



Chair for Computer Aided Medical Procedures (CAMP)
Master Seminar on
Deep Learning for Medical Applications

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Organizing Team

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Course Regulations

Basic Info about the course

- **Type:** Master Seminar (IN2107)
- **Language:** English
- **SWS:** 2
- **ECTS:** 5 Credits
- **Webpage:**
 - <https://collab.dvb.bayern/spaces/TUMdlma/pages/2877458001/DLMA+Winter+2026+27>
- **Time:**
 - Thursdays, 12:00-14:00
- **Location:**
 - Seminar Room (03-13-10)
- **Requirements:**
 - Background in Machine/Deep Learning.



Objective

- **Read, present, and discuss** many challenges present in Medical Applications of Deep learning:
 - Understanding and Interpreting Predictive Models, Safety of Predictive Models—> Interpretable DL, Explanation, Uncertainty, Robustness
 - Handling few amount of labeled data —> Transfer Learning, Semi-/Weakly- Supervised Learning, Meta-Learning, Augmentation, Active Learning, Learning under Noisy Labels
 - Handling class Imbalance —> Special loss functions
 - Handling Multi-Modal Data —> Graph Convolutional Networks
 - Handling Intra/Inter-Scanners Variability —> Domain Adaptation
 - Incorporating Prior Knowledge —> Shape Models/Geometric Constraints
 - Security of Predictive Models —> Adversarial examples
 - ...



Discussed Topics Examples

Date	Session: Topics	Slides	Students
15.06	Recent Trends in Medical Image Segmentation 3D vessel segmentation Structural Continuity in Segmentation		Huang, Pei-Ran Sauer, Bjarne Güvercin, Göktug
22.06	Exploring Latest Unsupervised Computer Vision Models for Segmentation Self-supervised Volume Segmentation Self-supervised graph representation learning		Klausen, Tobias Altunbas, Begüm Oytun Demirbilek
29.06	Image Superresolution Using Generative Models Sound and Music Generative Models Sensorless US compounding		Schauer, Robert Victor Dzhagatspanyan Sharma, Devansh
6.07	Application of Diffusion Models for Medical Imaging Image to image translation with diffusion models Sampling Methods in Diffusion Models		Cheng, JiaJian Trigui Amal Yeşilkaynak, Vahit Buğra
13.07	Converting weights of 2D Vision Transformer for 3D Image Classification Natural Language Explanations for Vision and Vision-Language tasks non-rigid 2d-3d registration Image Stitching Using Unsupervised/Semi-Supervised Learning		Ben Chaaben, Zeineb Marin Ruiz, Jorge Yang, Shucheng Güven Erkaya
20.07	Physics-inspired Neural Networks Counterfactual Modelling Confidence segmentation		Wagner, Jakob Pennig, Lars Yakal, Furkan



Conferences & Journals

- CVPR: Conference on Computer Vision and Pattern Recognition
- ICLR: International Conference on Learning Representations
- ICML: International Conference on Machine Learning
- NeurIPS: Neural Information Processing Systems
- ECCV/ICCV: European/International Conference on Computer Vision
- TMI: IEEE Transaction on Medical Imaging
- MedIA: Medical Image Analysis (Elsevier)
- TPAMI: IEEE Transactions on Pattern Analysis and Machine Intelligence
- Nature: world's leading multidisciplinary science journal
- MICCAI: Medical Image Computing and Computer Assisted Intervention
- BMVC: British Machine Vision Conference
- MIDL: Medical Imaging with Deep Learning



Logistics

- Presentation: Max. 25 Minutes
- Q&A: 5-10 Minutes
- Number of slides: Approximately >20
- Attendance is mandatory
- Blog post submission:
 - **ONE WEEK Before** the first session of presentation
 - Only minor modifications is allowed before the **Last session** of Presentations, based on the feedback given in the presentation



Evaluation Guideline

Presentation 45%

- 25 minutes + 5 to 10 minutes Q&A
- Slides (Powerpoint, Latex, see website for templates)
- They should cover all relevant aspects of the topic
 - Motivation/ Big picture
 - Methodology of the topic-related state-of-the-art papers
 - Experimental results
 - Discussion
 - Student's Review
- Self-contained (review of state of the art is necessary!)
- Presentation guidelines will be released later.
- **All students are expected to attend all presentations and interact during Q&A**
- **Examples from previous semester:**
- <https://collab.dvb.bayern/spaces/TUMdlma/pages/2374995088/DLMA+Summer+2026>



Evaluation Guideline

Blog Post (25%)

- Blog post explaining the main ideas of the paper.
 - Motivation + Contributions
 - Methodology
 - Results & Discussion
- 2500-3000 words topic summary + 300-500 words your own review
- Students will be requested to comment on each other's blog posts.
- The website where the posts will be uploaded is [1].
- You can later privately share your blog posts in other websites as well (eg Medium).
- Upload the first draft of blog post a few days before the first presentation session. There will be time to do some minor modification until the last presentation session.
- **Examples from previous semesters:**
<https://collab.dvb.bayern/spaces/TUMdlma/pages/1306500023/Blog+posts+Summer+2025>

Attendance (10%)



[1] <https://collab.dvb.bayern/spaces/TUMdlma/pages/2374995088/DLMA+Summer+2026>

Evaluation Guideline

Quiz (20%):

First FIVE minutes of each session, before the presentations

- **Presenter (10%)**
 - ONE WEEK BEFORE THE PRESENTATION
 - Must submit at least 5 questions from their blog posts to **dlma@camp.cit.tum.de**
 - Multiple choices
 - 1 out of 4
 - >1 out of >4
 - Oriented towards the methodology
 - Analysis
 - Preferably not oriented towards names
- **Attendees (10%)**
 - Read the blog posts
 - Answer the questions
 - around 2 questions from each of the current's day presentations



How can you apply?

- Submit the registration form (on course webpage)

DLMA Registration

Student Name	*	
Email	*	
Master's Program	*	
Current Semester	*	
Related Courses	*	
If passed, mention the grades		
Resume (max 150 words)	*	

max 150 words (if exceeded, your application will be discarded) You may talk about your related projects - publications/competitions/github repositories - work experience, ...

Deadline for submitting the registration form: Same as the Matching System



Important Dates

Deadline for submitting the registration form:

Same as the Matching System

You can find these slides and other info on the course website:

- <https://collab.dvb.bayern/spaces/TUMdlma/pages/2877458001/DLMA+Winter+2026+27>

Don't forget to register at TUM matching system

Register via matching.in.tum.de

