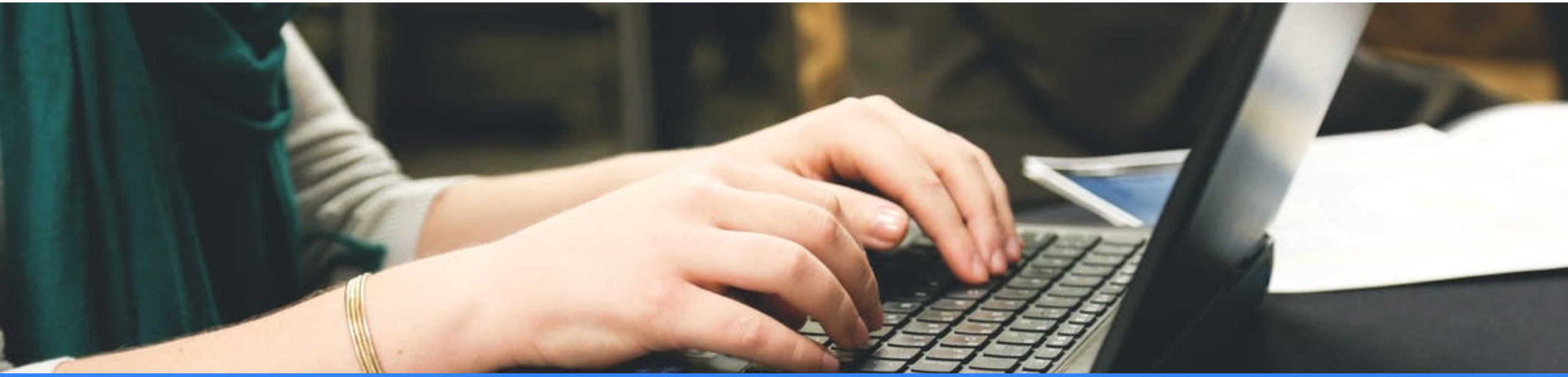


Practical Machine Learning

Organization

Sven Mayer

Team

Sven Mayer

Jesse Grootjen

Maximiliane Windl

Organization

- **Lecture**: Thursday 10-12 c.t., Zoom
- **Tutorials:** Fridays 10-12 c.t., Zoom
- **Location:** Pettenkoferstr. 14, KI. HS Physiologie (F1.08)
- **Practical projects**: one (iteration of a) practical project over the course of the lecture; intermediate presentations in the tutorials and final presentation at the end of the lecture

Organization

- **Uni2Work course** (course organization and news):
  - https://uni2work.ifi.lmu.de/course/S22/IfI/PML
- **Website** http://www.medien.ifi.lmu.de/lehre/ss22/pml/
- **Recordings & Slides** https://sven-mayer.com/pml
- **Discord** (see Uni2Work)
- **Email** pml@medien.ifi.lmu.de

Recorded Lecture

- The materials are online available via
  - https://sven-mayer.com/pml/
  - Watch the lecture recording before the lecture
  - Videos 20min to 1h
- In the lecture slot (Thursdays, 10-12) we will discuss the content
  - No playback of the recorded lecture materials
  - Discussion lectures will be every two weeks
  - Watch the videos, have questions, and engage in the discussion

Organization

Hands-On Sessions

- Examples will be based on
  - Python 3.9
  - Keras + Tensoflow
  - Jupyter Notebooks recommended

You will get all information in the first tutorial.

- Get started:
  - https://www.python.org/
  - https://www.tensorflow.org/install
  - https://jupyter.org/
  - For Windows users: https://www.lfd.uci.edu/~gohlke/pythonlibs/

Exam

- The exam will consist of two parts
- Your practical project including the final presentation (1/2 of the final grade)
- An oral exam of 10 minutes about the content of the lectures, exercises, and project (1/2 of the final grade)
- Note: You have to pass both parts individually. To pass overall.

