Chair for Computer Aided Medical Procedures (CAMP)
Master Praktikum on
Machine Learning in Medical Imaging

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Technische Universität München + Johns Hopkins Whiting School of Engineering

Chair for Computer Aided Medical Procedures & Augmented Reality

Team

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Course Regulations

Technische Universität München

JOHNS HOPKINS
WHITING SCHOOL
of ENGINEERING

Basic Info about the course

- **Type**: Master Practical Course Module (IN2016)
- **Language**: English
- **SWS**: 6
- **ECTS**: 10 Credits
- **Webpage**:
  - https://collab.dvb.bayern/spaces/TUMmlmi/pages/2374995117/MLMI+Summer+2026
- **Time**:
  - Mondays, 16:00-18:00
- **Location**:
  - Seminar room 03.13.10
- **Requirements**:
  - Background in machine/deep learning
  - Knowledge of software engineering principles (eg. version control, …)
  - Python programming

Objective

- Learn through practice:
  - Adapting Machine Learning techniques to Medical Applications

- The course is divided into:
  - An Introduction to the Cluster in Garching
  - A project involving a machine learning solution to a medical imaging problem
  - Regular meetings with the assigned tutors

Content

Lectures on

- DL for Medical Image Reconstruction
- Semi-Supervised Methods
- Explainable DL
- Uncertainty Analysis
- Generative Models
- Graph Neural Networks
- Transformers
- A few Lectures by Invited Speakers

Projects

Structure:

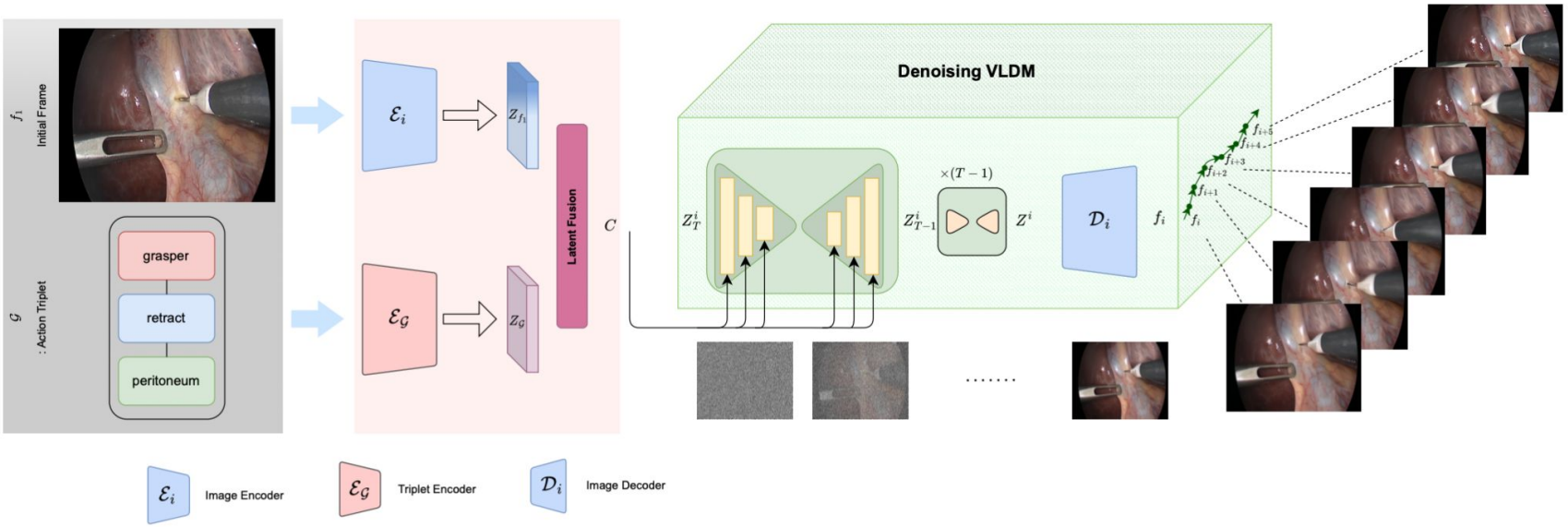
- 5 Groups of 4 students (max. 20 students)
- Weekly meeting with your supervisor

Example: (Previous semester)

