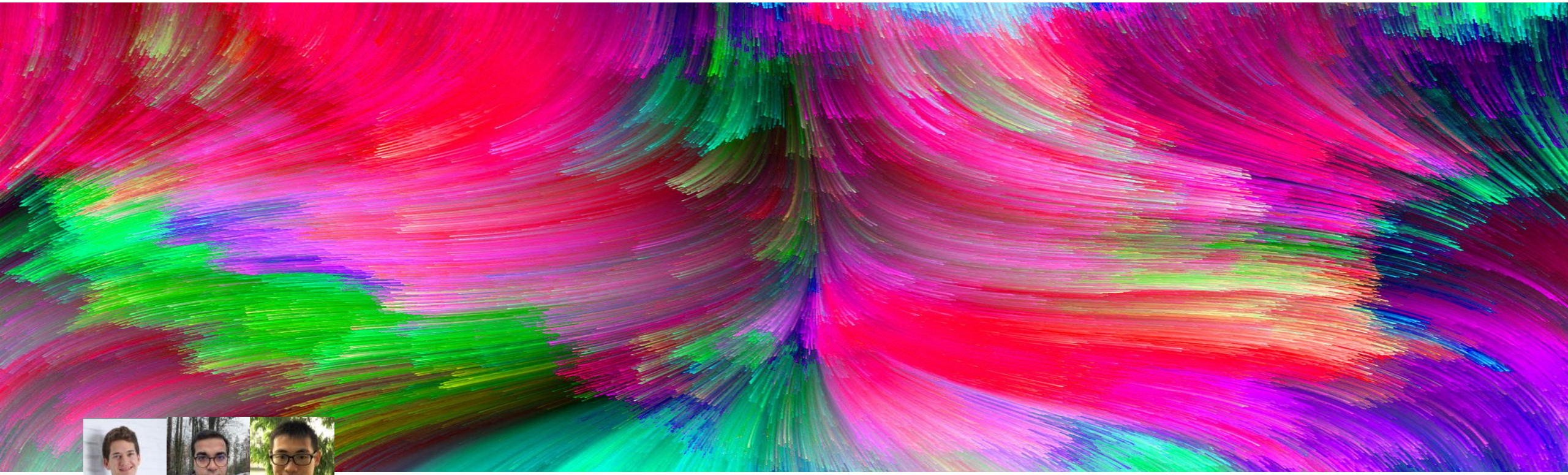


Spring Term 23 - 8,860,1.00 CS Machine Learning

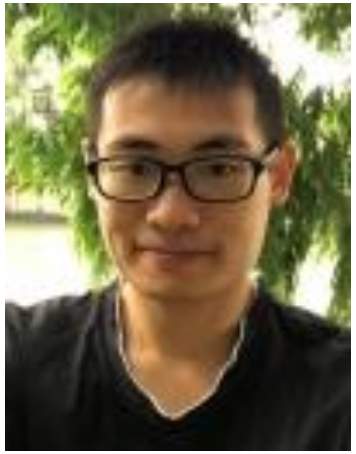
Lab 01 – Introduction to Co-Lab

Linus, Hamed, and Shijun

Lab Teaching Assistants (TAs)

Linus Scheibenreif
ICS-HSG, Room: 61-502
linus.scheibenreif@unisg.ch
+41 71 224 26 98
(Course Coding Challenge)

Hamed Hemati
ICS-HSG, Room: 61-500
hamed.hemati@unisg.ch
+41 71 224 27 09
(Main Contact, Communication)



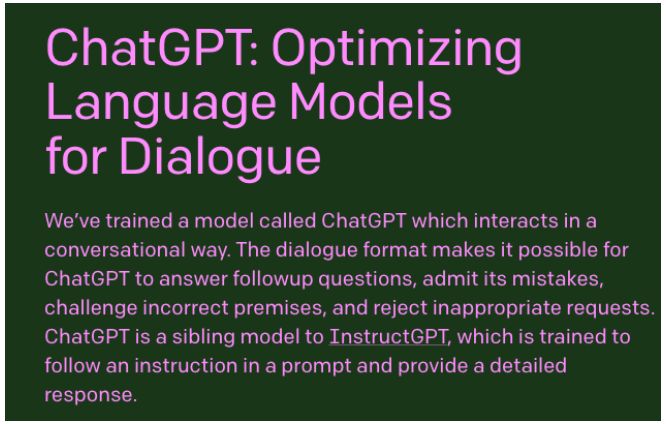
Shijun Wang
ICS-HSG, Room: 61-513
shijun.wang@unisg.ch
+41 71 224 73 70
(Main Contact, Communication)

