Deep Learning Course Summer Semester 2020
Covid-19 & Online Teaching Guide (v1.0)

Due to the current situation, all teaching at FAU will be conducted online, including the Deep Learning lectures and exercises. The following document contains the most important information regarding how we will conduct the lecture and exercise sessions. **Read carefully!**

You can get the most up-to-date information by enabling notifications for the forum "General Questions and Announcements"[1] in the StudOn group of this course. Information regarding the general situation can be found at https://www.fau.de/corona/.

Exercises will start on Friday, April 24.

Contents

1 First things first...

- Please make sure you are registered for this course in StudOn [2]
- Enable notifications for the forum[1].
- In the course, please register for the exercises by April 22, 14:00[3]. Otherwise, we cannot guarantee a spot in the exercises for you! We will try to accommodate your preferences regarding specific days as much as possible.
- Please make sure to have Microsoft Teams activated in IDM latest by Wednesday, April 22![4] Otherwise, we also cannot guarantee a spot in the exercises for you! The

[1] Link to the forum:https://www.studon.fau.de/frm2898037.html
[2] Link to course: https://www.studon.fau.de/crs2898025.html
[3] Link to ex. registration: https://www.studon.fau.de/xcos2898045.html
[4] Link to instructions: https://www.anleitungen.rrze.fau.de/medien/ms-teams/[German]

process in IDM takes a minute, but it takes an hour until you can use Teams. So do it right away.

- Join the DL Team in MS Teams[5]
- Note: This course consists of lecture, exam and exercises; the module with 5 ECTS can only be completed if all assignments are completed.
- For questions regarding the organization of the course, please write Sulaiman Vesal (sulaiman.vesal@fau.de) and Katharina Breininger (katharina.breininger@fau.de) directly. For all other questions, please use the forum or write to cs5-deep-tutors@lists.fau.de.

2 Deep Learning - Lecture

- The lecture will be prerecorded and can be watched and rewatched at any time. Note that each lecture unit consists of multiple videos of 10-25 mins.
- You can access the videos at fau.tv[6]. As a backup, the videos are also available at Prof. Andreas Maier's YouTube Channel[7].
- Questions regarding the materials covered in the lecture can be asked by commenting below the videos on YouTube, in the StudOn forum, and during the exercises.

3 Deep Learning - Exercises

- The assignments consist of implementing a framework with the most important DL operators from scratch in Python 3. Later in the course, we will look at PyTorch as a popular DL framework. The first four assigments should be possible to complete on any recent system. You can find suggestions regarding IDEs and Python in section 5.
- The exercise sessions will be conducted via **Microsoft Teams**. This allows us to both present the materials, to answer questions and to provide in-person support as during normal programming exercise sessions. Additional information can be found in section 4 below.
- Again, please make sure to have MS Teams activated in IDM latest by Wednesday, April 22![4]
- Again, make sure that you have joined the DL Team [5].

[5] In MS Teams, go to Teams→"Join or create team"→"Join a team with a code" and enter the code `wdccw1u`
[6] Link to the videos: https://www.video.uni-erlangen.de/course/id/925
[7] Link to playlist: https://www.youtube.com/playlist?list=PLpOGQvPCDQzvgpD3S0vTy7bJe2pf_yJFj

- At least for assignments 1-3, we will provide recordings that cover the slides. Please make sure to look at them to prepare for the exercise sessions and to ask questions beforehand. During exercise sessions, we will again go over the most important concepts and your questions.
- We allow groups of two people, you can use the dedicated channel in Teams to find a group partner.
- Submission of the assignments will be in-person via screen sharing with a tutor and personal presentation of your solution. Note that all members of a group have to present together. After in-person submission, please upload your solution to StudOn. Use the `dispatcher.py` file to zip your solution for upload (more information in the Description).
- Note that we will check submissions for plagiarism, also with previous semesters. We encourage you to help each other, but refrain from sharing (parts of) your solution directly.

4 MS Teams

- Microsoft Teams is a platform that allows for chat, video/screensharing meetings, file storage and more. All members of FAU can get access to MS Teams via the IDM portal, section "Settings and Applications".
- You may either use Teams via web[8] (Note: Firefox and Safari do not support calls) or by installing the Teams App[9].
- Use the Channel *General* for general questions regarding understanding of the materials
- There are different private channels for different exercise days. This is to make sure that students who are registered for a specific exercise will have priority if there are many requests. Our tutor team will make sure that you are added to the correct channel.
- Issue a request for in-person support by writing a message in your exercise day channel that includes the tag `@tutor` and the name of your group partner, if applicable, e.g.,

  ```
  ‘‘@tutor @<Name-of-group-partner> and I need support with <description>’’
  ```

  We will initiate a conversation when it is your turn. Note that we will answer your requests in the order they are posted in the channel.

