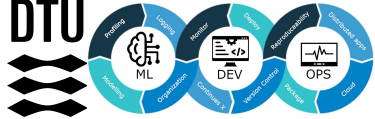


Intro to the course

02476 Machine Learning Operations

Nicki Skafte Detlefsen

Who am I

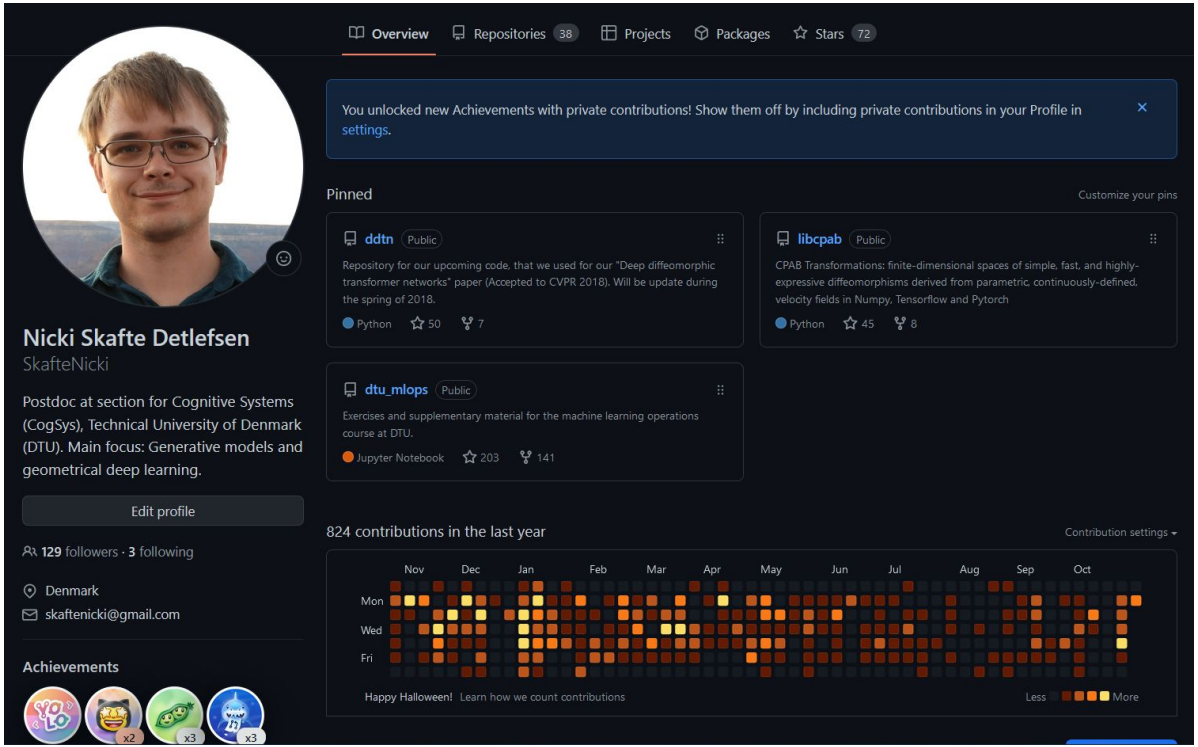
- Bachelor, master, PhD from DTU
- Currently: Postdoc
- Old focus:
  - Inductive biases in deep learning
  - Generative models
  - Geometry aware manifolds
- New focus:
  - MLOps
  - Efficient machine learning

PIONEER CENTRE FOR
ARTIFICIAL INTELLIGENCE

Who am I

- Eager open-source contributor
  - This course is open-source

- ML Engineer at https://lightning.ai/



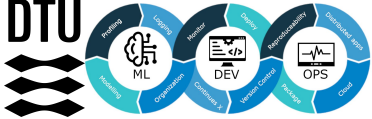
Who else to know about

Søren Hauberg
Co-responsible

Fabian Mager
TA

Nikolaos Nakis
TA

Alison Pouplin
TA



Course settings

- 5 ECTS
- 3 weeks period
- Level: Master
- Grade Pass/not passed
- Type of assessment:
  - Code hand-in
  - Weekly project updates
  - Final oral examination

- Recommended prerequisite
  - General understanding of machine learning (datasets, probability, classifiers, overfitting etc.)
  - Basic knowledge about deep learning (backpropagation, convolutional neural network, auto-encoders etc.)
  - Coding in Pytorch

