

18.04.24



Machine Learning With TensorFlow

GENERAL INTRODUCTION

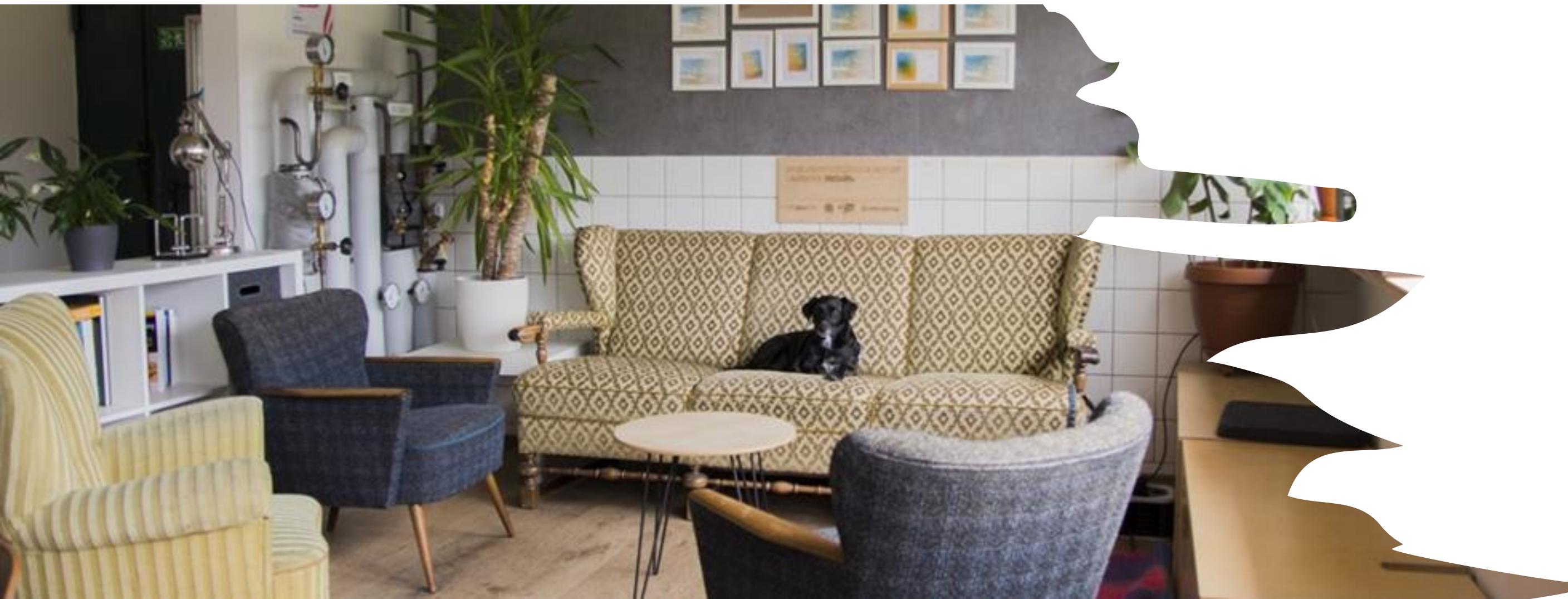
- **Personal Introduction**
- **Intro to opencampus.sh**
- **Organizational Matters**
- **Introductory Discussion on AI**
- **Coursera Registration**
- **Course Projects**
- **ML Frameworks**

PERSONAL INTRODUCTION



- Nonprofit organization which oversees a variety of initiatives
- Offering a wide range of educational opportunities, support, and networking for entrepreneurs, creatives, and anyone curious, regardless of age, educational background, or origin
- The services are open to everyone and mostly free.
- The goal is to support the entrepreneurial landscape, promote creative change processes, and contribute to innovative and sustainable future development.



