Introduction to Deep Learning (I2DL)

Exercise 1: Organization

Today's Outline

- Lecture material and COVID-19
- How to contact us
- Exam
- Introduction to exercises
  - Overview of practical exercises, dates & bonus system
  - Introduction to exercise stack
- External students and tum online issues

The Team

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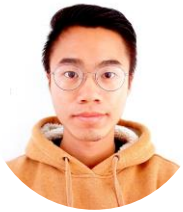

Quoc Trung Nguyen

John Flynn

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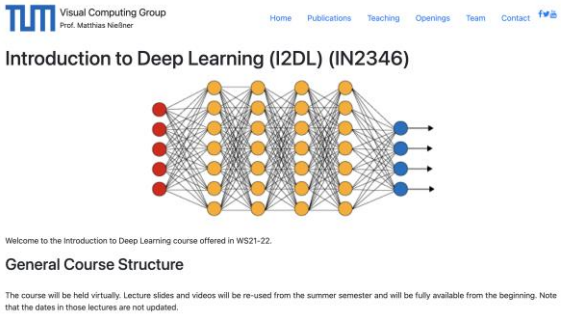
Lecture Material

- Lectures
  - Videos and slides are re-used from the previous online-only iteration of the class in SS2020
  - They are all available on our webpage https://niessner.github.io/I2DL/
  - Recommendation: watch in a weekly fashion

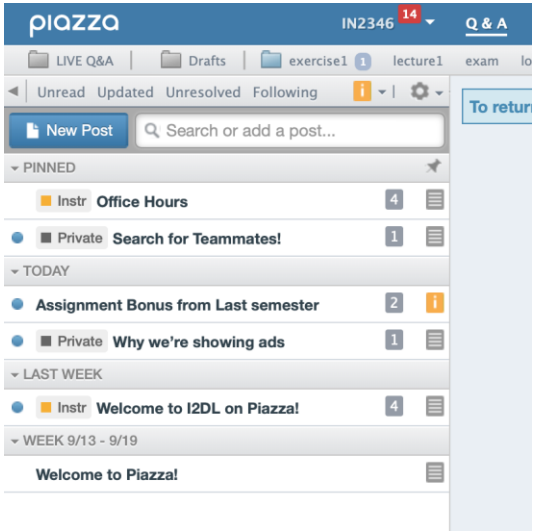
- Exercises (Tutorial session + Homework)
  - Will occur on a weekly basis and material will be uploaded accordingly
  - Release date: Thursday mornings



Availability

- Website (link)
  - Public
  - Contains all videos, exercise material and solutions

- Piazza (link)
  - Link on our website and Moodle
  - Only for LMU/TUM students
  - Links and dates of office hours
  - Exam related information
  - Join with a @mytum.de email



Office Hours

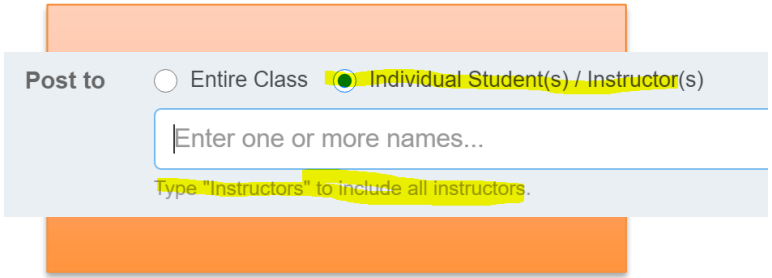
- Starting from: 08.11.2021 (week 3)
- Location: virtual via TUM-Zoom
- Office hours
  - 1 hour long, we offer 2 or 3 each day
  - The precise time slots and links are published on Piazza

Use them to ask questions regarding lecture content or exercises!

