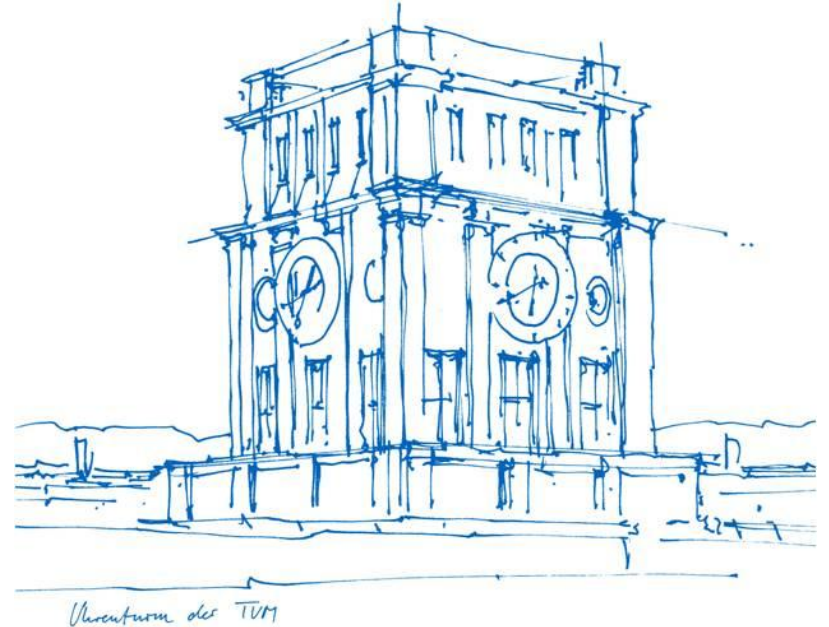


ML-Neuro Seminar WS22/23: Kickoff

Anne-Marie Rickmann, Nuno Wolf,
Fabian Bongratz, Prof. Dr. Christian Wachinger

Lab for Artificial Intelligence in Medical Imaging
Department of Radiology / Faculty of Informatics
Technical University of Munich

24 October 2022





Prof. Dr. Christian Wachinger



Nuno Wolf



Anne-Marie Rickmann



Fabian Bongratz

Lab for Artificial Intelligence in Medical Imaging

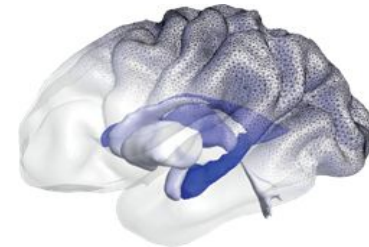
@TUM Informatics

@Klinikum rechts der Isar, Department of Radiology

@LMU Department of Child and Adolescent Psychiatry

ai-med.de

github.com/ai-med



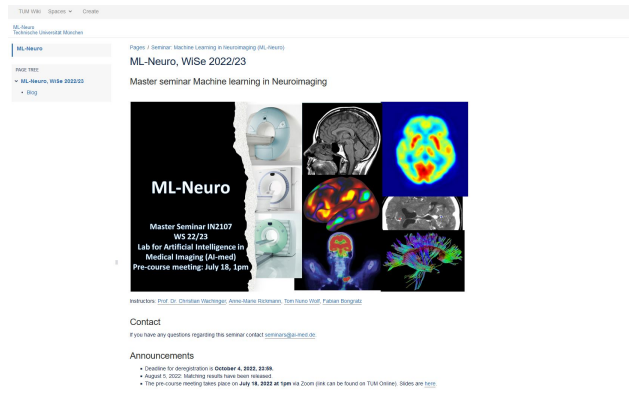
Agenda

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

Platforms

Wiki

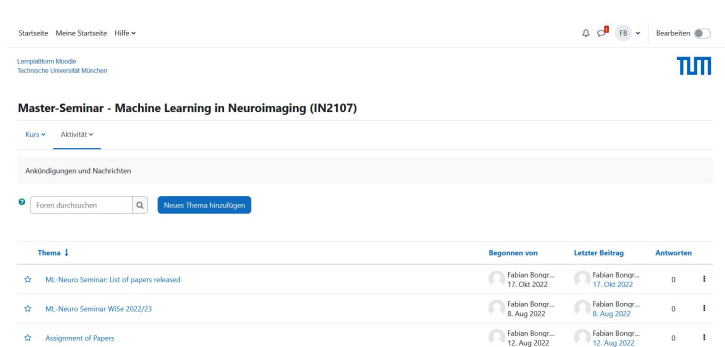
- <https://wiki.tum.de/display/mlneuro>
- General information about the seminar
- Blogs, presentations
- Additional material