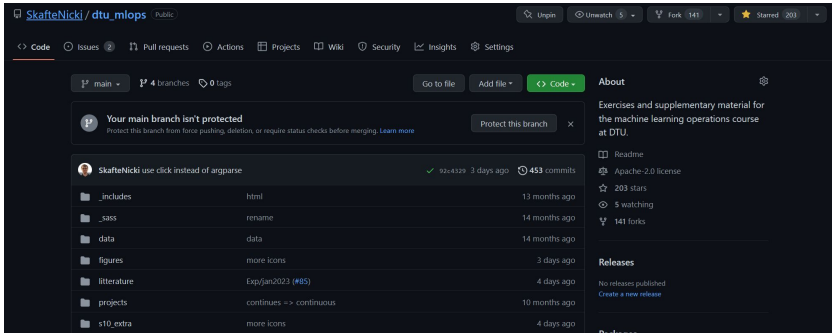
Course webpage

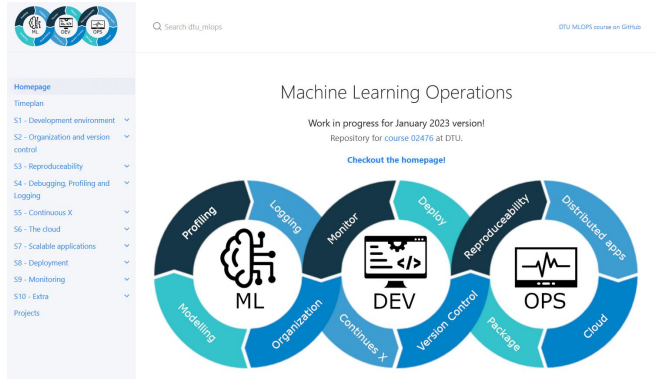
Github:

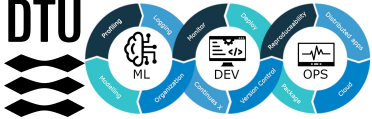
https://github.com/SkafteNicki/dtu_mlops/tree/january2022

Rendered page:

https://skaftenicki.github.io/dtu_mlops/







Communication

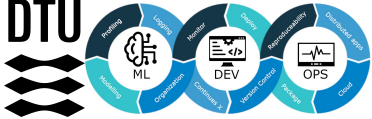
Join the slack channel

https://join.slack.com/t/dtumlops/shared_invite/zt-1j1zx8t4h-nTbUPibR9xCz58erDyyikw

- General announcements
- Asking questions
- Communication with team members

For non public info we use DTU learn

https://learn.inside.dtu.dk



What is this course/What it is not

What is this course:

> *Introduce the student to a number of coding practices that will help them organization, scale, monitor and deploy machine learning models either in a research or production setting. To provide hands-on experience with a number of frameworks, both local and in the cloud, for doing large scale machine learning models.*

Keywords:

- Organization
- Scalability
- Reproducibility
- Hands-on experience

What this course is not:

- How different machine learning models works

What do I expect from you

The course is centered around two principals:

- Learning by doing
- Learning by exploration-exploitation

We provide lectures, exercises and guidance but encourage self study.

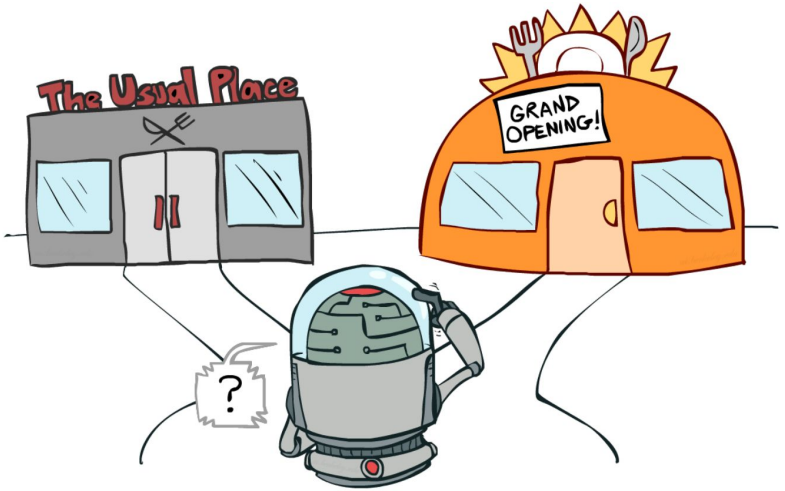
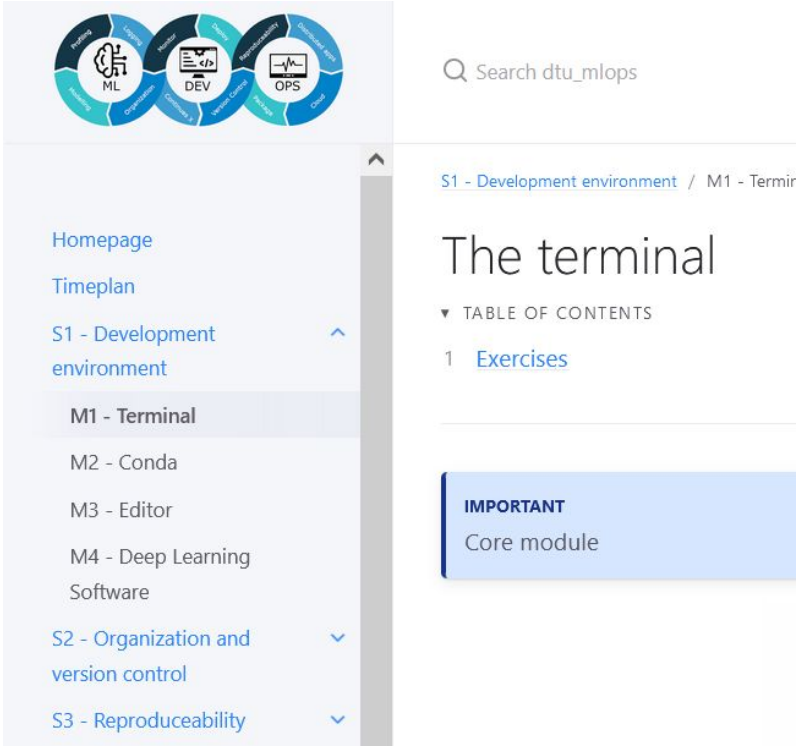