Contact

- Any lecture related content:
  https://piazza.com/mytum.de/winter2022/in2346

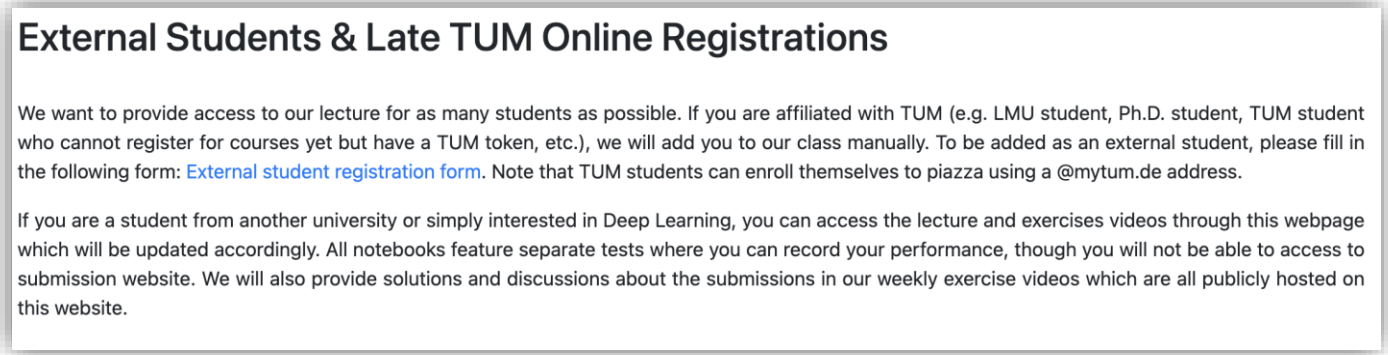
- Any personal questions:
  private question on Piazza



- Unable to access Piazza:
  i2dl@vc.in.tum.de (see next slide)

LMU Students & TUM Online Issues

- Check out the google form we linked on our website.



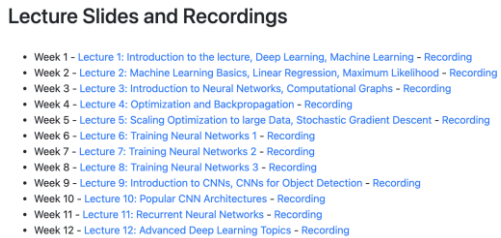
External Students & Late TUM Online Registrations

We want to provide access to our lecture for as many students as possible. If you are affiliated with TUM (e.g. LMU student, Ph.D. student, TUM student who cannot register for courses yet but have a TUM token, etc.), we will add you to our class manually. To be added as an external student, please fill in the following form: External student registration form. Note that TUM students can enroll themselves to piazza using a @mytum.de address.

If you are a student from another university or simply interested in Deep Learning, you can access the lecture and exercises videos through this webpage which will be updated accordingly. All notebooks feature separate tests where you can record your performance, though you will not be able to access to submission website. We will also provide solutions and discussions about the submissions in our weekly exercise videos which are all publicly hosted on this website.

Non TUM/LMU Students

- You can:
  - Participate at lectures as well as exercises
  - Exercises have evaluations in notebooks



Lecture Slides and Recordings

- Week 1 - Lecture 1: Introduction to the lecture, Deep Learning, Machine Learning - Recording
- Week 2 - Lecture 2: Machine Learning Basics, Linear Regression, Maximum Likelihood - Recording
- Week 3 - Lecture 3: Introduction to Neural Networks, Computational Graphs - Recording
- Week 4 - Lecture 4: Optimization and Backpropagation - Recording
- Week 5 - Lecture 5: Scaling Optimization to large Data, Stochastic Gradient Descent - Recording
- Week 6 - Lecture 6: Training Neural Networks 1 - Recording
- Week 7 - Lecture 7: Training Neural Networks 2 - Recording
- Week 8 - Lecture 8: Training Neural Networks 3 - Recording
- Week 9 - Lecture 9: Introduction to CNNs, CNNs for Object Detection - Recording
- Week 10 - Lecture 10: Popular CNN Architectures - Recording
- Week 11 - Lecture 11: Recurrent Neural Networks - Recording
- Week 12 - Lecture 12: Advanced Deep Learning Topics - Recording