The screenshot shows the Wiki page for 'ML-Neuro, WiSe 2022/23'. The page title is 'Master seminar Machine learning in Neuroimaging'. Below the title is a large image collage featuring brain scans, a brain model, and a colorful heatmap. The text on the image reads 'ML-Neuro Master Seminar IN2107 WS 22/23 Lab for Artificial Intelligence in Medical Imaging (AI-med) Pre-course meeting: July 13, 1pm'. Below the image, there is a 'Contact' section with an email address and an 'Announcements' section with several bullet points regarding the seminar schedule and pre-course meeting.

Moodle

- Platform for communication
- Questions & Discussions



The screenshot shows the Moodle course page for 'Master-Seminar - Machine Learning in Neuroimaging (IN2107)'. The page includes a search bar for forums, a 'Neues Thema hinzufügen' button, and a table of course activities. The table has columns for 'Thema', 'Begonnen von', 'Letzter Beitrag', and 'Antworten'.

Thema	Begonnen von	Letzter Beitrag	Antworten
☆ ML-Neuro Seminar: List of papers released	Fabian Bongr... 17. Okt 2022	Fabian Bongr... 17. Okt 2022	0 1
☆ ML-Neuro Seminar WiSe 2022/23	Fabian Bongr... 8. Aug 2022	Fabian Bongr... 8. Aug 2022	0 1
☆ Assignment of Papers	Fabian Bongr... 12. Aug 2022	Fabian Bongr... 12. Aug 2022	0 1

Timeline



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



TUM Wiki Spaces Create ... Search

ML-Neuro Technische Universität München

Pages / ... / Blog: WiSe2022/23

Test Blog1

ML-Neuro **Edit** Save for later Watch Share ...

SPACE SHORTCUTS

Here you can add shortcut links to the most important content for your team or project. Configure sidebar.

PAGE TREE

- ML-Neuro, WiSe 2022/23
 - Blog: WiSe2022/23
 - Test Blog1**
 - Test blog 2

1 edit

TUM Wiki Spaces Create ... Search

ML-Neuro Technische Universität München

Paragraph B I U A ... Paragraph

ML-Neuro / Pages / ... / Blog: WiSe2022/23 / Test Blog1

Test Blog1

A version of this page was saved as a draft 6 minutes ago. Do you want to view the changes and resume editing or discard it?

Notify watchers Preview Save Close

2 potentially resume

TUM Wiki Spaces Create ... Search

ML-Neuro Technische Universität München

Heading 1 B I U A ... Draft autosaved at 3:07 PM

ML-Neuro / Pages / ... / Blog: WiSe2022/23 / Test Blog1

Test Blog1

This is going to be my blog post

- Files and images
- Link
- Markup
- Horizontal rule
- Task list
- Date
- Emoticon
- Symbol
- User mention
- Jira Issue/Filter
- Info
- draw.io Diagram
- Embed draw.io Diagram
- draw.io Board Diagram
- Status
- Gallery

Notify watchers Preview Save Close

3 write

ML-Neuro Technische Universität München

Heading 1 B I U A ... Draft autosaved at 3:06 PM

ML-Neuro / Pages / ... / Blog: WiSe2022/23 / Test Blog1

Test Blog1

This is going to be my blog post

Notify watchers Preview **Save** Close

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/mn.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/s41467-018-05692-0#MOESM1	https://www.youtube.com/watch?v=-ZCqEqInabQ 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/aiawryagulia/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/ouyangjihong/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/nkindsdale/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/zhaoferqiang/Spherical_U-Net	Anne-Marie Rickmann	Milena Eisemann

Questions?