- This lecture has 6 ETCS which is equivalent to 180h of work

Exam

Oral

- 10 minutes oral exam in the semester break
- Oral exams will be in person
- Dates: TBA

Exam

Projects

- Groups of 3-5 students

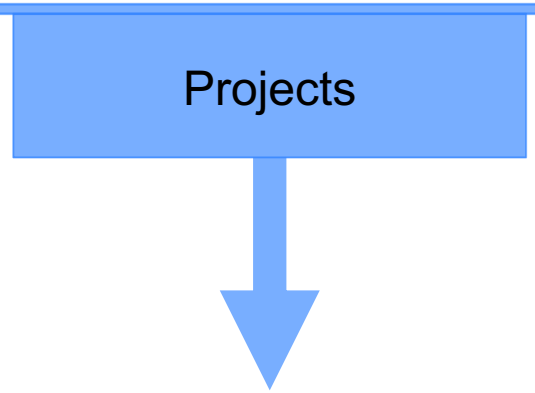
- 10 min presentation at the end of the semester
  - During the Lecture and tutorial slot
- Submit in your code and materials via Uni2Work
- “Statement of Contribution” max 2 page
  - to represent the contribution of all parties

Lectures

- 28.04.2022 Lecture 01: Organization & Introduction
- 05.05.2022 Lecture 02: Supervised vs. Unsupervised Learning & Lecture 03: Full Practical Neural Network Walkthrough
- 12.05.2022 canceled
- 19.05.2022 Lecture 04: Introduction Neural Networks & Lecture 05: Advanced Neural Networks
- 26.05.2022 canceled - public holiday
- 02.06.2022 Lecture 06: Evaluating Neural Networks & Lecture 07: Trainings Strategies
- 09.06.2022 Lecture 08: Recurrent Neural Network (RNN) & Long Short-Term Memory (LSTM)
- 16.06.2022 canceled - public holiday
- 23.06.2022 Lecture 09: Generative Adversarial Networks (GANs)
- 30.06.2022 Lecture 10: Reinforcement Learning
- 07.07.2022 Lecture 11: TBA
- 14.07.2022 canceled
- 21.07.2022 Open Discussion
- 28.07.2022 Final Presentation

Tutorials

- 06.05.2022 Organization & Exercise 01: Recording your own data (2 weeks)
- 13.05.2022 Live Coding Session: Getting Started with Neuronal Networks
- 20.05.2022 Live Coding Session: Deploying Models to Mobile Devices (Android) & Exercise 02: Clearing your data and training the first model (2 weeks)
- 27.05.2022 canceled
- 03.06.2022 Project Ideation & Exercise 03: Training an improved model based on a large dataset (1 weeks)
- 10.06.2022 Project Pitches: Show Current Project Status
- 17.06.2022 Individual Help for Projects
- 24.06.2022 Individual Help for Projects
- 01.07.2022 Individual Help for Projects
- 08.07.2022 Individual Help for Projects
- 15.07.2022 canceled
- 22.07.2022 How to give a great project presentation & Q'n'A: Exam preparation &Individual Help for Projects
- 29.07.2022 Final Presentation