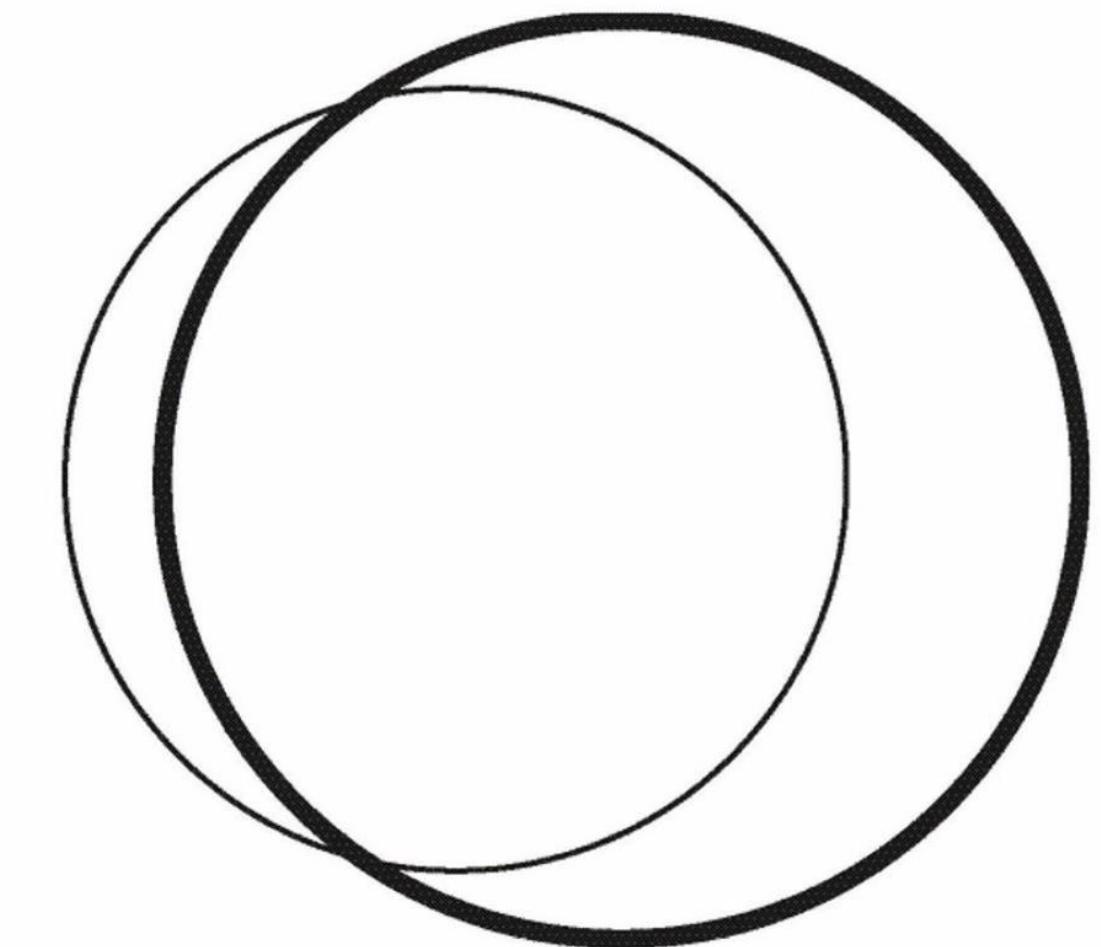




Cobl

COZY WORKING, CULTURE
& EVENTS





KOSMOS

by opencampus.sh





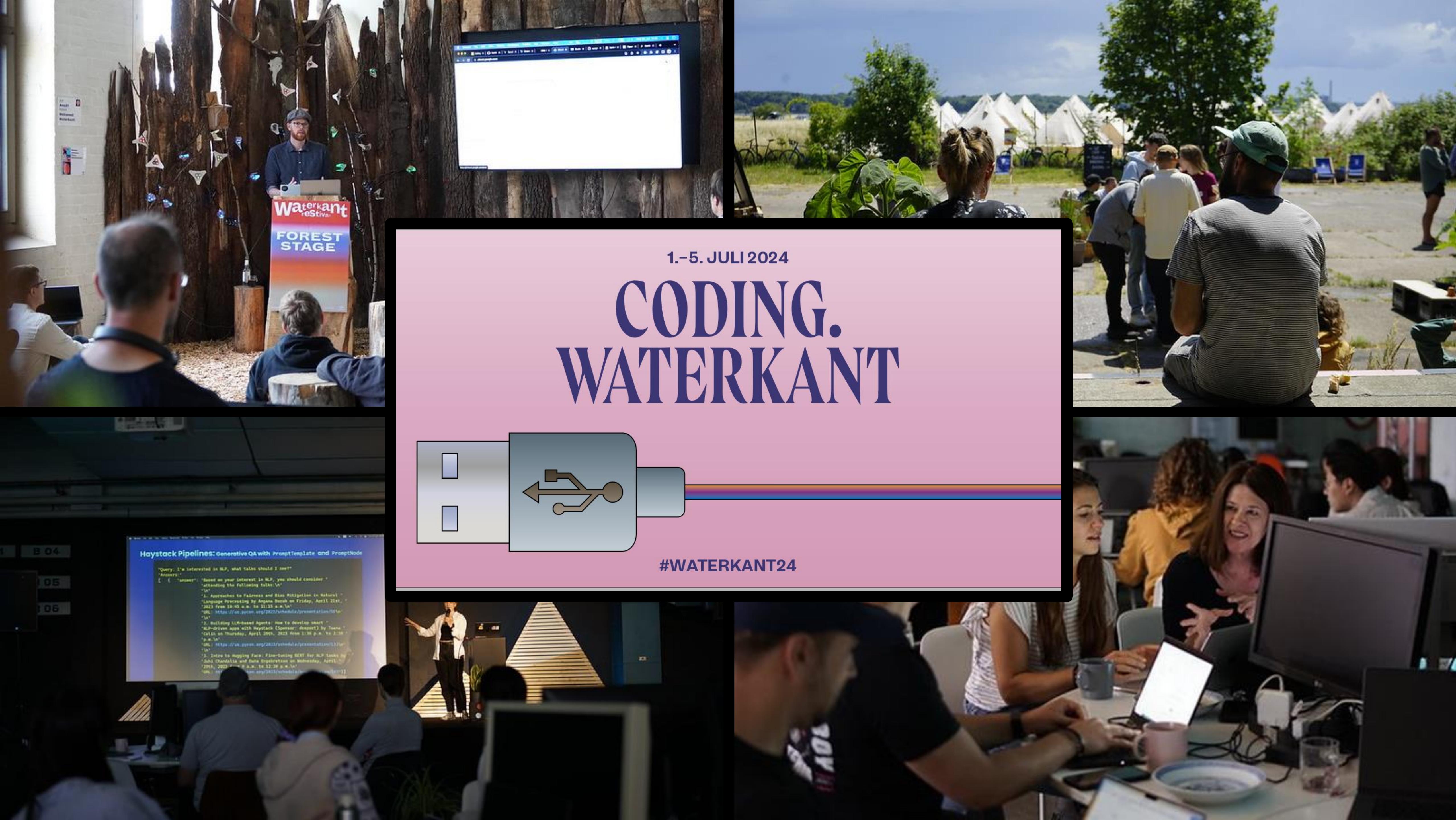
FABLAB KIEL ➤





WATERKANT EXHIBITION 2024





#WATERKANT24

CODING. WATERKANT

- **Work for four consecutive days:**
 - on your own machine learning project or
 - support others in their project
- **Take part in workshops**
- **Get input and feedback by invited experts**
- **Present your work to a larger audience.**
- **Take educational leave**
- **Get accommodation on site**

<https://coding.waterkant.sh>

<https://kiel.ai>

ML Degree

Meetup

Coding.Waterkant

Chat

Kiel.AI

OPENCAMPUS.sh

DiWiSH
DIGITALE WIRTSCHAFT
SCHLESWIG-HOLSTEIN
CLUSTERMANAGEMENT

[Info](#)[Events](#)[Mitglieder](#)[Fotos](#)[Diskussionen](#)[Mehr](#)[Event erstellen](#)[Gruppe verwalten](#)

Über uns

Our meetup is organized with support of opencampus.sh, the Digitale Wirtschaft Schleswig-Holstein (DiWiSH), the AI TransferHub of Schleswig-

[Mehr lesen](#)**m+ Über unsere Mitglieder**

Organizers



opencampus.sh and 5 others
[Nachricht](#)

Members (921)

[Alles ansehen](#)

<https://www.meetup.com/kiel-ai/>

CHAT

The screenshot shows a Slack channel interface. At the top left, there's a user profile for 'sose21' (@steffen). The channel name is 'C_Machine Learning With TensorFlow'. A yellow arrow points from the channel name towards the search bar at the top right. The search bar contains the placeholder 'Search'. Another yellow arrow points from the search bar towards the pinned post on the right side.

