ML-Neuro Seminar WS22/23: Kickoff

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Lab for Artificial Intelligence in Medical Imaging

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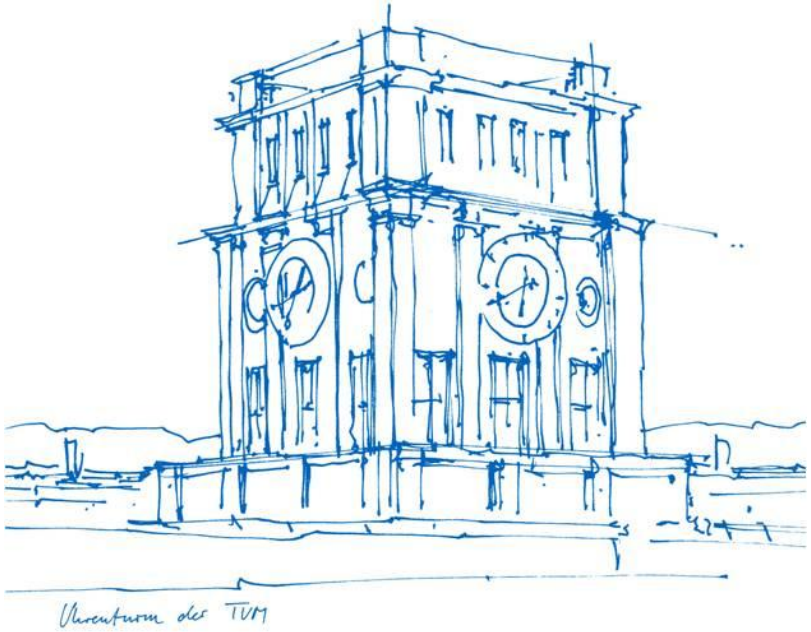
24 October 2022



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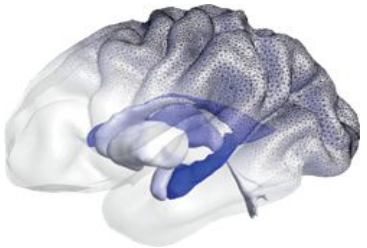
ai-med.de

github.com/ai-med



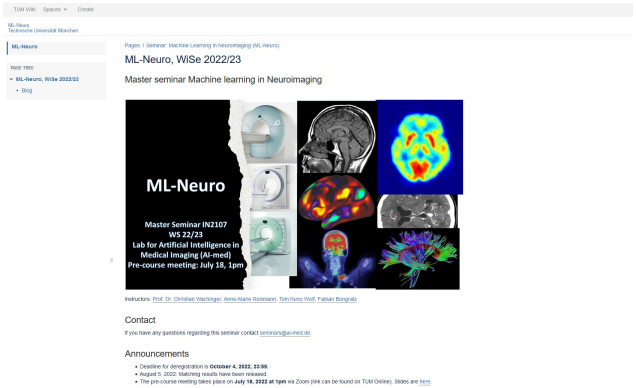
Agenda

- Introduction of supervisors
- Platforms: wiki and moodle
- Timeline
- Expectations
- Distribution of papers
- Q & A

Platforms

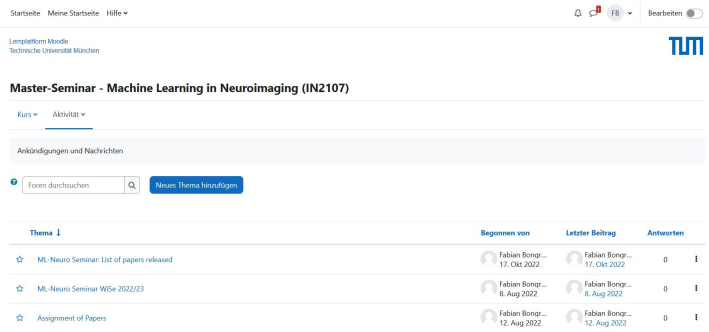
Wiki

- https://wiki.tum.de/display/mlneuro
- General information about the seminar
- Blogs, presentations
- Additional material



Moodle

- Platform for communication
- Questions & Discussions



Timeline


Kickoff
Work phase
Block Seminar
24 October 22
9/10 January 23

Timeline

- General introduction
- Distribution of topics

Timeline

- Individual work on the assigned topic / paper
- Meeting with supervisor
  - Before Christmas
  - Discussion of current state, e.g., preliminary headlines, subsections, core messages

Timeline

- Presentations (planned in-person)
- Upload blog post

Expectations

- Being able to read a paper in a structured way
- Explanation of complex ideas in an understandable blog post
- Presentation of research findings to a technical audience

What to deliver?