Weekly Office hours: Thursdays 02:00 - 03:00 PM CEST (in-person and/or virtual)

Lab Objectives

- Thorough, Supplementary and Detailed
  - Learn and understand how to write and debug Python code.
  - Design, train and evaluate your own machine learning models.
- Practical and State of the Art
  - Demystify the theoretical concepts of the lecture.
  - Look at state of the art software tools, e.g., Jupyter notebooks.
- Research and Fun
  - Some materials cover new research of the past 1-3 years.
  - Coding is fun … this is a hands-on lab setup.

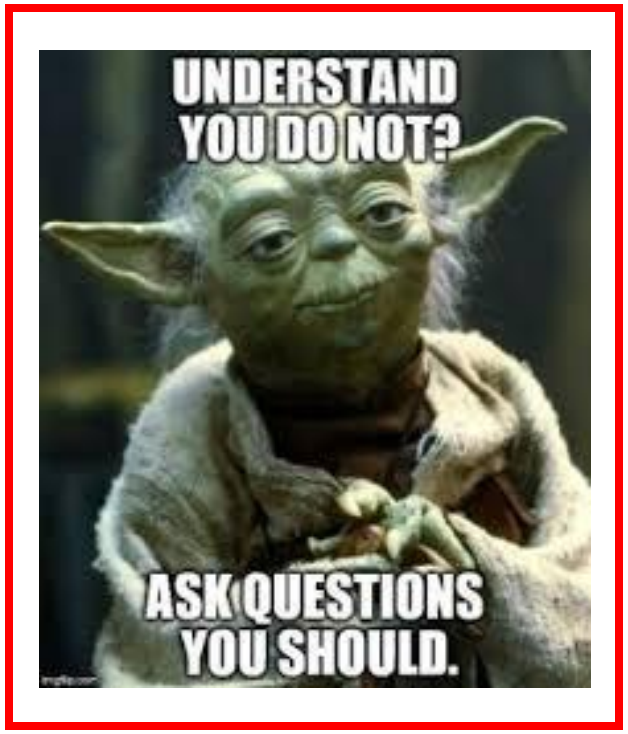
Source: https://openai.com/dall-e-2/



Source: https://openai.com/blog/chatgpt/

How to Contact Us

- Course Website on Canvas: https://learning.unisg.ch
  - For all course materials, slides, notebooks, etc.
- Course Discussion Forum:
  - Use this for most communication with course staff.
  - Ask questions about the assignments, grading, logistics, etc.
  - Communicate with your fellow students.
- E-Mail: aiml-teaching.ics@unisg.ch
  - Use this to schedule meetings with course staff.
  - Use this in case of private matters.