ANNELS

- 00 - Announcements
- 01 - Questions
- C_Advanced Machine Lear...
- C_Deep Learning from Scr...
- C_Einführung in Data Scie...
- C_Machine Learning für di...
- C_Machine Learning With ...**
- Kursleitungen

Beginning of C_Machine Learning With TensorFlow

This is the start of the C_Machine Learning With TensorFlow channel, created by Steffen Brandt on March 02, 2021. Any member can join and read this channel.

Pinned Posts

C_Machine Learning With TensorFlow

Steffen Brandt 23:10 Welcome to the course "Machine Learning With TensorFlow"! In this course we will try to provide you with hands-on knowledge about how to train machine learning models with TensorFlow. An important part when working in the field of machine learning is networking and working together in a team. An important goal of the course is therefore that you get to know each other and work in a team on a project. I would therefore like to ask you to introduce yourself quickly here in the channel already. Maybe

March 25

Pinned

Steffen Brandt 23:10 Welcome to the course "Machine Learning With TensorFlow"!

- Please, ask questions to us in the chat

COURSE HANDBOOK



opencampus.sh Machine
Learning Program

EDU-Platform

Chat

Search...

opencampus.sh Machine Learning
Program

Course Kick-Off

How do I choose a course?

FAQ

COURSES

Einführung in Data Science und
maschinelles Lernen >

Machine Learning with
TensorFlow ▾

Requirements for a Certificate of
Achievement or ECTS

Preparation

Week 1 - General Introduction

Week 2 - Introduction to
TensorFlow, Part I

Week 3 - Introduction to

Week 1 - General Introduction

This week you will...

- get a basic introduction to neural nets in order to get a first intuition in the underlying mechanisms
- get a first idea about possible projects you might want to work on throughout the course

Learning Resources



220419_Introduction to Neural Nets.pdf 4MB
PDF

- Video Neural Networks Explained (12 minutes)
- Introductory course on Python from Kaggle
- Tutorial on Colab on Medium

ORGANIZATIONAL MATTERS

- **Use your full names in the zoom meetings!**
- **Scan the QR-Code if you participate in presence**
- **Complete your profile in the Mattermost chat with your full name and a photo.**
- **Please write us if you will not go on with the course!**

ZOOM

- Try the different viewing modes:
 - Gallery View/ Active Speaker
 - Split Screen/ Full Screen Mode
- Maybe watch this video to get an idea:
<https://www.youtube.com/watch?v=v3IPAbpVjd4>

The screenshot shows the Zoom Meeting interface with the Settings window open. The Settings window has a sidebar with icons for General, Video, Audio, Share Screen, Chat, Background & Filters, Recording, Profile, Statistics, Keyboard Shortcuts, and Accessibility. The 'Share Screen' option is highlighted with a blue bar and a yellow arrow pointing to it from the left.

Window size when screen sharing:

- Fullscreen mode
- Maximize window
- Maintain current size

When I share my screen in a meeting

- Automatically share desktop
- Show all sharing options

When I share directly to a Zoom Room

- Automatically share desktop
- Show all sharing options

Advanced

Video Settings...

Steffen Brandt

Mute Start Video Security Participants

18.04.2024	Introduction	
18:15 - 20:00	Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE	
25.04.2024	Introduction to TensorFlow for AI, Machine Learning, and Deep Learning, Part I	
18:15 - 20:00	Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE	
02.05.2024	Introduction to TensorFlow for AI, Machine Learning, and Deep Learning, Part II	
18:15 - 20:00	Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE	
09.05.2024	Project Work	
18:15 - 20:00	Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE	30.05.2024 Convolutional Neural Networks, Part I
16.05.2024	Natural Language Processing, Part I	18:15 - 20:00 Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE
18:15 - 20:00	Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE	06.06.2024 Convolutional Neural Networks, Part II
23.05.2024	Natural Language Processing, Part II	18:15 - 20:00 Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE
18:15 - 20:00	Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE	13.06.2024 Sequences, Time Series and Prediction, Part I
		18:15 - 20:00 Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE
		20.06.2024 Sequences, Time Series and Prediction, Part II
		18:15 - 20:00 Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE
		27.06.2024 Presentation of the Final Projects, Part I
		18:15 - 20:00 Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE
		04.07.2024 Presentation of the Final Projects, Part II
		18:15 - 20:00 Starterkitchen, Kuhnkestr. 6, 24118 Kiel + ONLINE

Coding.Waterkant 

FIRST BREAKOUT

- **15-20 Minutes**
- **Present yourself**
- **Discussion Questions:**
 - **Do you know examples for Machine Learning?**
 - **Do you know examples for Deep Learning?**

Artificial Intelligence

A science devoted to making machines think and act like humans.

Machine Learning

Focuses on enabling computers to perform tasks without explicit programming.

Deep Learning

A subset of machine learning based on artificial neural networks.

Artificial Intelligence

Machine Learning

Deep Learning

//

DO NOT SIGN UP FOR THE SPECIALIZATION

For Individuals For Businesses For Universities For Governments

coursera Explore ▾ What do you want to learn? 

