Micro Visualizations for e-ink Screens

Details

Advisor

Petra Isenberg, https://petra.isenberg.cc
petra.isenberg@inria.fr

Internship Location

Bat 660, Digiteo Moulon, Université Paris Sud, 91190 Gif Sur Yvette

Topic

Micro visualizations, are small data visualizations that are useful in display contexts that can only dedicate minimal rendering space for data representations. Specifically, we define micro visualizations as small-scale visualizations that lack or have a limited set of reference structures such as labels, data axes, or grid lines and have a small physical footprint of a few square centimeters. Micro visualizations can be as simple as small unit-based visualizations such as a battery indicator but also include multi-dimensional visualizations such as star glyphs, small geographic visualizations or even small network visualizations. Although micro visualizations are essential to mobile visualization contexts, we know surprisingly little about their general visual and interaction design space or people's ability in interpreting micro visualizations.

E-ink displays are an interesting but challenging display environment for micro visualizations. In particular, e-ink displays are useful on watches, as retail labels, in mobile phones or e-readers. However, their limited capabilities to hold color means that visualization design is necessarily limited. The goal of this internship is to derive a design space for e-ink based data visualizations and to ideally come up with design guidelines or a toolkit to develop a set of standard or dedicated visualizations for this display environment.

E-ink application examples

Background

The project is part of work on an ANR grant on studying micro visualizations in various usage scenarios. Related work includes:

Beck, F., T. Blascheck, T. Ertl, and D. Weiskopf (2017a). “Word-Sized Eye Tracking Visualizations”. In: Eye Tracking and Visualization. Ed. by M. Burch, L. Chuang, B. Fisher, A. Schmidt, and D. Weiskopf. Springer, pp. 113–128.

Fuchs, J., P. Isenberg, A. Bezerianos, and D. Keim (2017). “A Systematic Review of Experimental Studies on Data Glyphs”. In: IEEE Transactions on Visualization and Computer Graphics 23.7, pp. 1863–1879.

Goffin, P., J. Boy, W. Willett, and P. Isenberg (2017). “An exploratory study of word-scale graphics in data-rich text documents”. In: IEEE Transactions on Visualization and Computer Graphics 23.10, pp. 2275–2287.

Goffin, P., W. Willett, J. - D. Fekete, and P. Isenberg (2014). “Exploring the placement and design of word-scale visualizations”. In: IEEE Transactions on Visualization and Computer Graphics 20.12, pp. 2291–2300.