Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2019-412-RC2, 2020

Atmospheric Measurement Techniques Discussions

Interactive comment on "Rain event detection in commercial microwave link attenuation data using convolutional neural networks" *by* Julius Polz et al.

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Received and published: 3 February 2020

* General

The manuscript describes the application of a one-dimensional convolutional neuronal network (CNN) to classify wet and dry periods based on microwave link attenuation data. The CNN is compared against a very simple classification scheme that is only based on the standard deviation of the signal. Not surprisingly, the CNN performed better.

The manuscript is well written and the underlying work seems solid. Still, in my opin-

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Discussion paper

ion, this paper lacks ambition and innovation to deserve a publication in AMT. As the authors mention, various ANN's and other machine learning techniques have previously been applied in different settings on MWL data. Also the whet/dry classification problem does not appear particulary challenging from a machine learning perspective. Furthermore, for time-series data recurrent neuronal network architectures (e.g. LSTM) seem a more obvious choice (which could be combined with convolution layers if needed).

A more interesting question would be to investigate if we can train a ANN to predict the rainfall intensities directly, and so avoid all submodels for baseline estimation, wet antenna correction, and so on. Such a model could also make use of additional information, like MWL properties, frequency, maybe temperature, ...

A good transferability of the trained model to a region with different climate is key for an application where no reference data are available (such as in the mentioned Burkina Faso). This could have been partly emulated by training the model in one region and then validating it in a region with different climate. Or by training the model in winter and validating it in summer.

I'm sure the current work offers the authors a solid foundation for more ambitious investigations.

* Specific points

L 90: "...it has to be proven that artificial neural networks allow for high-performance, fast and robust processing of large data sets..." - I think this is already proven by countless other application.

L 145: Besides the attenuation data for the hour to classify, the Network was also feed with the two hours of "old" data. Did this improve the classification? If yes, it would indicate that attenuation data have some kin of memory effect (antenna wetting?).

L185: Where did you add the dropout layers? How many?

L216: Are TP, FP, FN, and TN defined?

L230: What is the advantage of the MCC compared to the ROC?

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-412, 2019.