Applied Deep Learning in Medicine

Who we are

- Institute for AI in Medicine (http://aim-lab.io/)
- Part of Departments of Informatics and Medicine
- Offices at MRI (TranslaTUM) and Garching
- Developing methods for the intersection of AI and medicine
- Close collaboration with medical experts

What the practical is about

- Most uni projects are on toy data
- This does not represent real world in several aspects:
  - Messy/unprocessed data
  - Storage/Computing requirements
- Our goal is to train you to work on real-world data
  - How to preprocess data?
  - How to structure a project?
  - How to communicate with stakeholders?
- Two birds, one stone
  - You get real world experience
  - Also you will have excellent prerequisites for consecutive projects

How will this look like

- 24 students, 3 persons per team -> 8 teams
- Two supervisors for two groups
- Teams are assigned to tasks on a medical dataset
- Weekly informal updates
- Consultation with medical experts possible
- Computational resources are available (to some degree)

How will it be evaluated

- Grades are based on
  - 3 presentations during the semester
    - especially your problem solving skills
    - your interaction with other teams
  - your code
  - final presentation
  - project report
- Grades within teams can differ
- Individual grades will be team grade adapted by contribution

Current projects

Supervisor	Project Title
Wenqi	Generalized Implicit Neural Representations for Magnetic Resonance Imaging
Jojo	Rotation invariant inherently interpretable machine learning
Robert	Remove your one deformation (Image Registration)
Sarah	Inherently interpretable deep learning models for medical imaging
Johannes	Time-to-Diagnosis: Predictive Modeling in Lung Cancer Screening
Dima	Analyzing Fusion Strategies for MRI Sequences and Tabular Data on Metastatic Brains
Matan	Back to the Feature
Hendrik	Analysis of Resolution Differences on a Segmentation Task

What we expect

- You don't need to be an expert
- You should have done related courses and have a background in machine learning
- To assess your knowledge we provide a google form which tells us about your background
- All data entered will be only used for the purpose of the practical and deleted right after
- Based on your answers we will prioritize for the matching
- People who are accepted to the practical need to be able to prove the listed courses and grades
- Questions?
  - https://forms.gle/knHh6rThmfzMWnwi6