Online Degrees ▾ Find your New Career Log In **Join for Free**

Home > Browse > Data Science > Machine Learning

 DeepLearning.AI

DeepLearning.AI TensorFlow Developer Professional Certificate

 Taught in English | [8 languages available](#) | Some content may not be translated

 Instructor: [Laurence Moroney](#)

 Financial aid available

186,170 already enrolled

Professional Certificate - 4 course series
Earn a career credential that demonstrates your expertise

4.7 ★ (20,734 reviews)

Intermediate level
No previous experience necessary

2 months at 10 hours a week

Flexible schedule
Learn at your own pace

[View all courses](#)

A large red arrow points upwards from the "View all courses" button towards the "Join for Free" button.

About Outcomes Courses Testimonials

CLICK ON THE INDIVIDUAL COURSE

Professional Certificate - 4 course series

TensorFlow is one of the most in-demand and popular open-source deep learning frameworks available today. The DeepLearning.AI TensorFlow Developer Professional Certificate program teaches you applied machine learning skills with TensorFlow so you can build and train powerful models.

[Read more](#)

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

Course 1 • 17 hours • 4.8 ★ (18,883 ratings)

What you'll learn

- ✓ Learn best practices for using TensorFlow, a popular open-source machine learning framework
- ✓ Build a basic neural network in TensorFlow
- ✓ Train a neural network for a computer vision application
- ✓ Understand how to use convolutions to improve your neural network

Skills you'll gain

Computer Vision Tensorflow Machine Learning

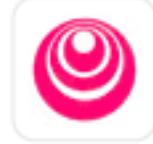
Convolutional Neural Networks in TensorFlow

Course 2 • 16 hours • 4.7 ★ (7,912 ratings)

Instructor

 **Laurence Moroney**
DeepLearning.AI
15 Courses • 456,481 learners

Offered by

 **DeepLearning.AI**
[Learn more](#)

ENROLL FOR INDIVIDUAL COURSE

For Individuals For Businesses For Universities For Governments

coursera Explore ▾ What do you want to learn? 

Online Degrees ▾ Find your New Career Log In **Join for Free**

Home > Browse > Computer Science > Software Development

 DeepLearning.AI

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

This course is part of [DeepLearning.AI TensorFlow Developer Professional Certificate](#)

 Taught in English | [8 languages available](#) | Some content may not be translated

 Instructor: [Laurence Moroney](#)

Enroll for Free
Starts Oct 20

Financial aid available

350,206 already enrolled

Course
Gain insight into a topic and learn the fundamentals

4.8 ★ (18.883 reviews) |  96%

Intermediate level
Recommended experience [\(i\)](#)

17 hours (approximately)

Flexible schedule
Learn at your own pace

[View course modules](#)



SELECT AUDIT MODUS

The screenshot shows the Coursera website interface. At the top, there are navigation links for 'For Individuals', 'For Businesses', 'For Universities', and 'For Governments'. The 'For Individuals' link is highlighted. Below the header, the Coursera logo is on the left, followed by a search bar containing 'What do you want to learn?' and a magnifying glass icon. To the right of the search bar are links for 'Online Degrees', 'Find your New Career', 'English', and a user profile for 'Steffen als Student'. The main content area displays a course card for 'Stanford Supervised Machine Classification'. The course title is in large red text. Below it, it says 'This course is part of [Machine Learning Specialization](#)'. It indicates that the course is taught in English and available in 8 languages. Instructors are listed as Andrew Ng and others, with a 'Top Instructor' badge. A blue button says 'Enroll for Free Starts Oct 20'. Below this, it shows '454,312 already enrolled'. On the right side of the course card, a modal window is open, titled '7-day Free Trial'. It explains that the course is part of a specialization and lists five benefits with checkmarks: 'Unlimited access to all courses in the Specialization', 'Cancel anytime.', '\$45 per month to continue learning after trial ends.', and 'Certificate when you complete.'. A 'Start Free Trial' button is at the bottom of the modal. A red arrow points from the bottom of the course card towards the 'Audit the course' link at the bottom of the page.

For Individuals For Businesses For Universities For Governments

coursera Explore What do you want to learn? Online Degrees Find your New Career English Steffen als Student

Home > Browse > Data Science > Machine Learning

Stanford
Supervised Machine Classification

This course is part of [Machine Learning Specialization](#)

Taught in English | 8 languages available |

Instructors: [Andrew Ng +3 more](#) Top Instructor

Enroll for Free Starts Oct 20

Try for Free: Enroll to start. Financial aid available

454,312 already enrolled

[About](#) [Outcomes](#) [Modules](#) [Audit the course](#)

7-day Free Trial

Supervised Machine Learning: Regression and Classification is part of the larger Machine Learning Specialization. Your 7-day free trial includes:

- ✓ **Unlimited access to all courses in the Specialization**
Watch lectures, try assignments, participate in discussion forums, and more.
- ✓ **Cancel anytime.**
No penalties - simply cancel before the trial ends if it's not right for you.
- ✓ **\$45 per month to continue learning after trial ends.**
Go as fast as you can - the faster you go, the more you save.
- ✓ **Certificate when you complete.**
Share on your resume, LinkedIn, and CV.

Start Free Trial

Audit the course

EXERCISES

- **Each week two to four of you will present the exercises given in the course handbook**
- **Each of you presents at least once**

**EXERCISES:
WHO WILL PRESENT NEXT WEEK?**

PROJECTS

Option 1:

Bring your own idea and data

Option 2:

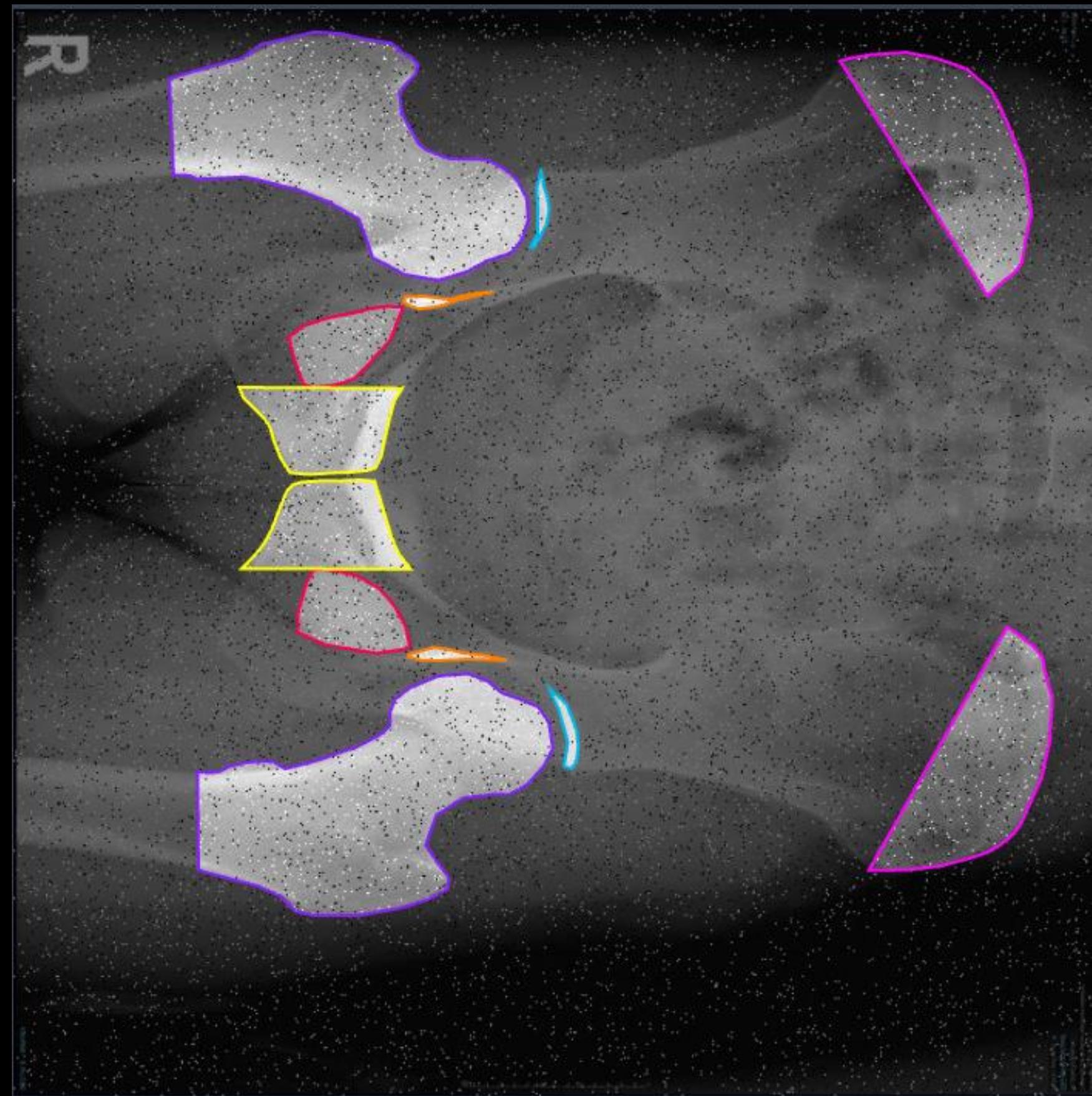
Do one of the two default projects

RELEVANCE OF THE PROJECTS

- **Most important for a career in ML will be work experience and your GitHub profile**
- **Focus on building a noteworthy GitHub project repository**
- **Use the template repository**
- **Outstanding projects will be nominated for the VDE prize**

SEGMENTATION OF THE THIGH BONE (FEMUR) ON PELVIC X-RAY IMAGES

- Partner:
[**i²Lab**](#) at the UKSH
- Goal:
The goal is to use artificial neural networks, like U-Net, to automatically segment the femur and five other anatomies on clinical hip X-rays, specifically pelvis AP X-rays.
- Data:
 - **2D X-ray images (jpeg)**
 - **458 images of 3000 by 3000 pixels.**
 - **Segmentation masks for six different classes (anatomies).**



PREDICTION OF PATIENT TREATMENT TIMES

- Partner:
MintCode Solutions with their product HappyQ

- Goal:

• • •

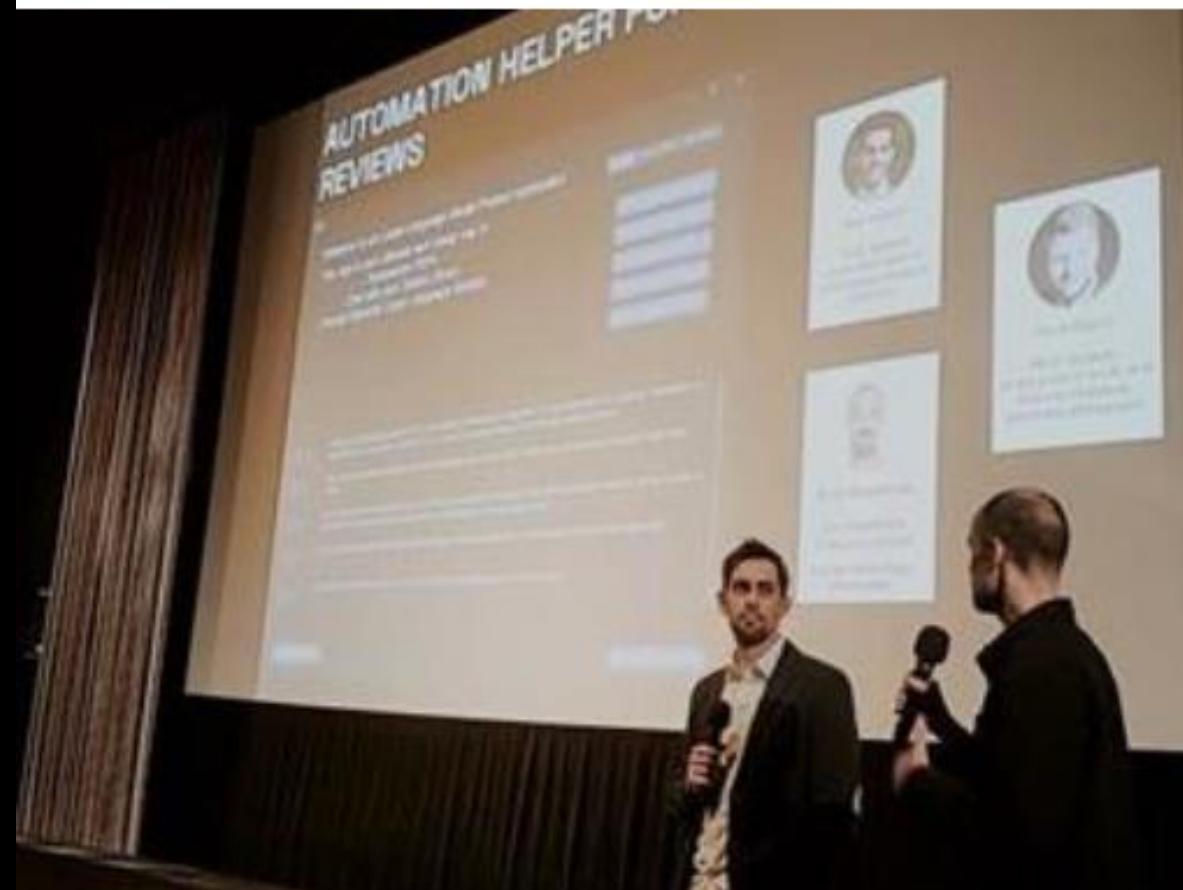
- Data:

• • •

The screenshot displays the HappyQ software interface. On the left, a sidebar menu includes 'Dashboard', 'Wartezimmer' (selected), 'Warteschlange', 'Notfallsprechstunde', 'Statistik (tbd)', and 'Einstellungen'. The main content area is divided into four sections: 'Warteschlangen' (Manage waiting lists and patient flow), 'Terminverwaltung' (Optimize patient care with automation, making it easier to manage patient disposition even with staff absences. Focus on stress-free care for a smooth patient experience.), 'Notfallsprechstunde' (Optimize emergency consultations with flexible planning and adaptation to your practice's needs. Patients can easily book appointments and stay informed about the current status.), and 'Kalenderanbindung' (Integrate HappyQ appointments into your calendar. We support installation and setup.). A patient list on the right shows 'M. Mustermann' with two entries: 'G# 69 Raum 2 08:15' and 'G# 63 Raum 2 08:25'. Each entry has edit and delete icons.

Aktionen	Nr.	Raum	Beginn
= ⎏ ⚡	G# 69	Raum 2	08:15
= ⎏ ⚡	G# 63	Raum 2	08:25

VDE SPECIAL PRIZE MACHINE LEARNING



COURSES

Fine-Tuning and Deployment of Large Language Models

Archive

EVENTS

Coding.Waterkant 2023

Prototyping Week

PROJECTS

[How to Start, Complete, and Submit Your Project](#)

Possible Projects

Past Projects

ADDITIONAL RESOURCES

Glossary

Coursera

Selecting the Optimizer

Choosing the Learning Rate

Learning Linear Algebra

Learning Python

Support Vector Machines

ML Statistics

TOOLS

Git

RStudio

Google Colab

Zoom

How to Start, Complete, and Submit Your Project

In all Machine Learning courses you have:

- to complete a machine learning project in a team of up to 4 participants,
- attend at least all but 2 sessions of the course, and
- use the provided project template repository for documentation (unless otherwise instructed).

Starting Your Project

Working on Your Project

Submitting Your Project

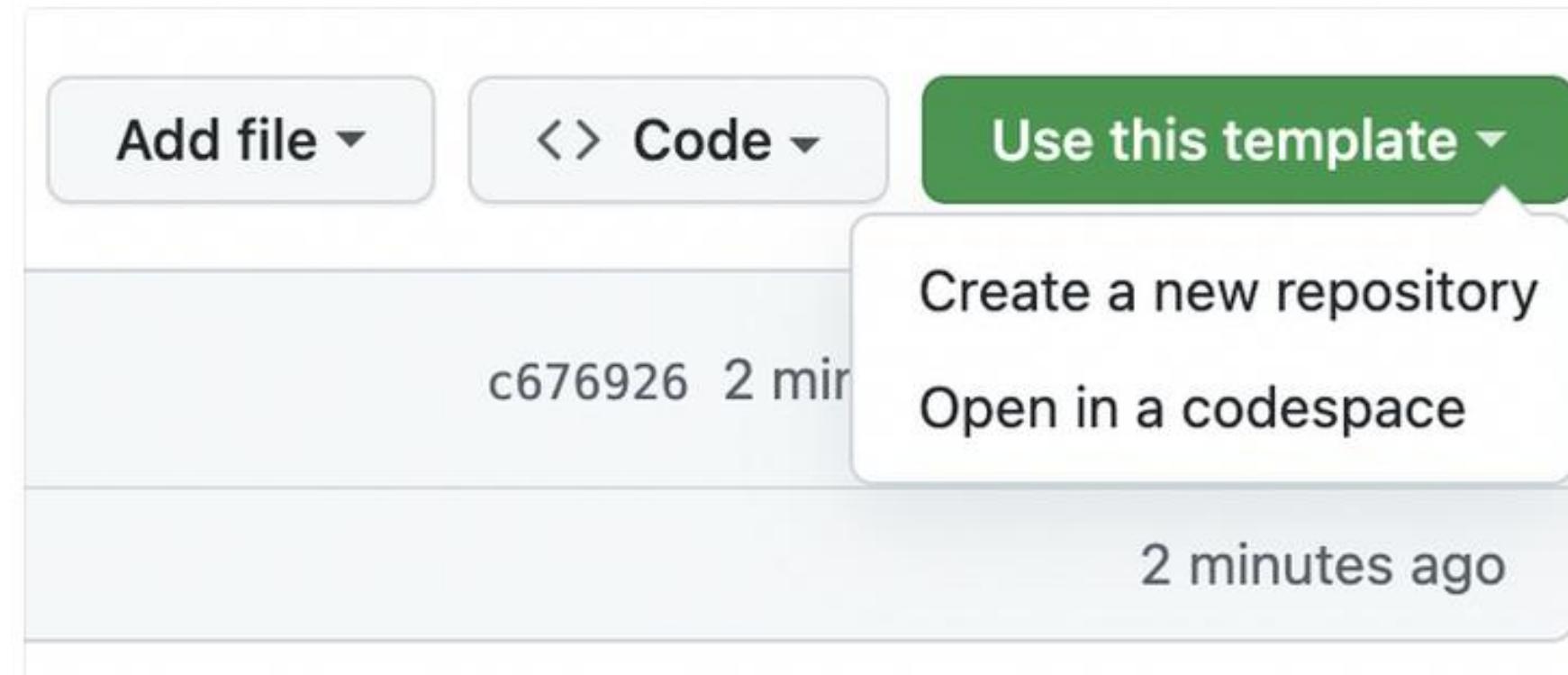
Was this helpful?