Projects

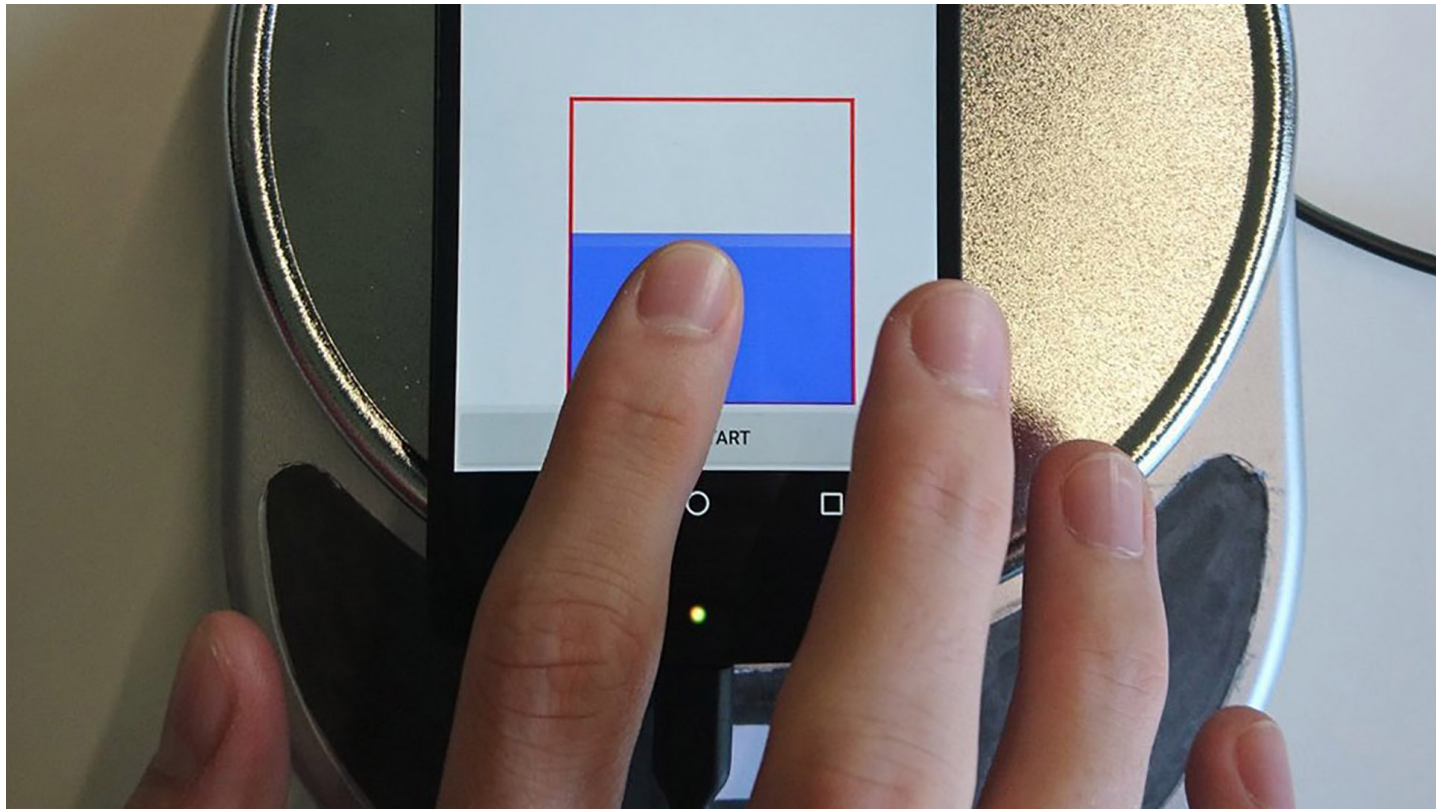
Goals

- The goal is to apply machine learning in the context of human-computer interaction
- Be creative – think about sensors, e.g., IMU, camera, EEG
- Do not try to improve on existing systems

