Designing through Time in Drawing Applications

Abstract

The project will apply Research Through Design (RtD) methodology [1,2] to assess the potentials of novel command-history interactions [3] for drawing applications. Enabling partial change of (non-last) past events or commands present opportunities for controlled and explorative diverging in rich application domains like drawing. The intern will first use qualitative methods to identify the potential of such techniques for drawing application. In line with the RtD, the intern will iteratively design prototypes and evaluate them with novices and professionals.

Context

Histories of command and their functionalities have undergone little evolution since their initial design decades ago and the ubiquitous "undo-redo" commands. It allows basic navigation and error correction in the document's chronology, but these functionalities remain limited and can cause severe information loss [3]. Numerous new and augmented features for command histories have been proposed in the Human-Computer Interaction (HCI) literature: parallel timelines, undoing actions that are not the most recent, undoing commands based on their location in the document, etc. However, these techniques were designed and evaluated independently, and are usually incompatible with each other—sometimes even with basic undo/redo! Consequently, they are almost never implemented in real applications.

A unified model of interaction history was proposed in [3] which allows to navigate, reuse, and modify past commands as well as their parameters and the input involved in their computation. The work in [3] is a conceptual model of what information to remember, and how to organize it, so advanced history features can be implemented. Its purpose is to be adapted to specific application domains, such as text processing, video, or painting applications.

What features are most beneficial and best adapted to users of a specific software remains to be explored, as well as the best ways to make these features understandable and interactive.

The project

The candidate will apply methods from RtD to investigate users reactions, preference, and novel ideas when introduced to the features described in [3], in order to guide the design of real interactive prototypes and pave the way to a PhD on advanced history-of-commands mechanisms. The task will consist in conducting interviews, brainstorming, and prototyping sessions with real users of painting applications. That includes building and presenting them iterative mockups and demonstration videos, then prototypes of functional interfaces from the gathered feedback.

The candidate

The candidate should have experience in design methods, preferably in RtD, and be able to run interviews and workshops. A strong technical background is a plus, and will be required for a possible follow-up PhD.

Details

Funding: 6 months. The internship can develop into a 3-year PhD as a continuation on the same topic.
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References

[1] Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). Research through design as a method for interaction design research in HCI. ACM CHI. https://doi.org/10.1145/1240624.1240704

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[3] Nancel, M. & Cockburn, A. (2014). Causality – A Conceptual Model of Interaction History. ACM CHI. http://dx.doi.org/10.1145/2556288.2556990