Export as PDF

Starting Your Project

1. [Navigate to the Template Repository](#)
2. **Use this Template:** Above the file list, click the "Use this template" button.



Use this template button

3. **Create Repository from Template:** You'll be prompted to name your new repository and you can choose whether it should be public or private. You'll also have the option to include all branches in the template repository, if there are more than one.
4. **Create Repository:** Click "Create repository from template" to create the new repository.
5. **Clone the New Repository:** You can now clone the new repository to your local machine using `git clone` and start working on your project.

Working on Your Project

PROJECT INTERESTS

GOOGLE COLAB

 opencampus.sh Machine Learning Program

EDU-Platform Chat

Q Search...

Coding.Waterkant Hackathon

Prototyping Week

PROJECTS

Requirements

Possible Projects

Past Projects

ADDITIONAL RESOURCES

Glossary

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Choosing the Learning Rate

Learning Linear Algebra

Learning Python

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RStudio

Google Colab

Zoom

Google Colab

Programming Environment to develop and train Neural Networks in the Google Cloud

Colab is an online **programming environment** for Python including a free runtime with a GPU and is the standard programming environment for our machine learning projects.

The following blog article provides you with a great written introduction to Google Colab:

Google Colab 101 Tutorial with Python – Tips, Tricks, and FAQ

An in-depth tutorial on how to use Google Colab with Python, along with Colab's tips, tricks, and FAQ

medium.com



If you want to get a little bit deeper into using Colab, make sure to also read this blog article:

Configuring Google Colab Like A Pro

How to Do Research Quality Machine Learning on a Budget

medium.com

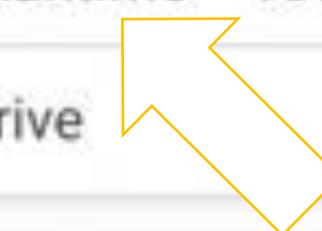




+ Code

+ Text

Copy to Drive



Connect

Editing



Getting Started

The document you are reading is a [Jupyter notebook](#), hosted in Colaboratory. It is not a static page, but an interactive environment that lets you write and execute code in Python and other languages.

For example, here is a **code cell** with a short Python script that computes a value, stores it in a variable, and prints the result:

```
[ ] seconds_in_a_day = 24 * 60 * 60  
seconds_in_a_day
```

86400

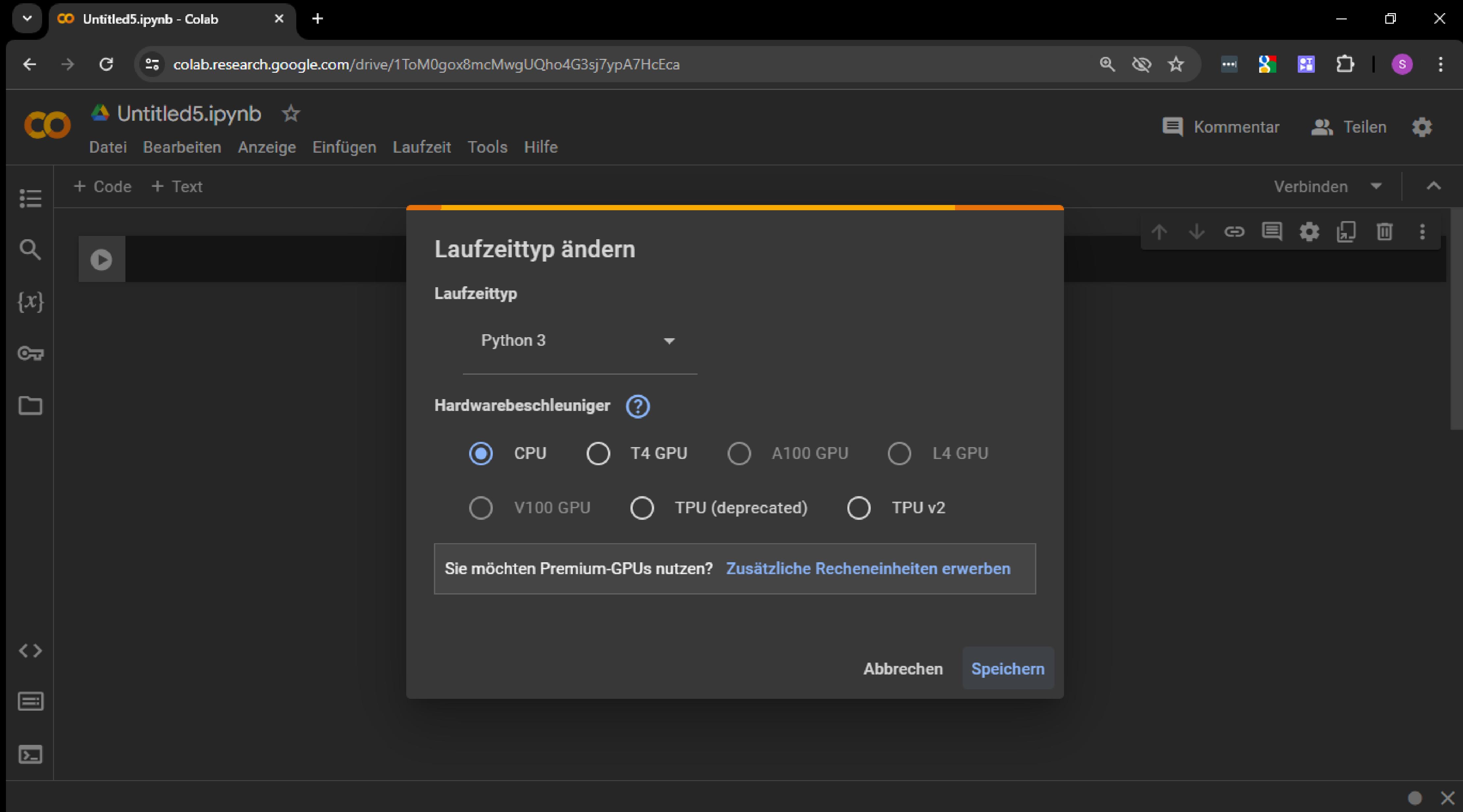
To execute the code in the above cell, select it with a click and then either press the play button to the left of the code, or use the keyboard shortcut "Command/Ctrl+Enter".