Image credit: https://pub.towardsai.net/openai-wants-to-improve-exploration-in-reinforcement-learning-models-by-using-noise-541ee4dba86a?gi=1f80f46c768

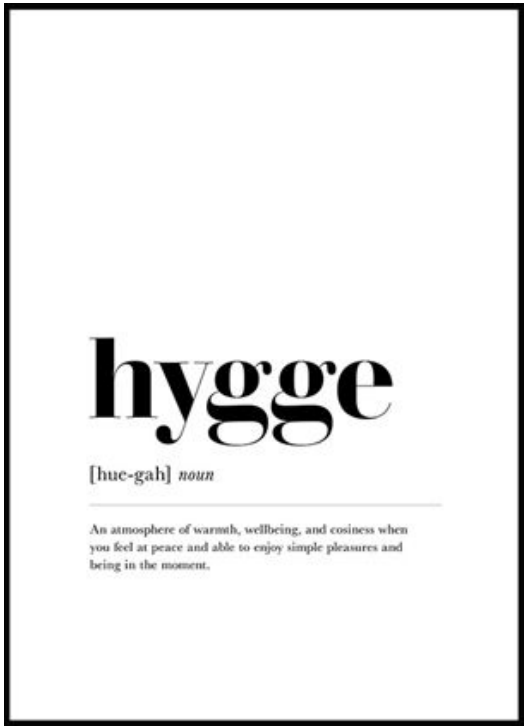
Organisation of material

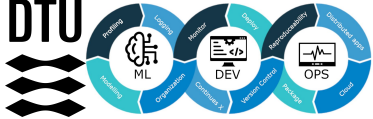
- 1 day = 1 session (S)
- 1 session = multiple modules (M)
- Core modules:
  - Essential in some way
- All other modules are highly recommend
- S10 contains additional modules



What I hope from this course

- Have fun!
- That you get to fill your toolbox with useful frameworks
- (Maybe) Learn something along the way





A typical day in this course

Exercise days:

- Meet in at 9:00
- Lecture for 15-30 mins
  - I am still learning how to do lectures
  - Lectures are not meant to give teach you anything, but provide some context to the topic of the day
- Exercises until 14:00-17:00
  - Remember to take a lunch break
  - Workload will depend on you

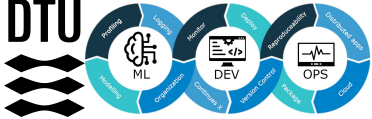
Project days

- Sometimes a small lecture or company presentation
- Rest of the day you work on projects
- Office hour (may be virtual)

Can I work from home?

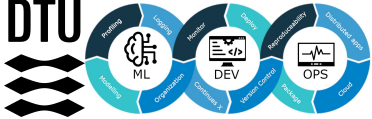
Yes, but we will primarily give support for students physically on campus

Project days you decide internally in the group.



Projects

- Approximately 1/3 of the course time is spend on project work
- More info here: https://skaftenicki.github.io/dtu_mlops/projects
- Already now you are recommended to think about forming groups
  - 4 people (3 and 5 is also acceptable)
  - Thursday we will do some speed dating to form groups for people not already having one.
  - Also feel free to write in the *#find-a-group* slack channel.



Exam

Due to increase in students the exam format has been changed.

