



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

Slides by:

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Chair for Computer Aided Medical Procedures & Augmented Reality



Team



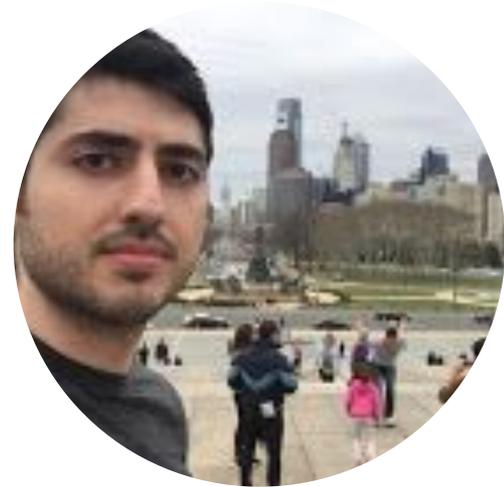
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Course Regulations



Basic Info about the course

- **Type:** Master Practical Course Module (IN2016)
- **Language:** English
- **SWS:** 6
- **ECTS:** 10 Credits
- **Webpage:**
 - <http://campar.in.tum.de/Chair/TeachingSs20MLMI> (files are password-protected)
- **Time:**
 - Thursdays, 16-18
- **Location:**
 - CAMP Seminar Room (03.13.010)
- **Requirements:**
 - Background in machine/deep learning
 - Knowledge of software engineering principles (eg. version control, ...)
 - Python programming



Objective

- Learn through practice:
 - Solving problems in Medical Imaging using machine learning methods
- The course is divided into:
 - A few introductory lectures on machine/deep learning and its application in different problems involving medical imaging
 - A number of hands-on sessions to apply these methods to a given dataset, and
 - A project involving a machine learning solution to a medical imaging problem



Schedule

Example from last semester

Date	Topic	By	Slides	Homework
04.02.2019	Preliminary Meeting	Shadi	Slides	
Online	Project Assignment	Shadi		
25.04.2019	No Class			
02.05.2019	Intro. to Deep Learning	Shadi		
09.05.2019	Neural Networks (NN)	Roger	Slides	Hands-on Hands-on_Solution
16.05.2019	Convolutional Neural Networks (CNN)	Ashkan	Slides	Hands-on Hands-on_Solution
23.05.2019	Convolutional Auto-Encoders (CAE)	Matthias Grimm	Slides	
06.06.2019	Generative Adversarial Networks (GAN)	Azade	Slides	Hands-on Hands-on_Solution
13.06.2019	Intermediate Presentation	all tutors	Guidelines	
27.06.2019				
04.07.2019	Graph Convolutional Networks	Anees	Slides	Evaluation sheets
11.07.2019	Recurrent Neural Networks (RNN/LSTM)	Anjany		
18.07.2019	No Class			
25.07.2019	Final Presentation	all tutors	CAMP Seminar Room, 03.13.010 Time: Thursdays, 12-14 Guidelines	



Projects

Structure:

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

Example: (Previous semester)

ID	Project	Tutor	Group I	Group II	Material
1	Comparison of Uncertainty Estimation techniques in Deep Learning for Medical Applications	Agnieszka and Shadi	Andrei Diaconu, Springer	Abdelhamid, Esposito	Project Description
2	Nerve Segmentation and Classification on Ultrasound and Optoacoustic Imaging	Magda and Walter	Flynn, Giri	Yagubbayli, Alamleh	Project Description
3	Weakly supervised medical segmentation: How to save the annotation cost for training deep segmentation network?	SeongTae			Project Description
4	SIIM-ACR Pneumothorax Segmentation Challenge	Ashkan and Roger	Jahiri, Beheim	Ergin, Faizan	Project Description
5	Robustness in Wasserstein Generative Adversarial Network	Azade	Naeem, Karaoglu	Khanduja, Deo	Project Description
6	Deep learning with adaptive feature acquisition	Gerome	Raj, Bernecker	Elsharnoby, Mullakaeva	Project Description



Evaluation

Project: 100%

- **Progress: 60%**
 - Weekly supervision sessions with the tutors
 - Define a list of ToDo's
 - Share a code repository
 - Student's contribution will be monitored on LRZ Git
 - Evaluated by the tutor
- **Presentation: 40%**
 - Intermediate Presentation (10 mins + 3 mins. Q&A)
 - Final Presentations (20 mins + 5 mins. Q&A)
 - Evaluated by the all tutors

Attending lectures is not mandatory



How can you apply?

- Send us a motivation Email with the title “**MLMI_Application**”
- Send the Email to: **mlmi@mailnavab.informatik.tu-muenchen.de**
- **Template** for Email:
 - Name:
 - Master's program:
 - Current Semester:
 - Related courses (Mentioning the grad if you will):
 - Short Motivation (**Max 3 sentences**. It can include related projects/publications/competitions/github repositories):

Deadline for motivation Emails: 12.02.2020, 11:59 pm



Important Dates

Deadline for motivation e-mails:

12.02.2020, 11:59 pm

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

<http://campar.in.tum.de/Chair/TeachingSs20MLMI>

Don't forget to register at TUM matching system

Register via matching.in.tum.de

07.02 to 12.02.2020