- Recording enough data for ML is hard
- Preexisting datasets can help

Projects Outcomes

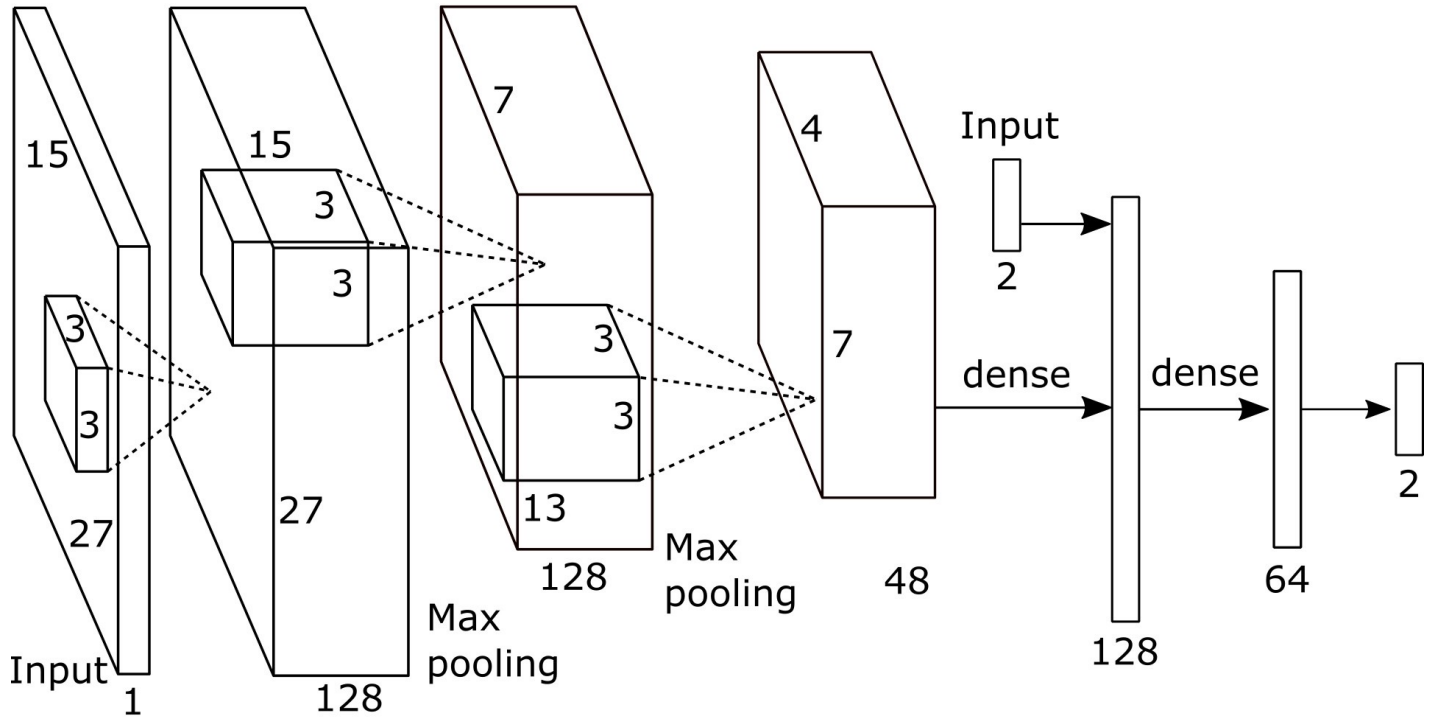
Force Touch Detection on Capacitive Sensors using Deep Neural Networks



Tobias Boceck, Sascha Sprott, Huy Viet Le, and Sven Mayer. 2019. Force Touch Detection on Capacitive Sensors using Deep Neural Networks. In Procc of MobileHCI ‘19. ACM. DOI: https://doi.org/10.1145/3338286.3344389

Projects Outcomes

Improving the Input Accuracy of Touchscreens using Deep Learning



Abinaya Kumar, Aishwarya Radjesh, Sven Mayer, and Huy Viet Le. 2019. Improving the Input Accuracy of Touchscreens using Deep Learning. In *CHI EA '19*. ACM. DOI: https://doi.org/10.1145/3290607.3312928

Projects Outcomes

KnuckleTouch: Enabling Knuckle Gestures on Capacitive Touchscreens using Deep Learning

University of Stuttgart
Germany

KnuckleTouch: Enabling Knuckle Gestures on Capacitive Touchscreens using Deep Learning

Robin Schweigert, Jan Leusmann, Simon Hagenmayer, Maximilian Weiß,
Huy Viet Le, Sven Mayer, Andreas Bulling

Robin Schweigert, Jan Leusmann, Simon Hagenmayer, Maximilian Weiß, Huy Viet Le, Sven Mayer, and Andreas Bulling. 2019. KnuckleTouch: Enabling Knuckle Gestures on Capacitive Touchscreens using Deep Learning. In Proceedings of MuC'19. ACM, New York, NY, USA, 387–397. DOI: https://doi.org/10.1145/3340764.3340767

Questions?

License