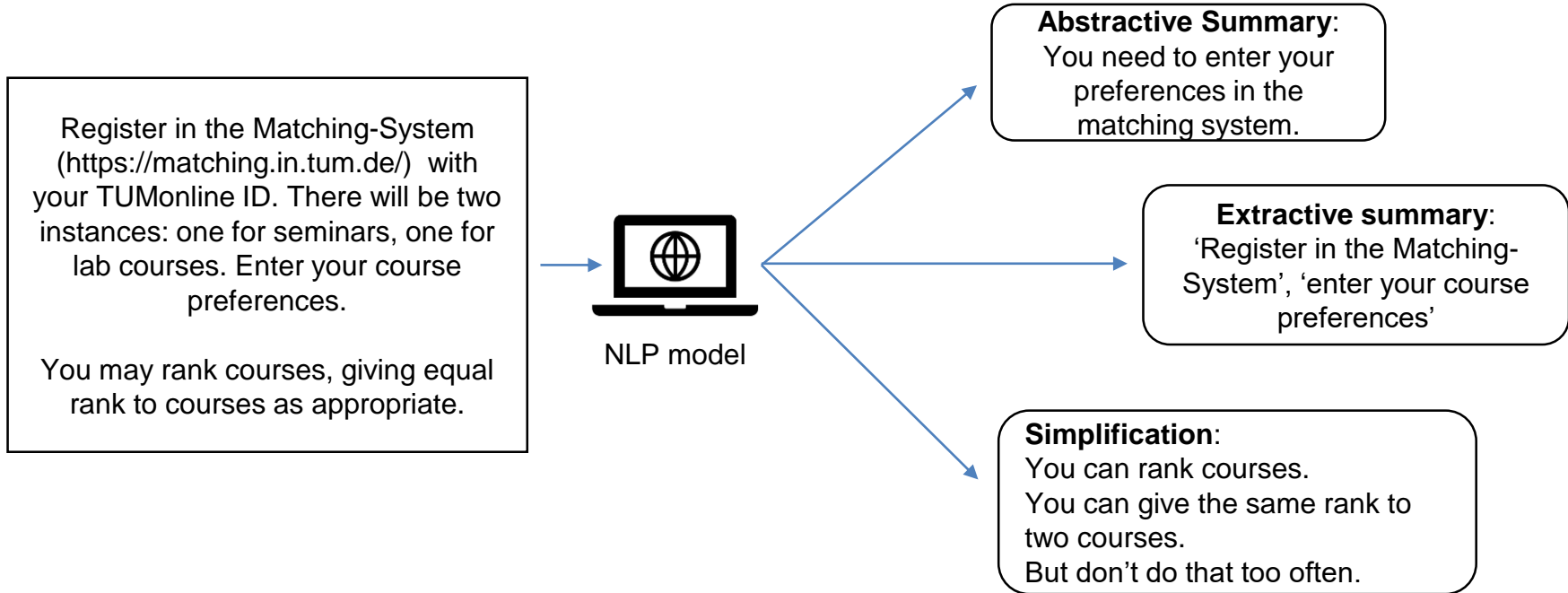
## Procedure:

- There will be one kickoff meeting at the beginning of the semester.
- There are going to be bi-weekly consulting and progress report sessions.
- You have to be part of a poster session and hand in a report at the end of the semester.

Everything else will be announced at the beginning of the semester.

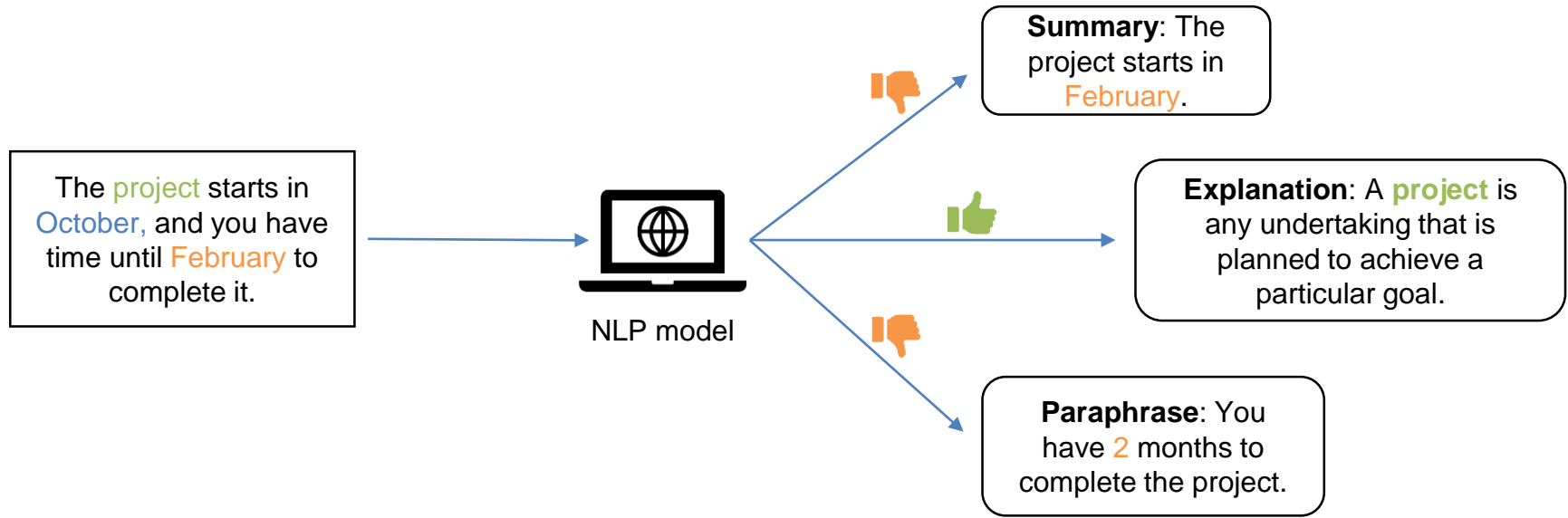
# Projects – Text summarization and simplification

