Analysis of crowd-sourced hail reports in Switzerland

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The MeteoSwiss smartphone application allows phone users to send reports on hailstorms, containing information about hail size, time and location of an event, as well as some anonymized information about the sender. More than 50,000 reports have been submitted since the year 2015.

These reports can be validated using MeteoSwiss radar data and independent ground observations. It is known that the majority of submitted hail reports are either faked or biased. Currently the crowd-sourced hail data are only used as supplement to radar- and ground-based observations.

The goal of the proposed project is to learn to discriminate false and valid messages and to learn to identify hailstorms, using only crowd-sourced data. A real haistorm in densely populated parts of Switzerland will presumably generate a number of hail reports, forming distinctive spatial and temporal patterns. Discrimination of false reports and identification of real hailstorms can probably be achieved by discovering and recognising these patterns, using a machine learning approach. Supposingly a convolutional neuron network with a supervised learning algorithm will be used for this project.