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Title: Dynamic Data Physicalisation and Tangible User Interfaces

With the growing amount of data produced by humans as well as embedded sensors, there is a need for tools to analyse the resulting large datasets. Nowadays the exploration and analysis of large datasets is mainly supported by advanced visualisation techniques. While the visual modality represents only one possibility to represent data, there is recently the emerging field of so-called data physicalisation where data is represented in physical space via different physical variables and can no longer only be explored visually. Other senses such as temperature or tactile feedback can be used in combination with three-dimensional data visualisation for providing better insights about multi-dimensional datasets and enable new forms of next generation user interfaces and interactions with large datasets. However, most existing data physicalisation solutions are static and cannot easily be updated based on changes in the underlying dataset or based on a user's interactions with the data. We are interested in a framework for dynamic data physicalisation that defines possible combinations of physical variables to form new forms of dynamic data physicalisation based on a grammar for data physicalisation. There are various opportunities for doing research on dynamic data physicalisation, ranging from a detailed exploration of the dynamic data physicalisation design space to a general and extensible software framework for dynamic data physicalisation or the development and evaluation of general dynamic data physicalisation guidelines as well as the further development of our Tangible Holograms (TangHo) platform. Further, there is always the possibility to investigate the potential of dynamic data physicalisation solutions in specific application domains by building specific prototypes and performing the corresponding evaluations and user studies.

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