Two parts:

1. Written part: An template with ~30 questions that you can fill out as you work on your projects. It will be part of your project Github repository.
2. Oral part: 5 min per group, you get to show us a running demo of your project. Probably quick question for all members.

More on this on Friday.

How to pass

- Meet in and do the exercises
- In the final project:

  Show that you can use the tools you learn about throughout the course

We still have a 100% pass rate after approx ~180 students.

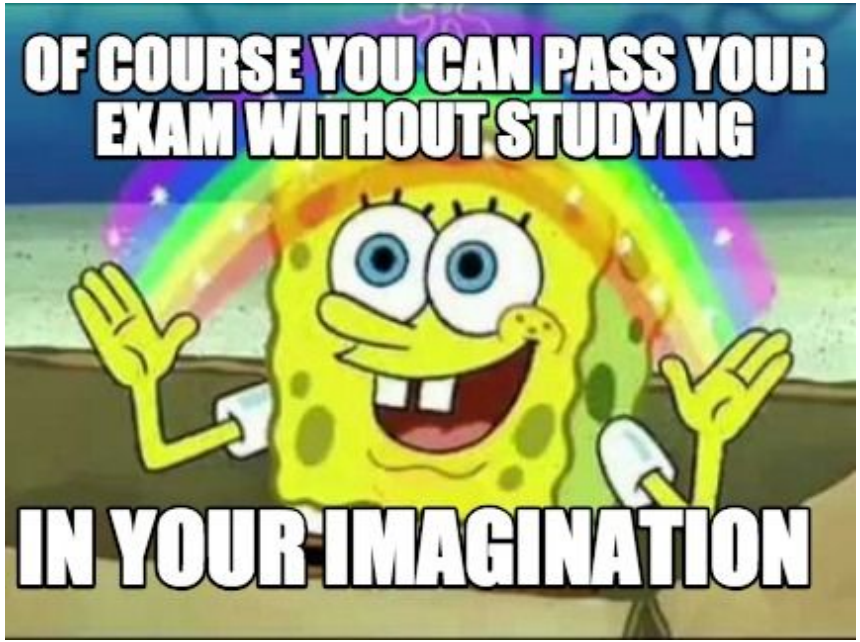
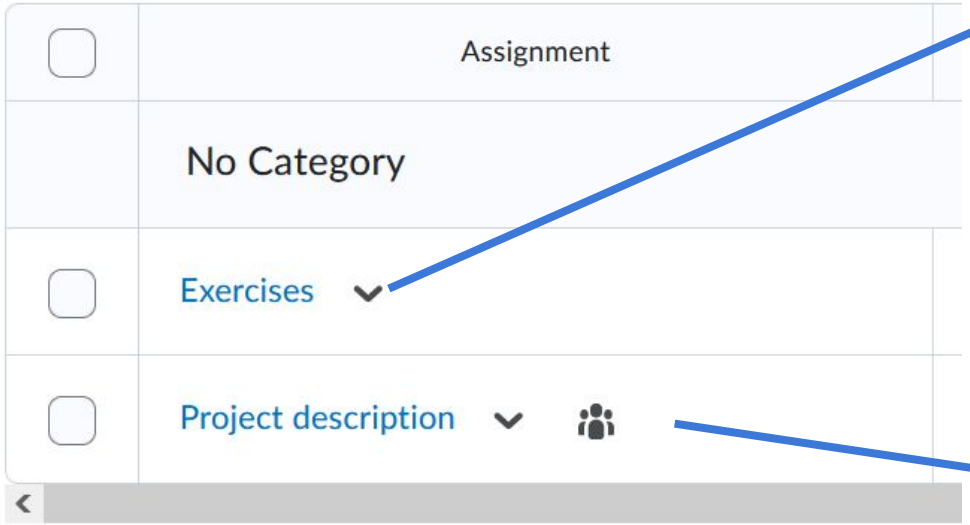
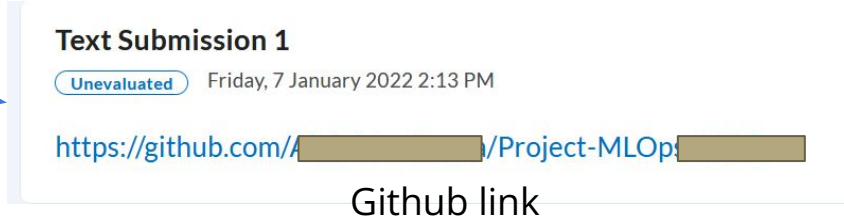


Image credit: https://www.memecreator.org/meme/of-course-you-can-pass-your-exam-without-studying-in-your-imagination/

Hands-in



Big zip file with everything + github link



Github link

Memes

Image credit: https://medium.com/nybles/understanding-machine-learning-through-memes-4580b67527bf