All cells modify the same global state, so variables that you define by executing a cell can be used in other cells:

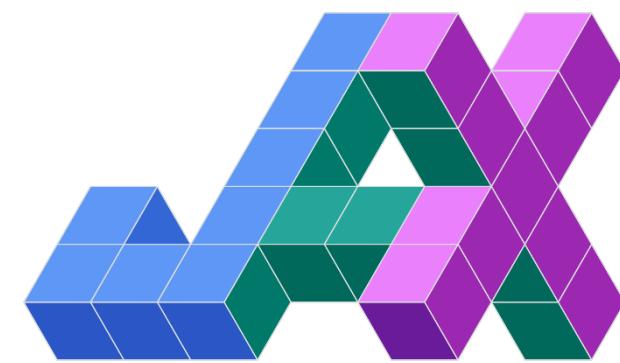
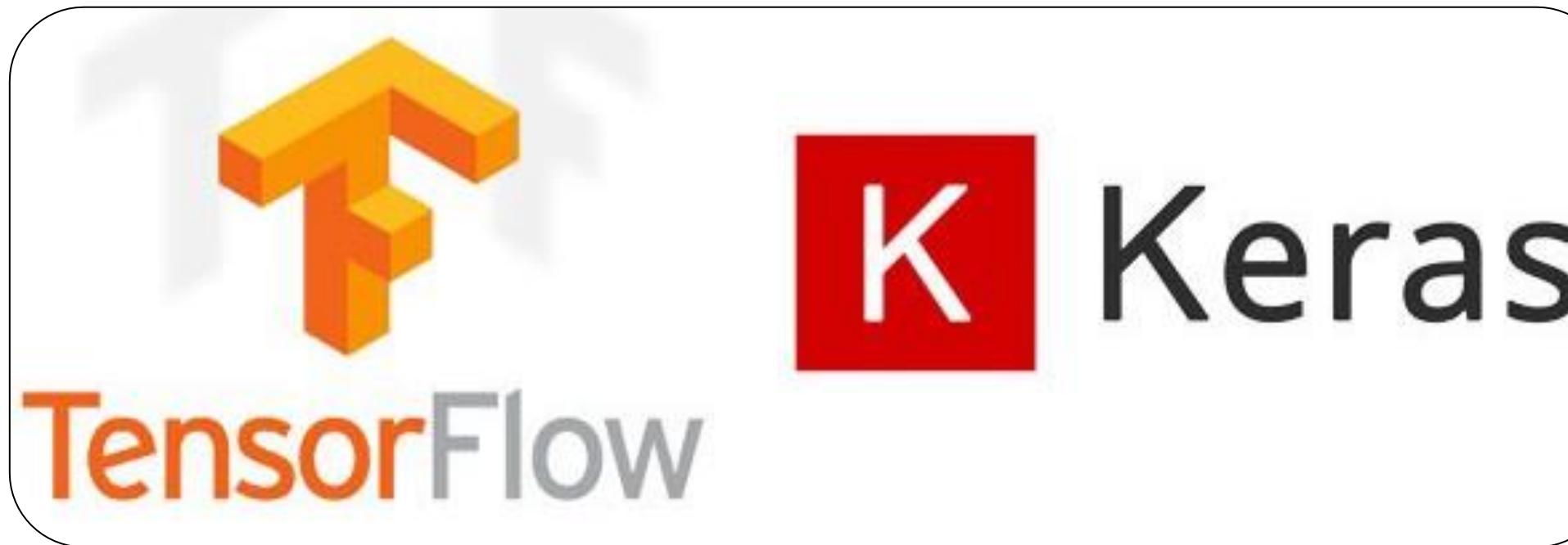
```
[ ] seconds_in_a_week = 7 * seconds_in_a_day  
seconds_in_a_week
```

604800

For more information about working with Colaboratory notebooks, see [Overview of Colaboratory](#).



ML LIBRARIES (LOWER LEVEL)



P Y T  R C H

ML LIBRARIES (HIGHER LEVEL)



Transformers

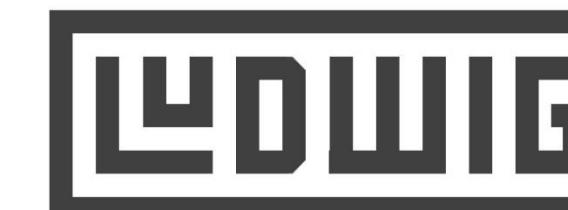
spaCy



LangChain



haystack
by deepset



DEVELOPMENT ENVIRONMENTS



Google Colaboratory



Visual Studio Code



PyCharm



TASKS UNTIL NEXT WEEK

- Completion of the learning material of week 1 and 2 of the course "introduction to TensorFlow"
- Complete the two assignments given in the following notebooks:
 - [Assignment Notebook 1](#)
 - [Assignment Notebook 2](#)(Who presents?)
- Bring questions!