University of Zurich[UZH]

Department of Geography

Crowdsourced Rainfall Intensity Measurements

GEO 401: Integrative Project 2016/2017

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Content

- Motivation
- Research
- Results
- Conclusion

Motivation

Motivation

Criteria for our topic

- Crowd-sourced data acquisition adds additional possibilities in comparison with traditional techniques
- Should deliver enough data for extensive statistics
- → **rainfall intensity**

Lead questions which can be answered specifically through crowdsourcing

- How do people estimate rainfall intensity?
- Is understanding of rainfall intensity subjective?
- Possibility of an objective scale?
- Higher temporal resolution?

Research

Research

- Classification System

(CrowdWater 2016, Rinderer et al. 2012)

- Meteo Station

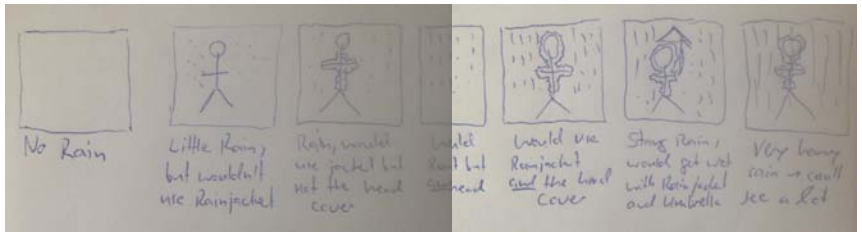
Research Questions

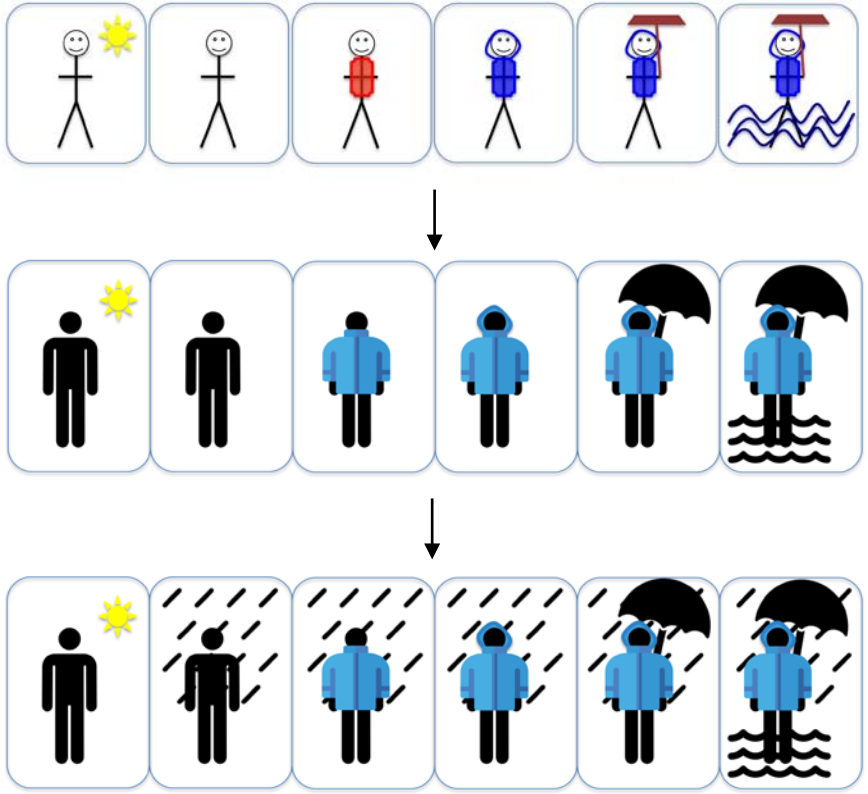
1. *How is rainfall intensity perceived by citizen scientists (mainly students)?*

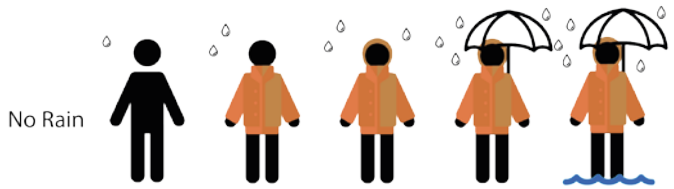
2. *Is it possible to estimate rainfall intensity with a qualitative class system?*

3. *NEW: Is it possible to detect short term variability in rainfall intensities with crowd classifications?*