Course Participants Survey

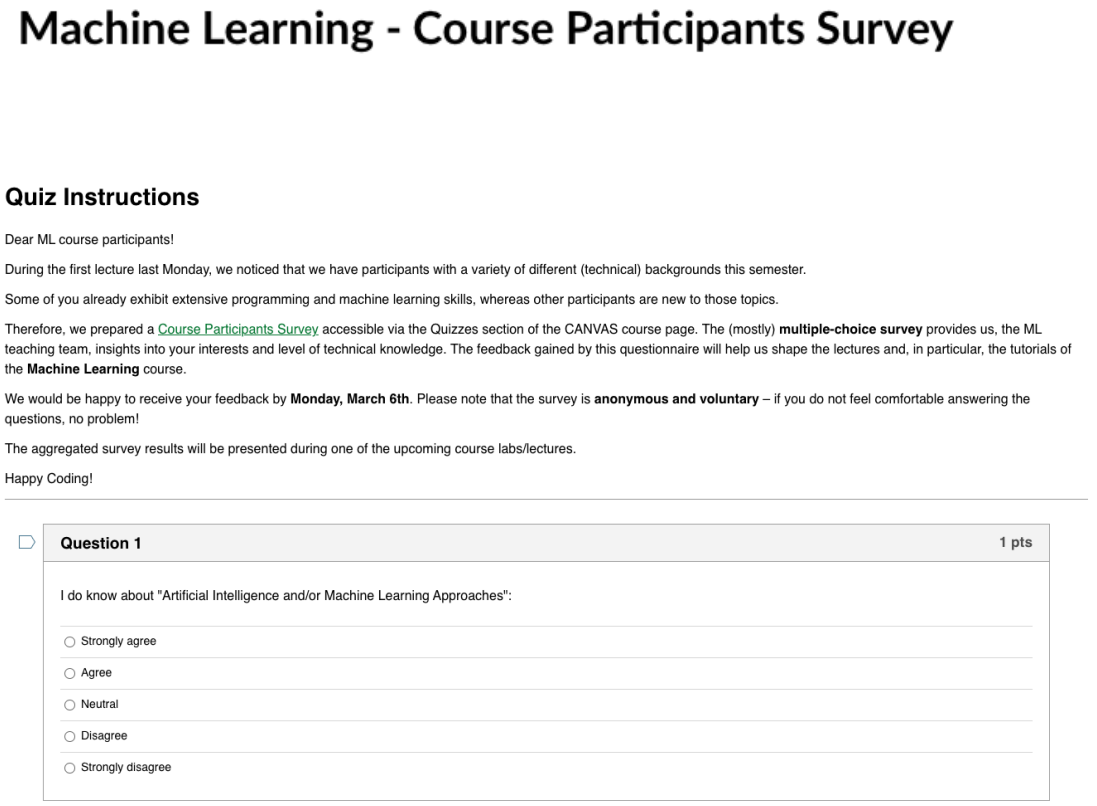
We have participants with a variety of different (technical) backgrounds this semester. Therefore, we launched a course survey that provides us, the ML teaching team, insights into your interests and level of technical knowledge.

We are happy to read your feedback! 

Available via the CANVAS course page:

https://learning.unisg.ch/courses/16612/quizzes/24234

Due date: Monday, March 6th



Machine Learning - Course Participants Survey

Quiz Instructions

Dear ML course participants!

During the first lecture last Monday, we noticed that we have participants with a variety of different (technical) backgrounds this semester.

Some of you already exhibit extensive programming and machine learning skills, whereas other participants are new to those topics.

Therefore, we prepared a Course Participants Survey accessible via the Quizzes section of the CANVAS course page. The (mostly) **multiple-choice survey** provides us, the ML teaching team, insights into your interests and level of technical knowledge. The feedback gained by this questionnaire will help us shape the lectures and, in particular, the tutorials of the **Machine Learning** course.

We would be happy to receive your feedback by **Monday, March 6th**. Please note that the survey is **anonymous and voluntary** – if you do not feel comfortable answering the questions, no problem!

The aggregated survey results will be presented during one of the upcoming course labs/lectures.

Happy Coding!

Question 1 — 1 pts

I do know about "Artificial Intelligence and/or Machine Learning Approaches":

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Course Logistics Updates

Weekly Updates and Questions

Course Labs and Challenge Roadmap

Event Type	Date	Description	Teaching Assistant	CC Phase
Lab 1	**20 Feb 2023**	**Co-Lab Introduction**	**Shijun**	**Introduction**
Lab 2	27 Feb 2023	**Support Vector Machine (SVM)**	Shijun	Ramp-Up Phase
CC 1	06 Mar 2023	**Coding Challenge - Kick-Off**	Linus	Coding Phase
Lab 3	13 Mar 2023	**Fully Connected Neural Networks**	Hamed	Ramp-Up Phase
Lab 4	20 Mar 2023	**Convolutional Neural Networks (CNNS)**	Hamed	Ramp-Up Phase
Lab 5	27 Mar 2023	**Long short-term memory (LSTM)**	Hamed	Ramp-Up Phase
Semester Break - Happy Easter!				

