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 is it about?

- Most uni projects are on toy data
- This does not represent real world in several aspects:
  - Messy/unprocessed data
  - Storage/Computing requirements
  - Data protection issues
- Our goal is to train students to work on real 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 meetings
- Consultation with medical experts possible
- Computational resources are available (to some degree)

How will it be evaluated

- Grades will be determined by your
  - 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

Last projects

Supervisor	Project Title
Wenqi	Learning Neural Implicit Representations of MRI Data
Jojo	Reconstructing Genetic Information from Trained Cancer Predictors
Robert	Image Registration
Flo	Non-invasive and accurate prediction of prostate cancer aggressiveness
Johannes	Lung Cancer Risk Prediction Using Multimodal Deep Learning
Daniel	Analyzing Fusion Strategies for MRI Sequences and Tabular Data on Metastatic Brains
Can	Risk Stratification for Brain Metastasis Recurrence Using Attention CNNs on MRIs
Hendrik	Finding the best combination of Image- and Segmentation-based techniques for reliable CT vertebrae labeling in incomplete scans

Matching

- We do not expect you to be experts
- We do expect that you have done related courses and have a background in machine learning
- To assess your knowledge we provide a voluntary option to fill in 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/L7yRcihyrJUBAfvj8