[8] Teams Web App: https://teams.microsoft.com/
[9] https://teams.microsoft.com/downloads

- Please also use the same strategy if you want to submit an exercise, e.g.

  ‘‘`@tutor @<Name-of-group-partner> and I want to submit Ex. <Ex.#>`’’

- During the exercise sessions, we will present the most important concepts via a call in *General*. You can join this call to listen to the presentation. **When joining the call, please make sure to have your microphone muted and your video off!** If you have questions, please post them in *General*.

- For support and getting started, please visit https://support.office.com/teams

5 Software

5.1 Python and Numpy

Python is an interpreted, high-level, general-purpose programming language. Additional packages complement the functionality of “core” Python. For example, the NumPy package adds support for large multi-dimensional matrices and high level mathematical operations. If you have not worked with Python and NumPy before, please make sure to have a look at beginners guides[10].

Note: The following is only relevant if you work on your on machines. In the CIP pools, there is already a python distribution installed!

We recommend to use the python distribution from **Anaconda/Miniconda** which includes functionality for package management and virtual environments, but feel free to use any distribution of your choice.

5.2 Anaconda

- “Anaconda® is a package manager, an environment manager, a Python/R data science distribution, and a collection of over 7,500+ open-source packages”
  quoted from https://docs.anaconda.com/anaconda/

- Information on how to install for Linux/Max/Windows at
  https://docs.anaconda.com/anaconda/install/

- Version with fewer preinstalled packages: Miniconda
  https://docs.conda.io/en/latest/miniconda.html

- Anaconda/Miniconda support virtual environments that include a specific set of packages. We have prepared the file `dlenvironment.yml` that allows you to create a new virtual environment with all packages necessary for assignments 0-3. You can create the environment by using the command (after installation of Anaconda/Miniconda)

[10] For example: https://docs.python.org/3/tutorial/ and https://docs.scipy.org/doc/numpy/user/quickstart.html.

```
conda env create -f <path-to-yml-file>
```

in a terminal. It creates an environment named DLEx. You can activate/use this environment by typing

```
conda activate DLEx
```

For more information on virtual environments, please have a look at
https://docs.conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html

5.3 IDE

While you can work on the exercises in a simple text editor, integrated development environments (IDEs) can help to simplify programming and debugging significantly. We recommend to use **PyCharm**[11] for this exercise. One additional alternative we want to mention is **Visual Studio Code with the Live Share Plugin**[12]. It allows remote pair programming which may be convenient for working in a group of two.

5.3.1 PyCharm

- In the CIP pools, you can load PyCharm by typing

  ```
  module load pycharm-community
  ```

  in a terminal. You can then start it by typing `pycharm`
- To install it on your own machine, please refer to
  https://www.jetbrains.com/pycharm/
- The community edition is free for everyone. Additionally, JetBrains offers free access to the professional version for students. Please refer to
  https://www.jetbrains.com/community/education/#students for more information.
- To make sure you use the right python interpreter for your project, make sure to set it accordingly in PyCharm. If you use Anaconda/Miniconda, please refer to
  https://docs.anaconda.com/anaconda/user-guide/tasks/pycharm/ and select the **already existing** virtual environment DLEx.
- For information on how to debug with PyCharm, please refer to
  https://www.jetbrains.com/help/pycharm/part-1-debugging-python-code.html
- **Happy Coding!**

[11] Link to PyCharm: https://www.jetbrains.com/pycharm/
[12] Link to VS Code: https://code.visualstudio.com/
Link to Live Share: https://visualstudio.microsoft.com/de/services/live-share/

6 Miscellaneous

- If you have issues attending online classes, e.g., because of your internet connection, please contact tf-stib@fau.de as soon as possible.
- You may use the machines in the CIP pool of the computer science department remotely via SSH, or you may use a graphical login like xpra (https://xpra.org/). Additionally, the CIP admins are working towards an HTML-based xpra client that will allow you to access CIP machines remotely. For more information, please refer to https://wwwcip.informatik.uni-erlangen.de/
- **Stay healthy** :)