Leveraging Different Visual Designs for Communication of Severe Weather Events and their Uncertainty

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1 Abstract

Effective communication of potential weather hazards and its uncertainty to the general public is key to prevent and mitigate negative outcomes from weather hazards. The general public needs effective tools at hand that can allow them to make the best decision as possible during a severe weather event. Currently, there are many approaches to weather forecast visualization, such as contour and thematic maps that communicate forecast information about specific geographic regions [11, 4]. Visualization guidelines and best practices in visualization can help to improve these designs and make them more effective [3, 2, 1, 13].

In this ongoing work, we present six interactive visual designs for mobile visualization of severe weather events for the communication of weather hazards, their risks, their uncertainty, and recommended actions. Our approach is based on previous work on uncertainty visualization [12, 8], cognitive science [10, 9], and decision sciences for risk management [5, 6, 7]. We propose six configurations that vary the ratio of text vs graphics used in the visual display, and the interaction workflow needed for a non-expert user to make an informed decision and effective actions. The six configurations of visual designs are: (1) only text visualization and minimum interaction, (2) only text visualization and interactive features, (3) mixed approach of text and graphics and minimum interaction, (4) mixed text and graphics and interactive features, (5) only graphics and minimum interaction, (6) only graphics and interactive features. Our goal is to test how efficient these configurations are and to what degree they are suitable to communicate weather hazards, associated uncertainty, risk, and recommended actions to non-experts. Our visual designs are implemented in *Figma*, a prototyping tool to create wire-frames, consistent design systems, and make interactive with intuitive transitions by using different interactive user workflows. Future steps include two cycle of evaluations, consisting of a first pilot to rapidly test the prototype with a small number of participants, collect actionable insights, and incorporate potential improvements. In a second user study, we will perform a crowd-sourced extensive evaluation of the interactive visualization prototypes.

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