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Exploring social sensing techniques for measuring rainfall and flood response in urban environments

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Abstract

Extreme rainfall is expected to occur more often in the future as a result of climate change. To be able to react to this, urban water managers need to accurately know vulnerable spots in the city, as well as the potential impact to society. Currently, detailed information about rainfall intensities in cities, and effects of intense storm events on urban societies is lacking.

In this study, we will present first results of social sensing experiments to measure rainfall and flooding using a smartphone app. Users of the app are asked to submit rainfall reports by selecting an rainfall class from a pre-defined list of (6) classes, to register time and location and to make a photo of the rainfall. Rainfall photos will be used in a future experiment for automated retrieval of rainfall classes using computer vision techniques.

With the experiments we aim to validate rainfall observations made by lay people and to evaluate factors that influence the willingness of users to contribute observations. The results show that users consistently distinguish heavy and extreme rainfall from drizzle and mild rainfall, but have difficulty in making more detailed distinctions. The main factor driving willingness to contribute to the social rainfall sensing experiments is the perceived usefulness of rainfall reporting.