# Winter term 2020/21 – Topics for
NEIDI   (MSc),
Project (BSc) &
KSWS   (BSc)

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Mobile Multimedia Information Systems

Topic Descriptions

Detection of little wooden blocks

- Recommended Requirements:

  – experience with image / video processing

- Tasks:

  – realise a camera setup and analysis system which recognises the position and state (lying, standing, …) of multiple wooden blocks

  – realtime capable – analysing video streams

  – robust – must work under various conditions:

    – different background

    – different lighting conditions

    – hands
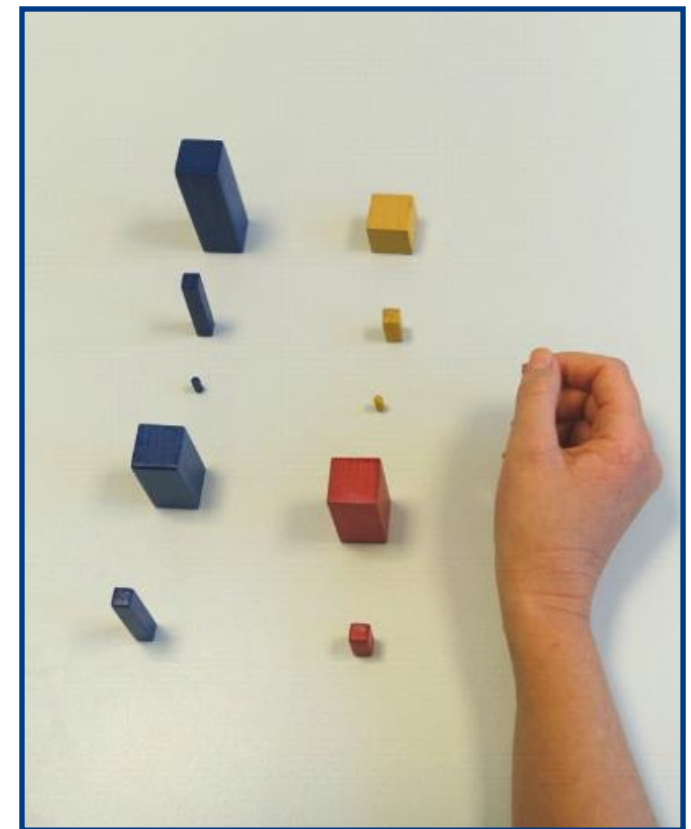
Detection of plastic jars

- Recommended Requirements:

  – experience with image / video processing

  – experience with analog sensors (e.g., weighing scales)

- Tasks:

  – realise a sensor setup and analysis system which recognises the position and state (single jar, stacked, …) of different size jars

  – realtime capable – analysing data streams

  – robust – must work under various conditions

Facial / Emotional Recognition of people using image processing

- Recommended Requirements

  – Experience with image/video processing

- Tasks

  – Realise camera setup and analysis which system recognise emotions

  – Find dataset. Determine with what accuracy they perform.

  – Real-time capable and on a video streamPerformance metrics on real time analysis

  – Robust- must work under various background

- Links:

  – https://github.com/JingchunCheng/All-Age-Faces-Dataset

  – https://www.sciencedirect.com/science/article/abs/pii/S1566253517307066

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Rule-Extraction from Neural Networks

- Recommended requirements:
  - Experience with training neural networks using Keras

- Task:
  - current validation / self-explanation approaches for neural networks are usually based on visualisations of the input-output-behaviour
  - this might be misleading as exemplified in the figure
  - rule-extraction methods shall be investigated and compared
  - a suitable test-bed shall be defined and existing algorithms be evaluated
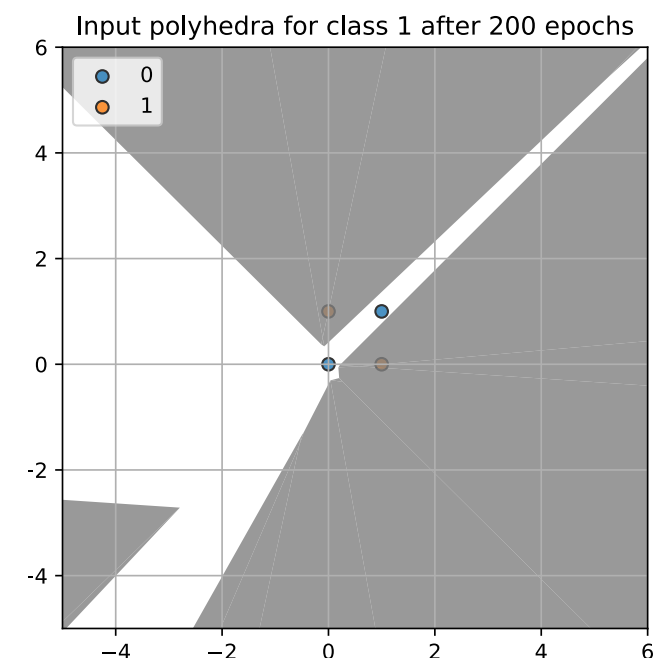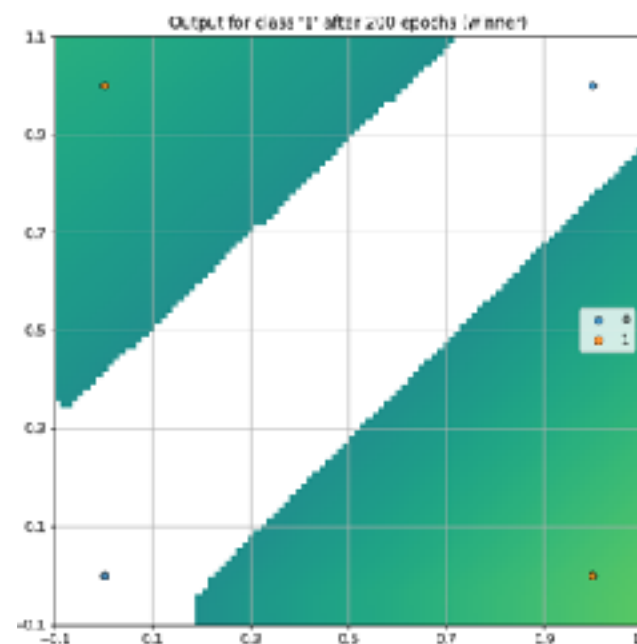
Automatic Machine Learning using AutoKeras

- Investigate options and potentials of automatic model development using AutoKeras

- Identify different application scenarios
  (in close cooperation with supervisor)

- Compare the current state of the art solution to identified application scenarios and automatic solutions

Time-Series Processing using Neural Networks

- Investigate current state of the art systems to process time-series data

  – data from mobile sensors for behaviour recognition

  – Bluetooth Low Energy readings for localisation

- Performance evaluation of different systems

  – define suitable evaluation metrics for each application domain

  – compare performance of systems

Schedule / Organisation

Schedule

- from 2nd Nov.   Register in StudIP-Groups

- until 13th Nov.   Meeting with supervisor

- until 27th Nov.   MS1) Requirements

  – Hint: register officially for the exam only after a successful MS1!

- until 18th Dec.   MS2) Intermediate defence

- until 15th Jan.   MS3) Concept

- until 12th Feb.   MS4) Functional prototype

- until End of Feb.   MS5) Presentation / Defence

MS1) Requirements

- for KSWS-students: Lastenheft

- Questions to be answered

  - Which components are involved

  - How do they interact

  - Specification of functions etc

  - Detailed milestones for your project!

    - Should be realistic!

    - What happens if …?

- Hint: register for the exam only after a successful MS1

MS2) Intermediate defence

- 15' Presentation

- Questions to be answered

  – Goal of the project

  – Team members

  – Functions / modules to be realised

  – Schedule

MS3) Concept

- Questions to be answered
  - Redefined Milestones
  - Licence model
  - For KSWS: Pflichtenheft

MS4) Functional prototype

- Running prototype which satisfies all requirements

- Platform independent

- Runnable on MMIS-machines!

MS5) Defence

- Project presentation:

  – Overall presentation of your project

- For NEIDI-Students:

  – What is my specialisation?

  – Presentation about technical details

Organisation

Git Repository

- Will be created by supervisor

- You need a login for the department of computer science:

  https://www.informatik.uni-rostock.de/en/it-service/information/user-account/

- Once you got the login, go to

 https://git.informatik.uni-rostock.de/

- After logging in there, please send your login to your supervisor

Time sheets

- KSWS, NEIDI, Project are all 6 credit worth
  - i.e., 180h during the semester
  - for a duration of approx. 15 weeks, 12h/week!

- For each team member, there should be a time sheet within the GIT (stored as csv-file!), reporting about the efforts with a granularity of 1h

```
Date, Hours, Topic, Details
2019-10-28, 1, meet, initial meeting
```
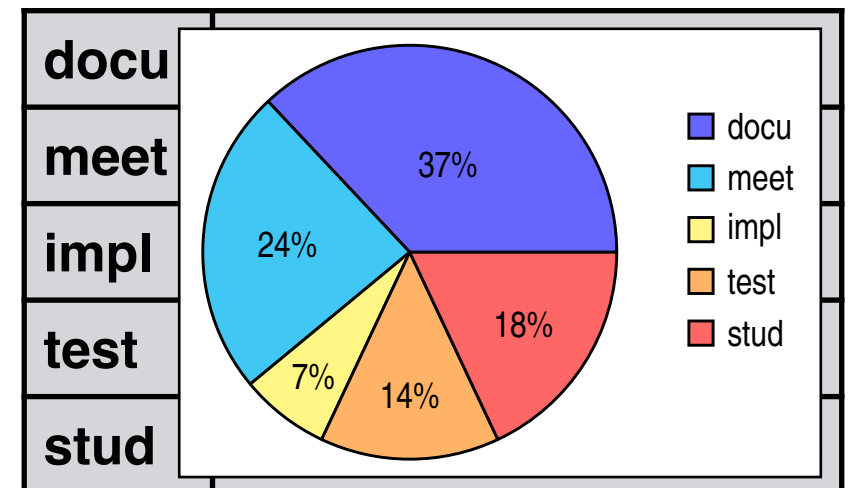

- Timesheets reporting about day *d* should be submitted not later than *d+7*