Creation of the Classification Icons

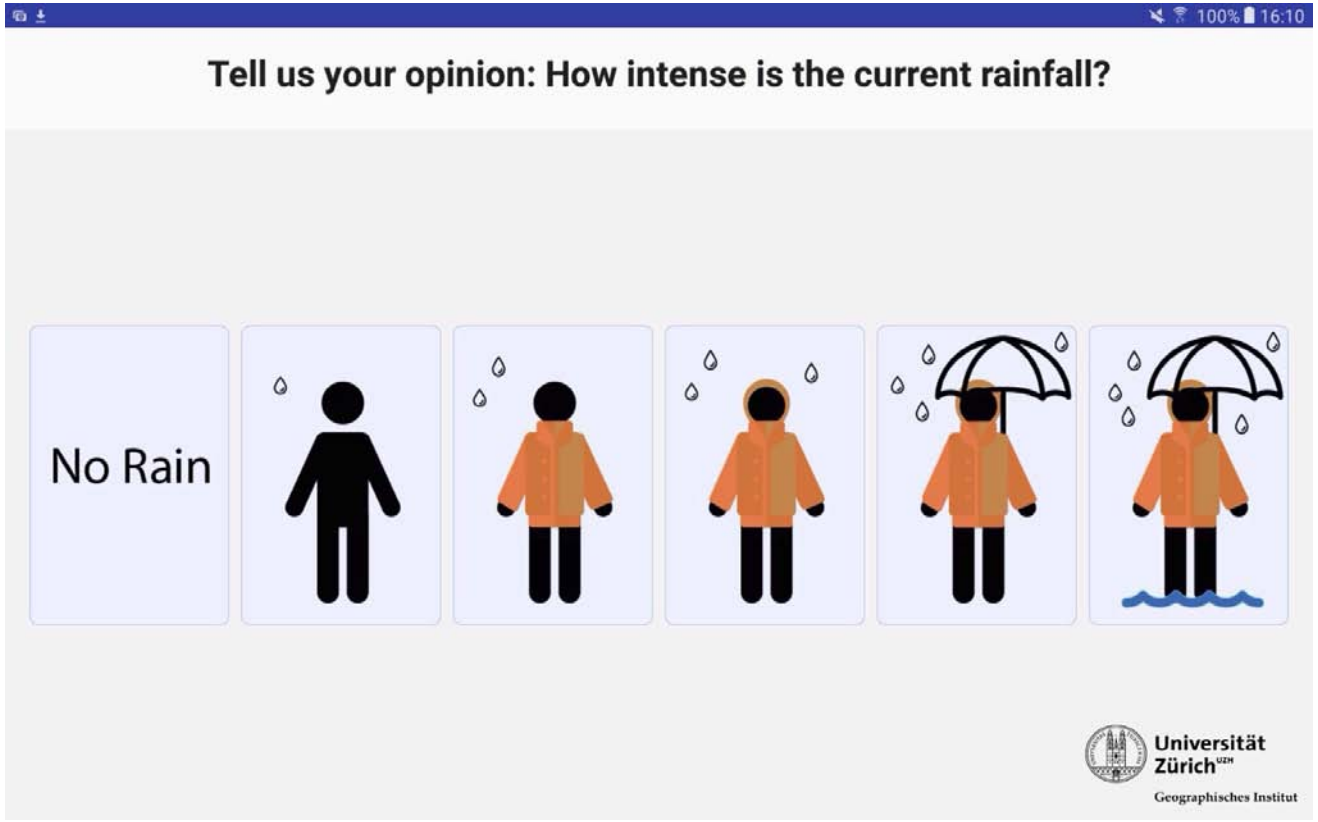






Final Classification Systems

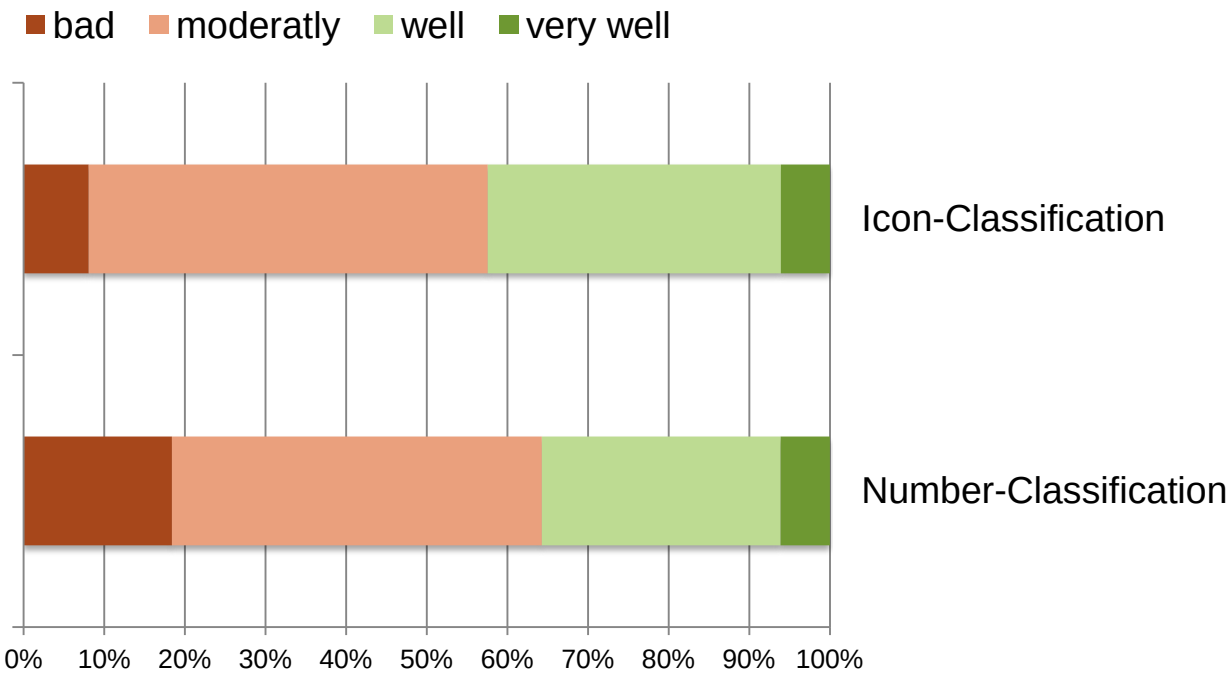
App on Tablet



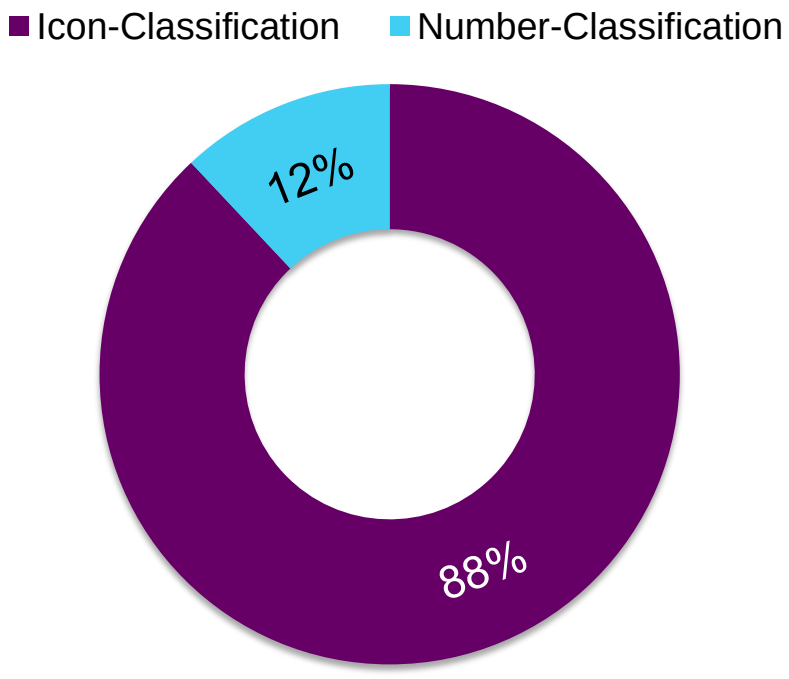
Results

Lecture Survey – different classification systems

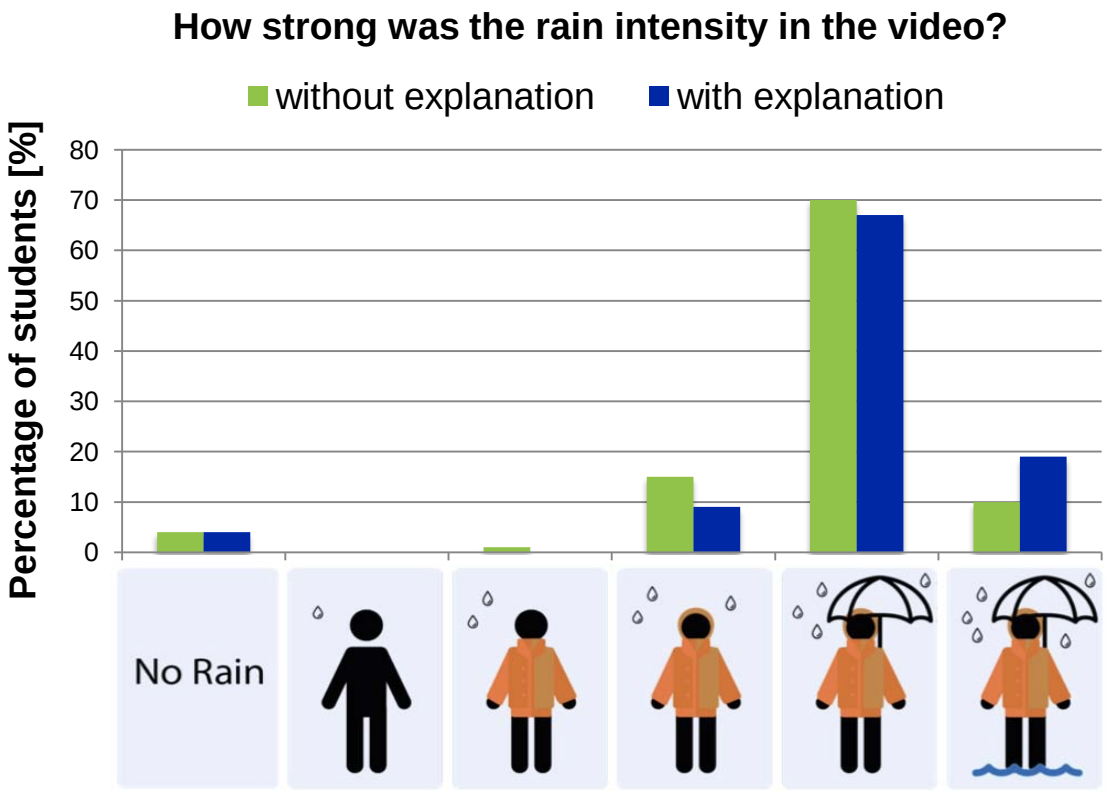
How well did you feel able to estimate the rain intensity with this classification?

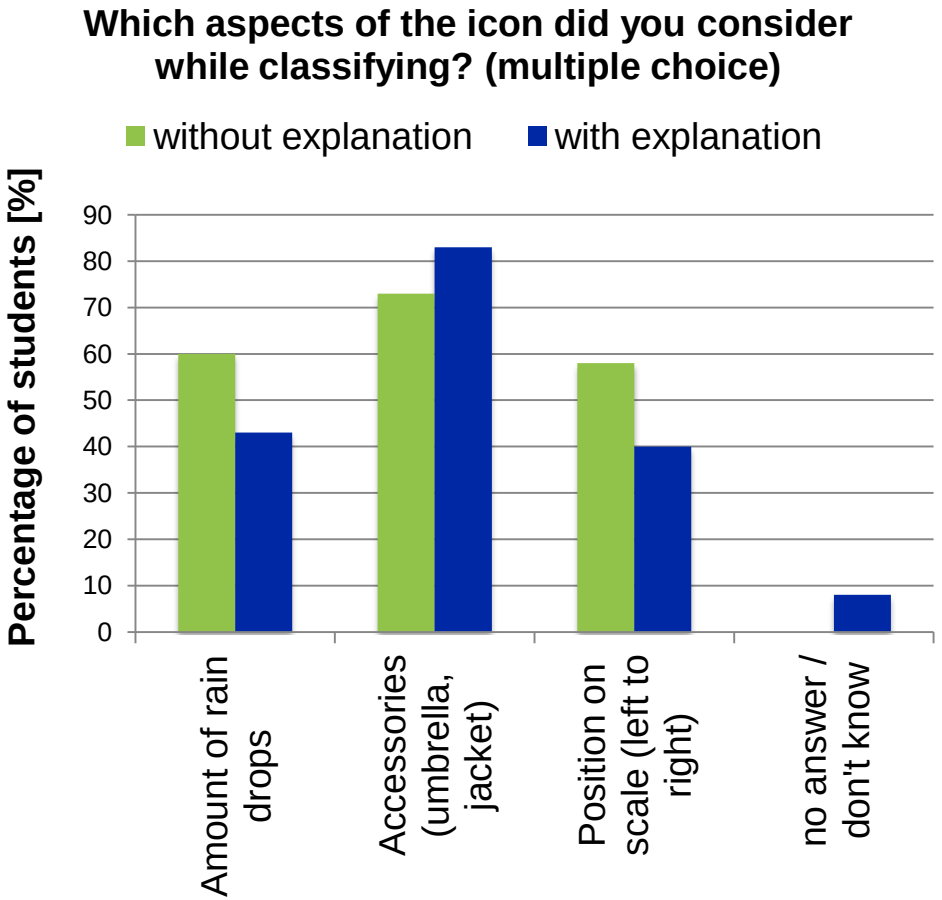


Which of the two classification systems is easier to interpret?

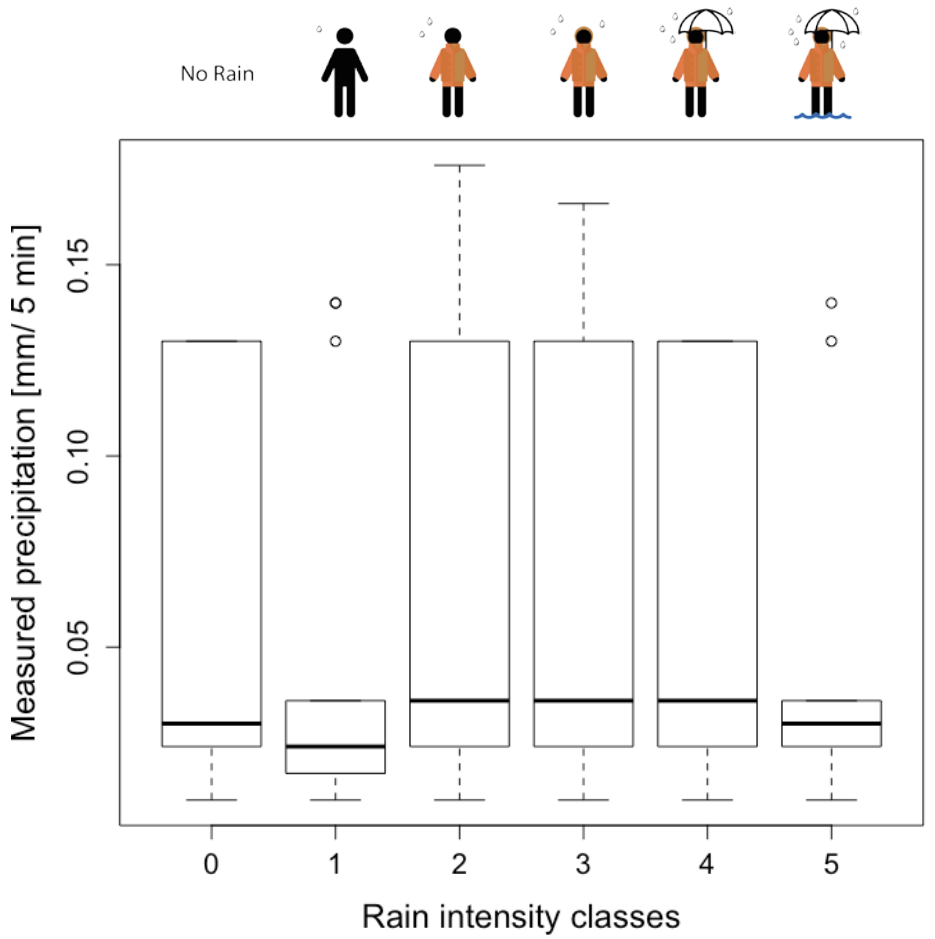


Lecture Survey – the influence of explanations of the icons

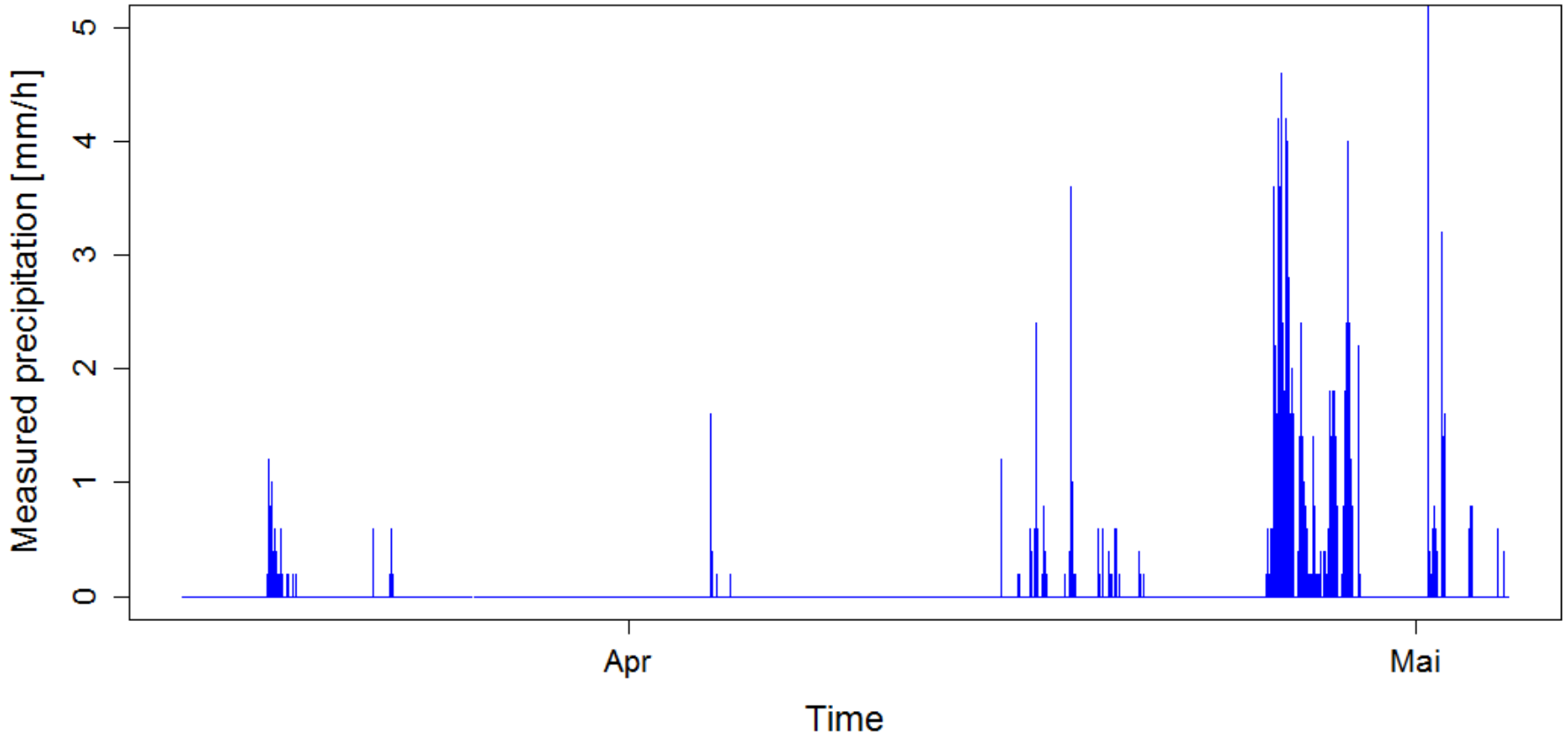




Tablet vs. Measured Rainfall



Precipitation Timeseries 2017, Irchel



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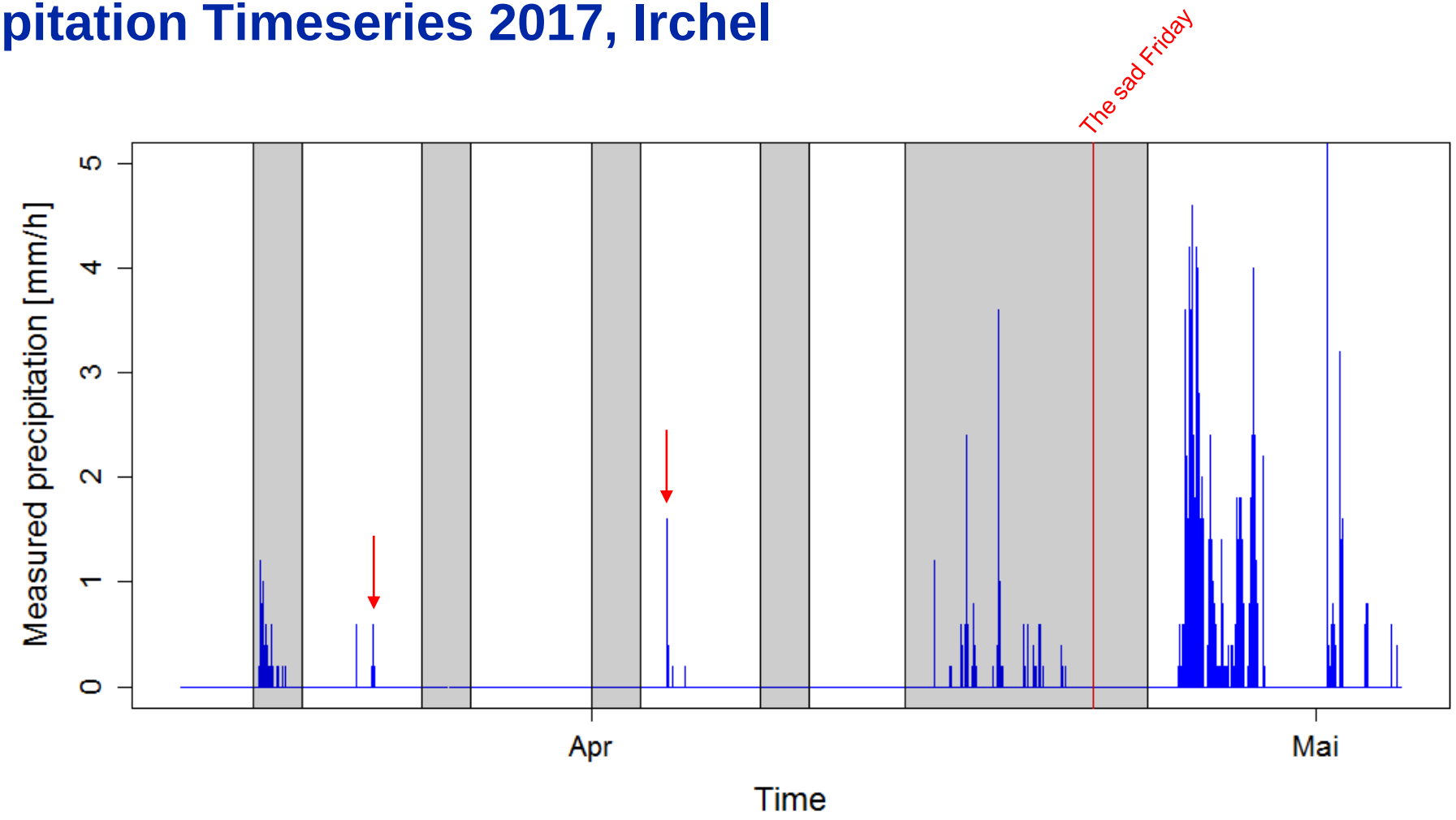
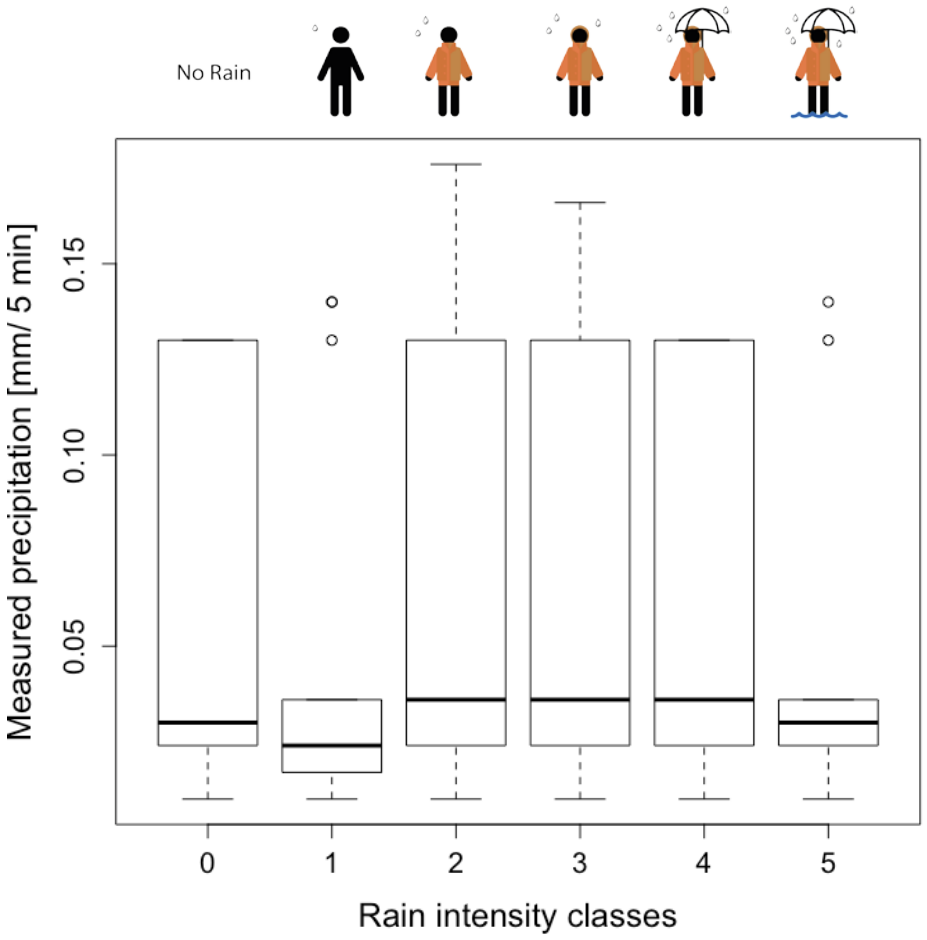
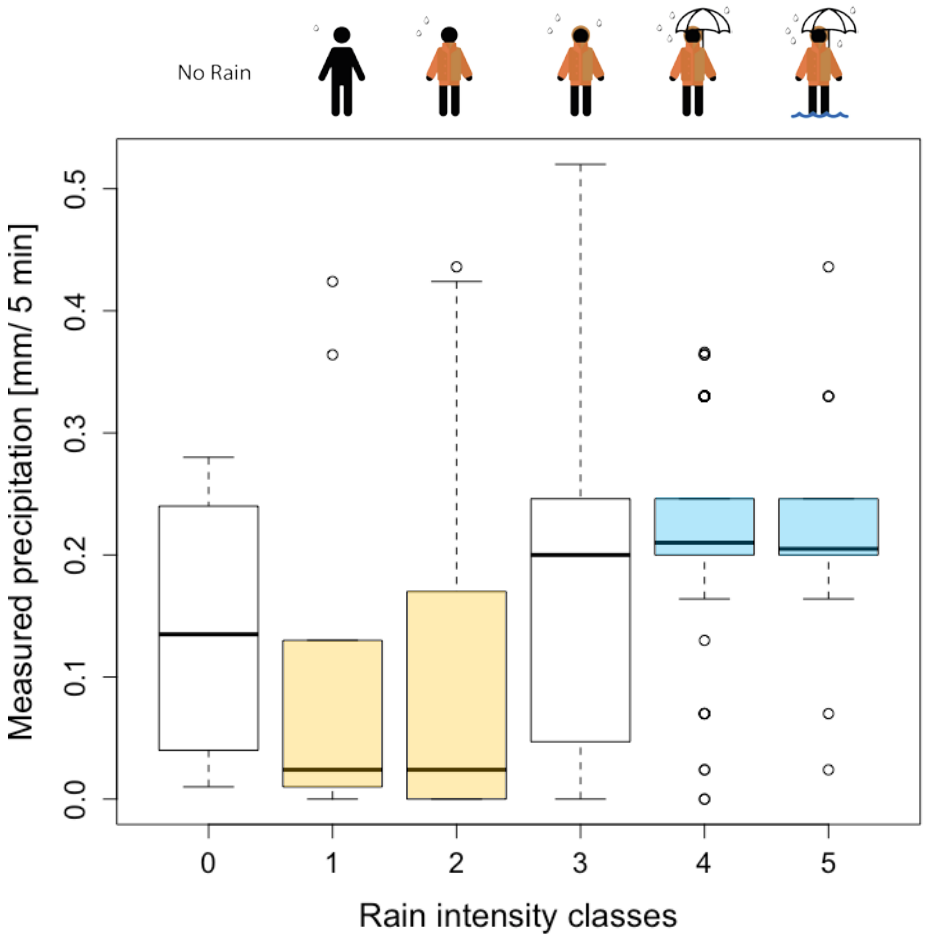


Tablet

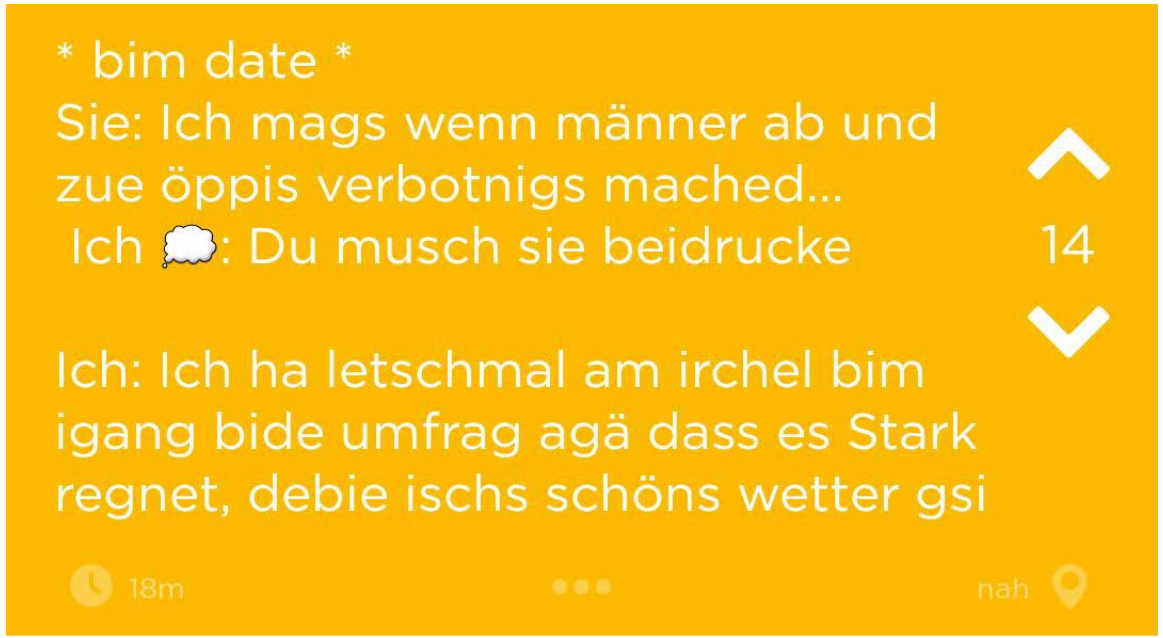


Field Survey



Errors: Misclassifications

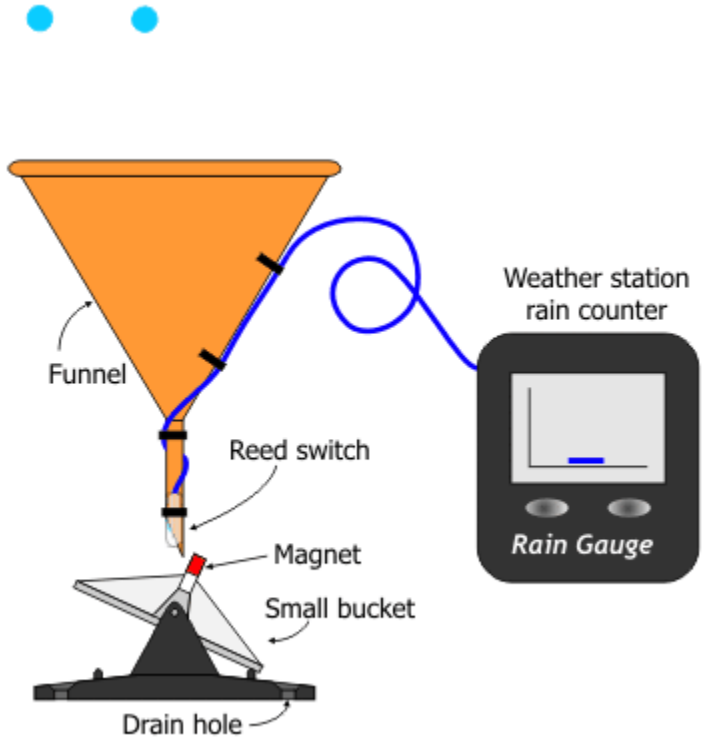
jodel The buzz on your campus.



