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
- (Bi)Weekly progress meetings
- Consultation with medical experts possible
- Computational resources are available

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
- Grades within teams can differ
- Individual grades will be team grade adapted by contribution

Current projects

Supervisor	Project Title
Özgün	Brain age prediction using electroencephalography (EEG) based on self-supervised learning.
Philip	Deep Learning on clinical times series data from ICU stays
Paul	Extraction of morphometric tabular features for subsequent boosting of multimodal self-supervised contrastive learning
Alex	How to gradually unfreeze models for transfer learning?
Can / Daniel	Ablating the number of necessary MRI sequences for glioma classification
Robert	Upscaling segmentations with shape priors
Hendrik	Supervised Castellvi class prediction
Vasiliki	Contrast invariant registration via random convolutions

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 will need to submit proofs for their answers (transcripts, etc)
- Questions?
    - https://forms.gle/NkyUtHkudApnXxpe9