- You can't:
  - Have access to our submission system
  - Take part in online discussions on Piazza or attend office hours
  - Participate at the exam

Exam

- Format, date and location
  - Nothing fixed yet, but the current plan is to have an online exam
  - We will publish this information on our website and with an announcement once we have it

Exam: FAQ

- Will there be a retake exam?
  - Not in this semester
  - This class is offered every semester so you will have to pass the exam in the upcoming semester

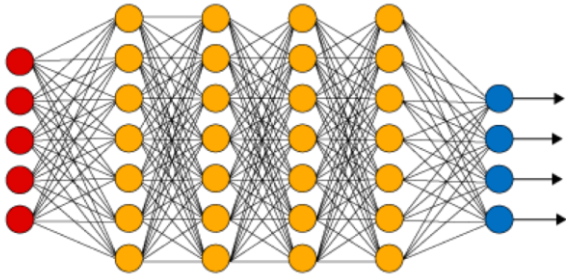
- What about the bonus?
  - Bonus will be transferred to any future iteration of the class automatically
  - This also applies to students who took this class in any previous semester

Exam: FAQ

- Do you publish previous exams?
  - Yes
  - We will share previous exam questions heading up the exam date

Exercises: Goal

- Gather enough experience to start your own individual project



- Focus:
  - Implementations
  - Introduction to common libraries
  - Practical applications

Exercises are exam relevant!

Some notes on "effort" and the exam

- Exercise effort
  - Tutorial sessions generally will be short
  - Practical tasks (~4h/week)

- In the end, you will receive
  - A 0.3 bonus on the final grade, if you pass all but one submission
  - Practical experience for work/internships/thesis

Exercises: Content

- Tutorial Session Videos
  - Organization details
  - additional lecture information when needed

- Jupyter Notebooks
  - Contain coding/practical tasks
  - Are self-explanatory
  - Solutions will be published together with the upcoming exercise

All weekly exercise content is aligned to lectures

Exercises: Software/Hardware

- Programming language
  - Python
- Deep learning library
  - Pytorch
- Hardware
  - A simple CPU will do
  - For later exercises or DL in general: Nvidia GPU

Alternative to GPU: Google Colab

Exercises: Schedule

Exercise 01: Organization Exercise 02: Math Recap	Intro
Exercise 03: Dataset and Dataloader Exercise 04: Solver and Linear Regression Exercise 05: Neural Networks Exercise 06: Hyperparameter Tuning	Numpy (Reinvent the wheel)
Exercise 07: Introduction to Pytorch Exercise 08: Autoencoder	Pytorch/Tensorboard
Exercise 09: Convolutional Neural Networks Exercise 10: Semantic Segmentation Exercise 11: Recurrent Neural Networks	Applications (Hands-off)

Exercises: 8 Submissions

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Exercises: Submissions & Bonus

- Starting from exercise 3:
  - practical exercises, labeled as **submissions**
  - Disclaimer:
    - submissions have a fixed due date until they have to be solved and successfully uploaded.
    - No exceptions

- If you pass 7/8 submission you will receive a 0.3 bonus on the exam grade

Submission Overview

- Every exercise has maximal one submission

- Every submission has a submission goal, e.g.,
  - Goal: Implement a sigmoid function
  - Reachable points [0, 100]
  - Threshold to clear exercise: 100
  - Submission start: <date>
  - Submission deadline: <date>

Upcoming Lecture

- You should have watched this week: *Lecture 1: Introduction to the lecture, Deep Learning, Machine Learning*
- Watch on Monday: Lecture 2: Machine Learning Basics, Linear Regression, Maximum Likelihood
- Next Thursday (28.10): Tutorial Session 2: Math Recap, release of exercises