Ditto: Exploring data in large display environments through speech+mid-air gesture interactions

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Summary:

During visual data exploration, analysts often approach a dataset incrementally, segmenting data into meaningful partitions and representing these parts in multiple, related views. Large displays can support data exploration by providing space to juxtapose or organize related views. We present an interaction technique for creating many, related views of data for data exploration through synchronous speech and mid-air pointing gestures. We present our design goals, which leverage the combined affordances of speech, pointing gestures and large displays, with the aim of supporting exploratory tasks and transitions. We implemented our design in a large display environment with gesture tracking and a speech input system, along with a touch system for freely positioning visualizations. We implemented this technique in an application called Ditto, and evaluated through a user study where participants explored a COVID-19 dataset. We found that they used both modalities to interact and were able to efficiently create coherent sets of views which could be arranged on the large display.

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