Applied machine learning in health sciences
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Welcome letter

Welcome to the C308/02 *Applied machine learning in health sciences* course. This letter will provide you with practical information regarding the course.

Program and location

The course runs over two weeks in January 2023 with classes:

- Monday 9th January, 08:00-16:00
- Wednesday 11th January, 08:00-16:00
- Friday 13th January, 08:00-16:00
- Monday 16th January, 08:00-16:00
- Wednesday 18th January, 08:00-16:00

Scheduled lunch break: 11:45-12:30.

Location: Loftsalen (1266-316) Victor Albeck Bygningen, Vennelyst Boulevard 4, 8000 Aarhus C.

Exam assignment

To be accredited for the course activity there is a mandatory exam assignment (pass/fail, internal evaluation). The exam assignment consists of two parts: Part I: Assignment/exercise portfolio based on in-class exercise work. Part II: Report disseminating a small machine learning project. The two parts must be handed in as a single pdf file via Brightspace, **deadline Friday 3rd February 2023 23:59**. Further details regarding the exam assignment will be available in the lecture slides of the first lecture.

Curriculum and lecture plan

1. **Textbook: ISL**: Introduction to Statistical Learning, 2nd edition.
   Freely available as pdf: https://hastie.su.domains/ISLR2/ISLRv2_website.pdf

2. **Lecture slides/notes, links to video clips, and exercise material:** Will be available on Brightspace.

The lecture plan will be available on Brightspace and contains information about the content

of the course days and a reading list. Please prepare before lectures/course days by self-studying textbook material according to the lecture plan and optionally watch video clips.

Computer and programming software

- Please bring your own laptop (remember charger).
- Programming code used in lecture examples and in exercises will be provided both as Matlab code and as R code, and you can thereby choose to work in your preferred programming language.
- Participants with sufficient experience in other programming languages, e.g. Python are welcome to use this - but no code or technical support is provided.
- Please install your preferred programming software (e.g. Matlab or R) before the first course day. Please ensure that you have a recent version of the software installed (preferable the most recent version, e.g. Matlab 2022b, R 4.2.2).
- If you prefer to work in Matlab:
    - Please install the additional Matlab/MathWorks toolboxes:
        - 1) Statistics and machine learning toolbox.
        - 2) Deep learning toolbox.
    - To install these extra toolboxes in Matlab click the *Add-Ons* icon in Matlab's toolbar. Guide: https://se.mathworks.com/help/matlab/matlab_env/get-add-ons.html
    - If you do not already have Matlab installed there are several options:
    - If you are affiliated with AU and have an au.dk email address, please install Matlab according to the instructions: https://studerende.au.dk/en/it-support/software/matlab/ The webpage has a link *Get Installation Guide* to a pdf file describing how to install Matlab. The installation guide says 2015-2018, however just follow the guide and install the most recent version.
    - If you are affiliated with another university it is likely that you also have access to install Matlab. Please consult your IT-department.
    - You can download a free 30-day trail version at https://se.mathworks.com/campaigns/products/trials.html
- If you prefer to work in R:
    - Please install the following packages:
        - "caret","corrplot","e1071","ggdendro","ggplot2","glmnet","luz", "reshape2","stats","torch","zeallot"
        - To install packages in R, you can type e.g. install.packages("glmnet") in the R console.
- Please install your preferred programming software and the extra toolboxes ahead of course start. If you have problems with installing, please consult your local IT-department, and otherwise please send me an email ahead of course start.

Wifi connection / downloading course material

Wifi is available in Victor Albeck Bygningen and you can connect via eduroam. During the course days, we will work on programming scripts and data files that will be available on Brightspace ahead of each course day. Please download these files before the course days if you do not have access to eduroam.

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I am looking forward to seeing you,

Peter Mondrup Rasmussen, pmr@cfin.au.dk

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