Miriam Anschütz, M.Sc.;



# Projects – Evaluating correctness of generated text

Miriam Anschütz, M.Sc.



# Projects – Biomedical Knowledge Enhancement of LMs

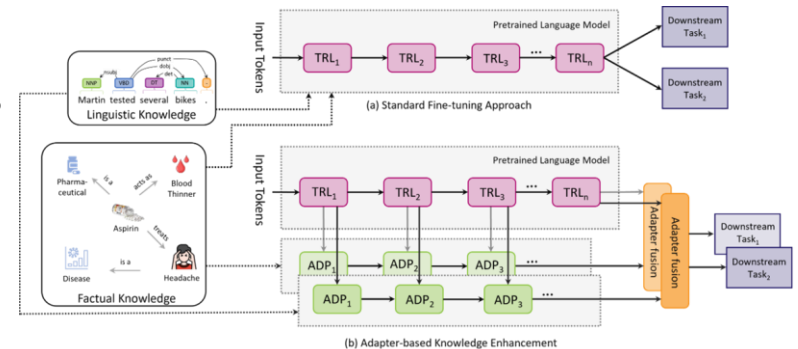
Alexander Fichtl, M.Sc.

- 60% of medical doctors in Germany spend 3 hours or more per day on documentation and administrative tasks
  - Many tasks in bio-medicine can be supported by LMs
  - Domain specific LMs profit from explicit knowledge injection
- You will be using biomedical knowledge graphs to enhance domain specific LMs that can potentially address these issues



## BLURB

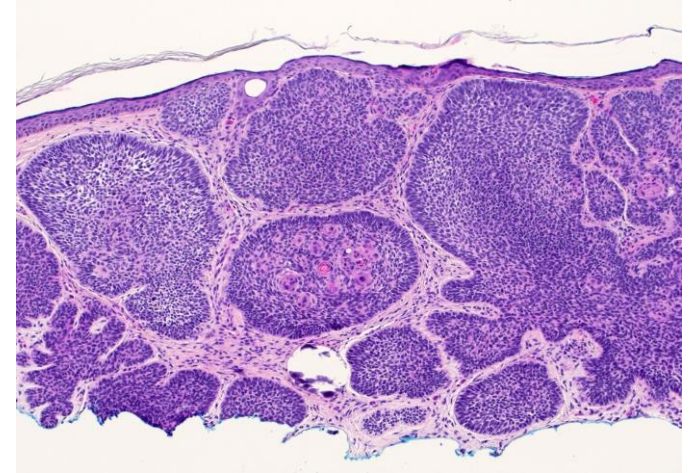
Biomedical Language Understanding and Reasoning Benchmark



# Projects – Few-Shot Pattern Detection for Cancer Tissue

Frederic Mrozinski, M.Sc.

- Medical data is expensive and not publicly available for every disease
- => Can we break down pattern recognition of diseases into more simple subtasks?
- Can we use few-shot capabilities of models like CLIP?





# Projects – User Knowledge and Need Alignment in LLMs



Lukas Ellinger, M.Sc.

## Motivation:

- When people talk, they track what is in the others mind (their knowledge, perceptions and thoughts)
- Users ask explicit questions, but often have deeper, unspoken goals

## Topics:

### **Need Inference:**

Can the model uncover unspoken needs behind a question?  
-> Reveal and support latent goals.

### **Epistemic Alignment:**

How do LLMs model what users know, believe and expect?  
-> Maintain shared understanding throughout the conversation.

### **Answering Strategies:**

When should an LLM answer, abstain, or clarify?  
-> Match response strategy to ambiguity and user intent.



# Questions?

Registration form:

