Commercial Microwave Links in Sri Lanka as a precipitation source using Deep Transfer Learning

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1 Problem description

Remove text from this template and write your own (of course). Feel free to change headers, but make sure the topics are covered. There is a lot of valuable information available on the internet on how to write thesis proposals and the thesis reports themselves.

In this Section, you should:

- Motivate and justify the research. Put your research in global context (who cares about your research?)
- State what has been done already. Summarize relevant literature (Overeem, Leijnse, & Uijlenhoet, 2011).
- State what has NOT been done yet. Where is the gap in knowledge? This should lead directly to the research objectives in the next Section.

2 Research objectives

State objectives clearly. What is the point of this research? The aim should follow directly from the problem description. The objectives of this research are to 1) train, test and validate a neural network on CML data obtained in the Netherlands, 2) use transfer learning to

3 Research questions

Which questions do you want to answer in order to reach the objectives? Divide into sub-questions for clarity.

- How does a neural network perform on Dutch data?
- How does transfer learning improve the use of CML's in Sri Lanka as precipitation measurements?
- What is the potential of the use of NN for 2D interpolation of rainfall maps

4 Field site and data

Are you going to use other people's data or collect data yourself? What are the considered locations, instruments, resolutions? You can also include the data in the methods.

5 Methods

How are you going to find the answer to your questions? What do you need for this? Describe the core measurement equipment or models briefly. It often helps to link the steps in the methodology to the research questions.

6 Timetable

Adapt the Table below to make it specific for your project (or make your own). Set deadlines for the products. Be as specific as possible: mention when you will collect which data /do which model runs / write which parts of the report. It often helps to link activities and products to your sub-questions. A specific planning can help later on to see if you are on schedule or that you should e.g. shorten a certain data-processing step or stop calibrating your model, so you have enough time to do the analyses and answer your research questions. It often helps to link the tasks to the methodology (and therefore to the research questions). Specify special conditions: are you planning to take courses, vacation, etc.

References

Overeem, A., Leijnse, H., & Uijlenhoet, R. (2011). Measuring urban rainfall using microwave links from commercial cellular communication networks [Journal Article]. *Water Resources Research*, *47*(12). Retrieved from https://agupubs.onlinelibrary.wiley.com/doi/abs/10.
doi: https://doi.org/10.1029/2010WR010350

Table 1: Schedule of the project.