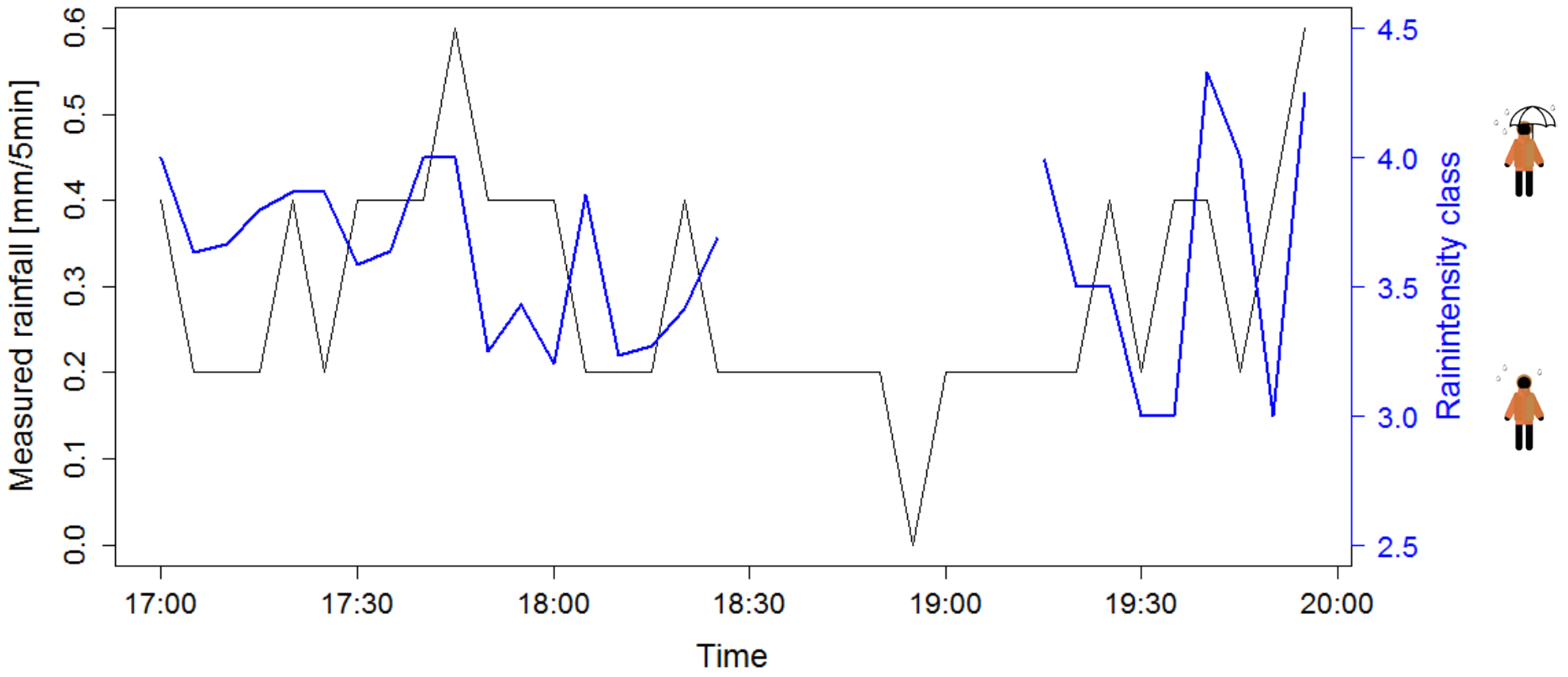
Errors: Misclassifications

	votes with rain but no rain measured	total votes	relative amount [%]
Tablet:	1381	3857	36
Field Survey:	86	304	28

Errors: Tipping Bucket Raingauge



Timeseries: Field Survey vs. Measured Rainfall



Conclusion

Conclusion

1. *How is rainfall intensity perceived by citizen scientists (mainly students)?*
   - Distinction of different intensities is possible
   - But only rough categories (no, little, intense rain)

2. *Is it possible to estimate rainfall intensity with a qualitative class system?*
   - Yes, but there are a few limitations:
     - Problems with high temporal resolution
     - Misclassifications

3. *NEW: Is it possible to detect short term variabilities in rainfall intensities with crowd classifications?*
   – No, the variability of the survey data seems to be too large

Sources

Literature:

– Rinderer M., Kollegger A., Fischer B. M. C., Stähli M., Seibert J. (2012). Sensing with boots and trousers – qualitative field observations of shallow soil moisture patterns. Hydrological Press. 26, 4112-4120. DOI: 10,1002/hyp.9531

Internet:

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– CrowdWater: http://www.crowdwater.ch/de/TheProject.html
– Rain Gauge: https://giphy.com/gifs/instrument-AsFbniBeEbecU
– Jodel: http://p3.zdassets.com/hc/settings_assets/918644/200144035/xZ99Au3n7pXExdJxCpXqyg-jodel-logo-orange.png
– Jodel: https://jodel-app.com/#

Questions