- Paper presentation

  50% of final grade

- Blog post

  50% of final grade

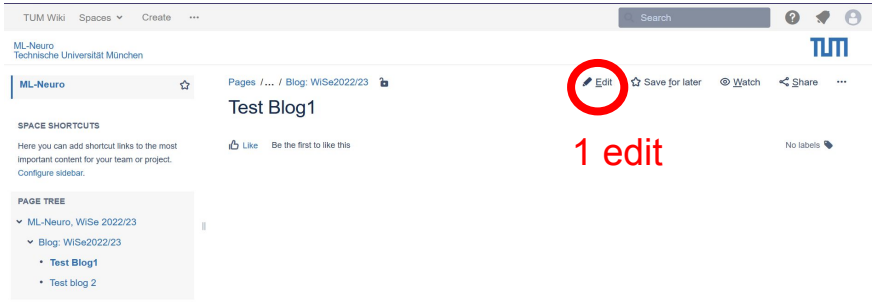
Paper presentation

- 20 min. presentation, 10 min. discussion (will influence grade)
- Rule of thumb: 1–2 minutes per slide → 10–20 slides
- Planned to be in-person
- Talks are held in English
- Technical audience: use appropriate language
- Upload slides to the wiki before 9 January 2022 (block seminar)
- Recommended structure:
  - Introduction
  - Overview / Outline
  - Method description
  - Experiments and results
  - Discussion: Strengths and Weaknesses
  - Summary

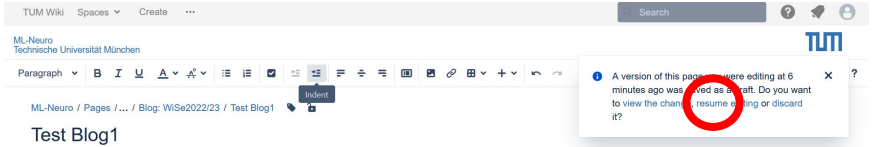
Blog post

- Written and posted in the wiki
- 1500 - 2000 words
- Mostly non-technical language
- English
- Figures: primarily self-made!
- Deadline: 29 January 2022 (two weeks after presentations)
- Content: motivation, contributions, methodology, core results, discussion, **your own comments/review**

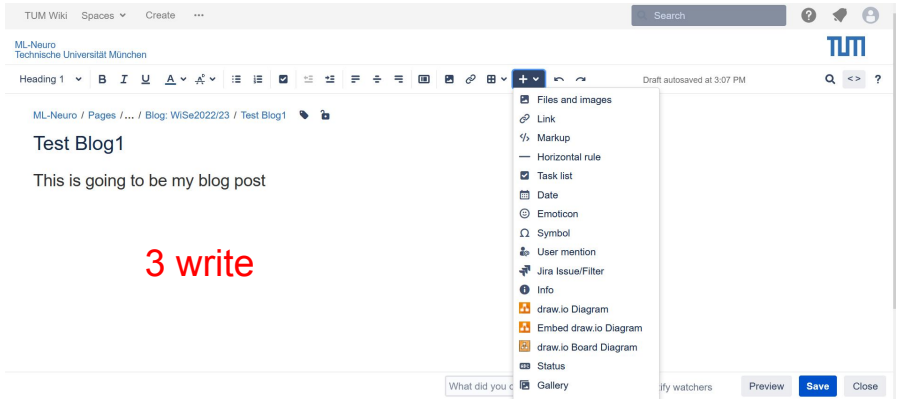
Writing the blog post



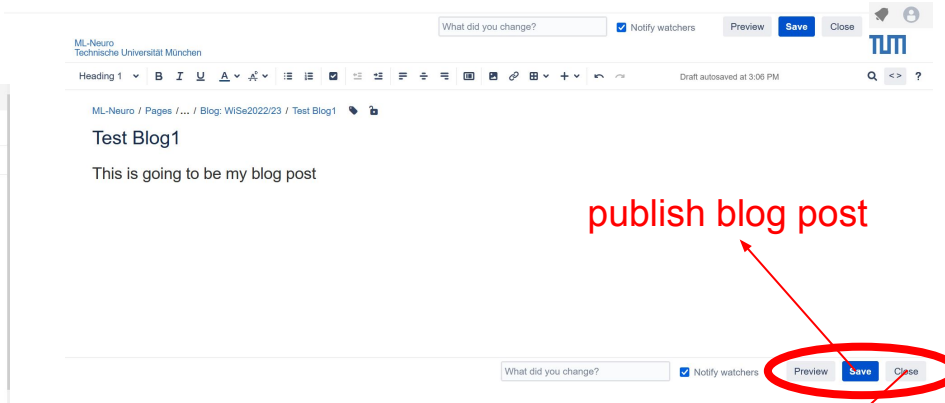
1 edit



2 potentially resume



3 write



publish blog post

4

draft is saved but can be easily overridden, be careful!!!

Paper assignment

Topics

Paper ID	Title	Published in	Link	Additional material	Supervisor	Student
1	Single Subject Prediction of Brain Disorders in Neuroimaging: Promises and Pitfalls	NeuroImage	https://www.sciencedirect.com/science/article/abs/pii/S105381191600210X		Christian Wachinger	Andres Zapata
2	Building better biomarkers: brain models in translational neuroimaging	Nature Neuroscience	https://www.nature.com/articles/nn.4478		Christian Wachinger	Ding Zhou
3	Uncovering the heterogeneity and temporal complexity of neurodegenerative diseases with Subtype and Stage Inference (SuStain)	Nature Communications	https://www.nature.com/articles/s41467-018-05892-0#MOESM1	https://www.youtube.com/watch?v=-ZCqEqlnabQ https://github.com/ElsevierSoftwareX/SOFTX-D-21-00098/blob/master/notebooks/SuStain%20tutorial%20using%20simulated%20data.ipynb	Christian Wachinger	Lisa Schmierer
4	Conditional VAEs for Confound Removal and Normative Modelling of Neurodegenerative Disease	MICCAI 2022	https://link.springer.com/chapter/10.1007/978-3-031-16431-6_41	https://github.com/alawryaguila/normativecVAE	Nuno Wolf	Elias Wohlgemuth
5	Disentangling Normal Aging from Severity of Disease via Weak Supervision on Longitudinal MRI	IEEE TMI	https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9754514&tag=1	https://github.com/ouyangjiahong/longitudinal-direction-disentangle	Nuno Wolf	Tabea Lüdde
6	Deep learning-based unlearning of dataset bias for MRI harmonisation and confound removal	NeuroImage	https://www.sciencedirect.com/science/article/pii/S1053811920311745	https://github.com/nkdinsdale/Unlearning_for_MRI_harmonisation	Nuno Wolf	Efe Berk Ergüleç
7	Are 2.5D approaches superior to 3D deep networks in whole brain segmentation?	MIDL 2022	https://openreview.net/forum?id=Ob62JPB_CDF	https://github.com/Deep-MI/3d-neuro-seg	Fabian Bongratz	Shi Que
8	Robust, Primitive, and Unsupervised Quality Estimation for Segmentation Ensembles	Frontiers in Neuroscience	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8757043/pdf/fnins-15-752780.pdf		Fabian Bongratz	Defne Demirtürk
9	Analyzing the Quality and Challenges of Uncertainty Estimations for Brain Tumor Segmentation	Frontiers in Neuroscience	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7156850/pdf/fnins-14-00282.pdf		Fabian Bongratz	Robin Falter
10	Goal-specific brain MRI harmonization	NeuroImage	https://www.sciencedirect.com/science/article/pii/S1053811922006851		Anne-Marie Rickmann	
11	Surface Vision Transformers: Attention-Based Modelling applied to Cortical Analysis	MIDL 2022	https://openreview.net/pdf?id=mpp843Bsf-	https://2022.midl.io/papers/b3	Anne-Marie Rickmann	Nian Li
12	Spherical U-Net on Cortical Surfaces: Methods and Applications	IPMI 2019	https://link.springer.com/chapter/10.1007/978-3-030-20351-1_67	https://github.com/zhaofenqiang/Spherical_U-Net	Anne-Marie Rickmann	Milena Eisemann

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Questions?