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

Sebastian Bader
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

Contact: syed.zafar@uni-rostock.de
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

Contact: syed.zafar@uni-rostock.de
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 stream Performance metrics on real time analysis
  - Robust- must work under various background

• **Links:**
  - https://github.com/JingchunCheng/All-Age-Faces-Dataset

Contact: syed.zafar@uni-rostock.de
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

Contact: sebastian.bader@uni-rostock.de
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

Contact: sebastian.bader@uni-rostock.de
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

Contact: sebastian.bader@uni-rostock.de
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

<table>
<thead>
<tr>
<th>Date, Hours, Topic, Details</th>
</tr>
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<tbody>
<tr>
<td>2019-10-28, 1, meet, initial meeting</td>
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• Timesheets reporting about day $d$ should be submitted not later than $d+7$