Course Labs and Challenge Roadmap

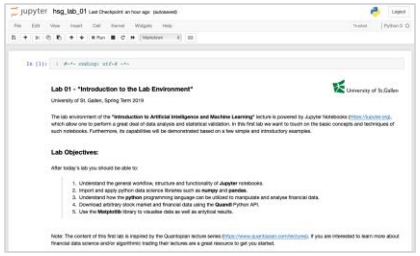
Event Type	Date	Description	Teaching Assistant	CC Phase
CC 2	17 Apr 2023	**Coding Challenge - Mid-Term**	Linus	Coding Phase
Lab 6	24 Apr 2023	**Attention**	Shijun	Coding Phase
Lab 7	01 May 2023	**K-Means, EM Clustering**	Shijun	Coding Phase
Lab 8	08 May 2023	**Autoencoder Anomaly Detection**	Hamed / Marco	Coding Phase
Lab 9	15 May 2023	**Transfer Learning / Self-Supervised Learning**	Shijun / Linus	Finalization Phase
CC 3	22 Mar 2023	**Coding Challenge - Submission**	Linus	Finalization Phase

Lab Environment

Python, Jupyter, Colab, Binder etc.

Let's jump into the lab notebook…

(1) Local Notebooks



https://localhost:8080

Prerequisite:
- Python installation
- Jupyter installation

(2) Colab Notebooks

Google

https://colab.research.google.com

Prerequisite:
- Google account
- Internet access

(3) Binder Notebooks

binder

Turn a Git repo into a collection of interactive notebooks

https://mybinder.org

Prerequisite:
- Internet access

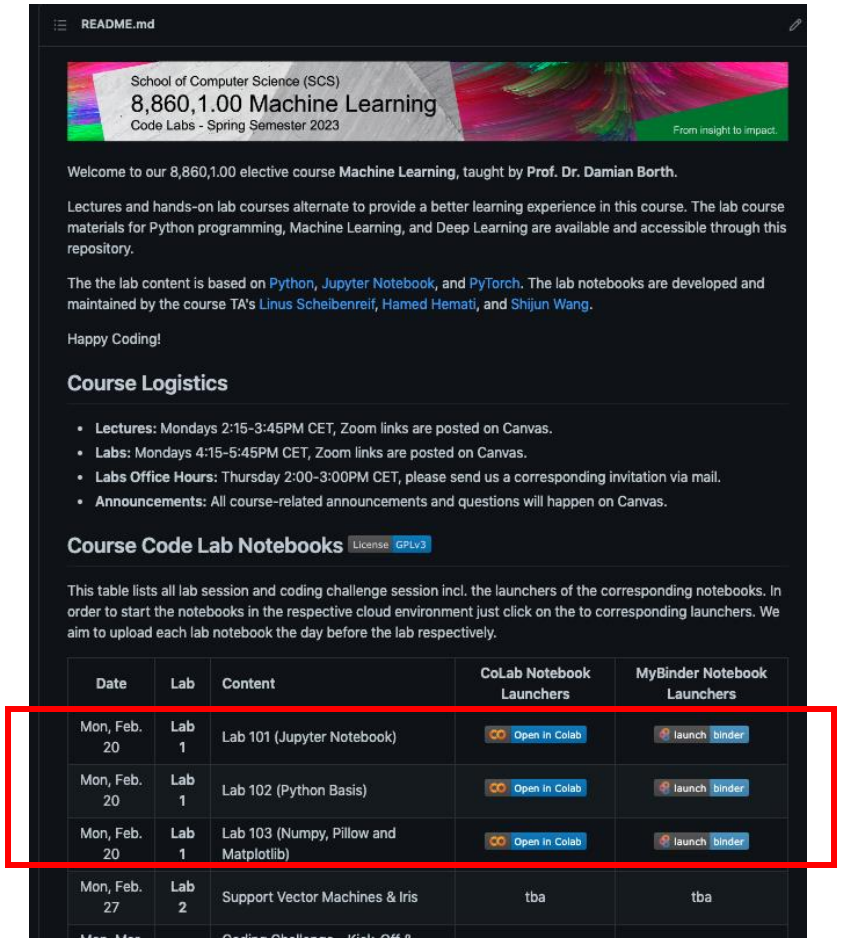
Accessing the Lab Notebooks

Course Code Repository

- Repository URL:

  https://github.com/HSG-AIML-Teaching/ML2023-Lab

- “GoTo” page for all course code examples!
- New lab notebooks will be published on a weekly basis as the lab evolves.
- Don’t hesitate to start, open code issues or submit a pull requests ☺


README.md

School of Computer Science (SCS)
8,860,1.00 Machine Learning
Code Labs - Spring Semester 2023
From insight to impact.

Welcome to our 8,860,1.00 elective course **Machine Learning**, taught by **Prof. Dr. Damian Borth**.

Lectures and hands-on lab courses alternate to provide a better learning experience in this course. The lab course materials for Python programming, Machine Learning, and Deep Learning are available and accessible through this repository.

The the lab content is based on Python, Jupyter Notebook, and PyTorch. The lab notebooks are developed and maintained by the course TA's Linus Scheibenreif, Hamed Hemati, and Shijun Wang.

Happy Coding!

Course Logistics

- **Lectures:** Mondays 2:15-3:45PM CET, Zoom links are posted on Canvas.
- **Labs:** Mondays 4:15-5:45PM CET, Zoom links are posted on Canvas.
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- **Announcements:** All course-related announcements and questions will happen on Canvas.

Course Code Lab Notebooks

License GPLv3

This table lists all lab session and coding challenge session incl. the launchers of the corresponding notebooks. In order to start the notebooks in the respective cloud environment just click on the to corresponding launchers. We aim to upload each lab notebook the day before the lab respectively.

Date	Lab	Content	CoLab Notebook Launchers	MyBinder Notebook Launchers
Mon, Feb. 20	Lab 1	Lab 101 (Jupyter Notebook)	Open in Colab	launch binder
Mon, Feb. 20	Lab 1	Lab 102 (Python Basis)	Open in Colab	launch binder
Mon, Feb. 20	Lab 1	Lab 103 (Numpy, Pillow and Matplotlib)	Open in Colab	launch binder
Mon, Feb. 27	Lab 2	Support Vector Machines & Iris	tba	tba

Accessing the Lab Notebooks

Code Labs & Notebooks

Lab courses take place approximately **every Monday, 16:15 to 17:45 CEST** in-person in the same room as the lecture.

Please note, that all course Jupyter Notebooks can be obtained from the course GitHub code repository and will run in the Binder or Colab cloud. Alternatively, Notebooks can also be run locally on your own computer.

Event Type	Date	Topic Area	Description	Slides and Notebooks
Lab 1	20th Feb. 2023	Introduction	**Python and Jupyter Notebook Setup** • Jupyter Notebook introduction (Lab 101) • Python, Numpy, Pillow introduction (Lab 102) • Pandas, Pillow, Matplotlib introduction (Lab 103)	**Test and Introduction Notebooks on GitHub:** https://github.com/HSG-AIML-Teaching/ML2023-Lab (see Lab 101, 102, and 103)
Lab 2	27th Feb. 2023	Support Vector Machines	**Support Vector Machines (SVM)** • Separating Hyperplanes • HoG Features • Iris and MNIST Dataset	**Slides:** • TBA **Notebook:** • Support Vector Machines Notebook [Colab] [Binder]

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Mon, Feb. 27	Lab 2	Support Vector Machines & Iris	tba	tba

Lab Github Repo of Code & Notebooks: https://github.com/HSG-AIML-Teaching/ML2023-Lab

Happy Coding!

Artificial Intelligence
and Machine Learning
Universität St.Gallen

CS Machine Learning Class of Spring 2023

Chair of Artificial Intelligence
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aiml-teaching.ics@unisg.ch