Title	Tutors	Proposal	Students
Future Video Generation with Scene Graphs in Medical Imaging	@Azade Farshad @Yeganeh, Y. M.	Future_video_generation.pdf	Yash Vardhan Thirani Rachmadio Noval Lazuardi Amir Hossein Shamseddin Clemens Krispler Emine Dari
Hyperspectral CT Reconstruction	@Nikolas Brasch	Hyperspectral CT Reconstruction.pdf	Haruki Konii Kunal Aggarwal Patris Valera Khaoula Missaoui
Unsupervised Structured Report Generation using Cycle Consistency	@Chantal Pellegrini @Ege Özsoy	MLMI_Unsupervised_Structured_Reporting_via_cycle_consistency.pdf	Zhiang Guo Arda Burak Mamur Maximilian Oberle Mohammad Furqan Lodhi
Zero-shot Conditional Face Generation using Medical Knowledge Graphs	@Azade Farshad @Yeganeh, Y. M.	Zero_shot_Face_Generation.pdf	Tejas Srinivasan Melina Wördehoff Luka Lovrenovic Mert Yilmaz Ikinci
Zero-shot Disease Diagnosis from Facial Features	@Azade Farshad @Yeganeh, Y. M.	Zero_shot_disease_diagnosis.pdf	Ruochen Li Guohao Lin Leni Rohe Michael Lachner

Examples of Projects in Previous Semesters

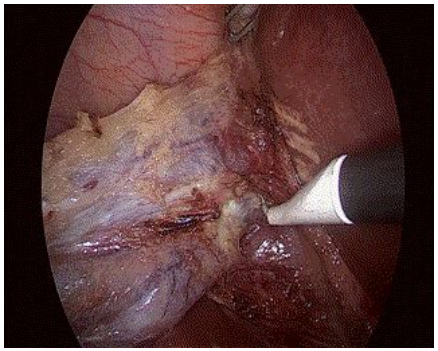
Video Generation using Action Graphs for Surgery

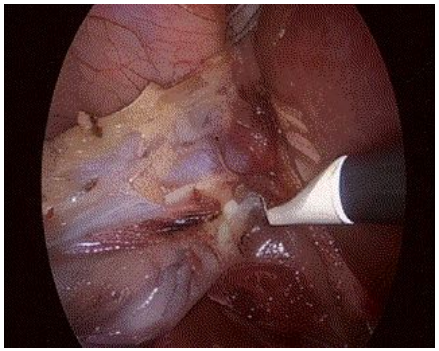


Examples of Projects in Previous Semesters

Video Generation using Action Graphs for Surgery

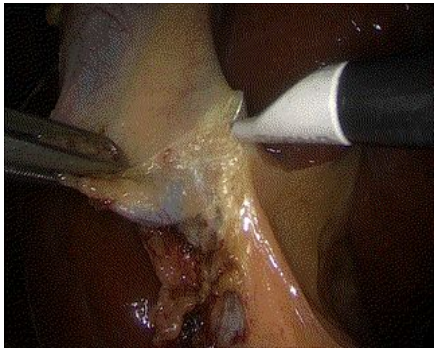
Ground truth | Generated

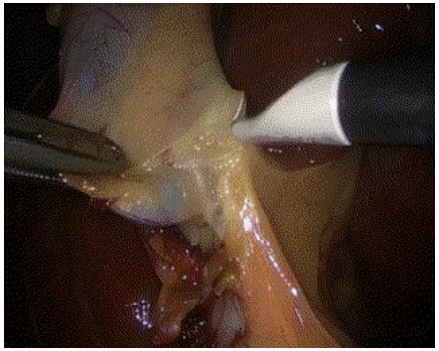




grasper retract liver and hook dissect gallbladder

Ground truth | Generated





grasper retract gallbladder and hook dissect gallbladder

Evaluation

Project: 100%

- **Progress: 50%**
  - Weekly supervision sessions with the tutors
  - Define a list of ToDo's
  - Share a code repository
  - Student's contribution will be monitored on Git
  - Evaluated by the tutor

- **Presentation: 50%**
  - Intermediate Presentation (15 mins + 5 mins. Q&A)
  - Final Presentations (15 mins + 5 mins. Q&A)
  - Evaluated by the all tutors

How can you apply?

- Submit the registration form (on course webpage)

MLMI 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 the registration form: Same as the Matching System

Important Dates

Deadline for submitting the registration form:

Same as matching system

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

https://collab.dvb.bayern/spaces/TUMmImi/pages/2374995117/MLMI+Summer+2026

Don’t forget to register at TUM matching system

Register via matching.in.tum.de

Check the deadline of the Matching System