

Chapter 2

Methodology

I investigated public display interaction through interactive prototypes that are dedicated to one specific problem or research question. These prototypes¹ are tailored around that specific research question. In preliminary and laboratory studies, first insights are gathered and the prototype is redefined in iterative cycles. Means of attention measurement, such as eye-tracking and recall and recognition tests, may be applied during this initial phase of analysis.

For the main part of the evaluation, the system is then deployed in a public setting for between one and four weeks. During the whole time of the installation, the display and its users, as well as passers-by are observed by research assistants. On-site observations and semi-structured interviews form the basis of the qualitative analysis of the prototype. This mainly includes typical user behavior patterns that are triggered by the system, but also specific user comments.

In addition to data gathered from the on-site analysis, the system constantly captures the current screen content, as well as user behaviors and gestures using a depth camera. This footage is semi-automatically processed by our custom analysis software suite. It delivers instances of a specific interaction situation that are the target of investigation. These situations are then manually annotated by research assistants and students (see Fig. 2.1). Gathered data is used for quantitative analysis such as measurements of conversion rate and interaction duration.

¹Here mainly based on this implementation: <https://github.com/QULab/pdnui>.

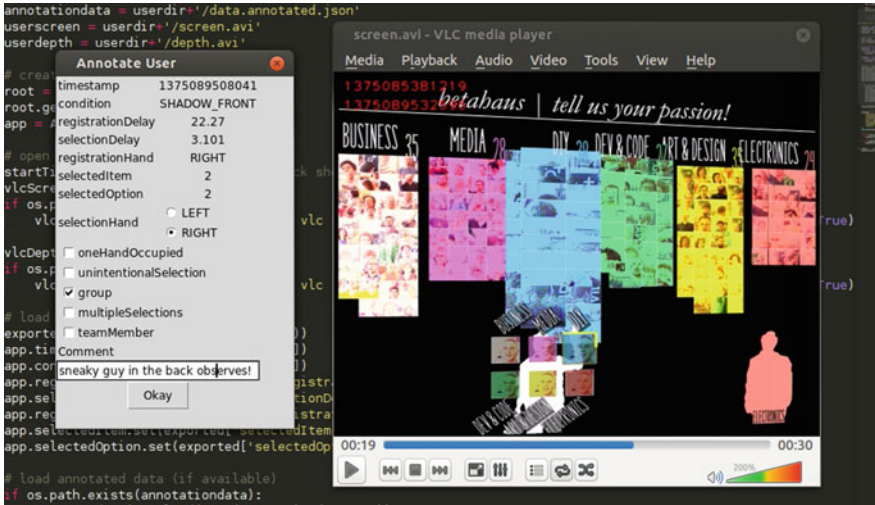


Fig. 2.1 Exemplary custom annotation tool that was used in the field study described later in Chap. 8. The *left* window shows the annotation interface that allows the annotator to easily check specific observed patterns for each user. A free text field for comments is also provided. The *right* window shows a segment of the recorded and analyzed video data. The material is anonymous, yet allows for annotation of specific behaviors or gestures. Segments of user activity that need to be annotated were automatically extracted from the raw data before

2.1 Ethics

In the framework of this dissertation work, data from human participants was gathered in laboratory and field studies. It was of high priority to protect this data according to legally effective privacy and data protection guidelines. It was guaranteed that no sensitive ethical or legal issues were touched in the laboratory studies. The participants were informed about the recorded data and the purpose of the studies prior to every experiment and were able to abort at any time without giving reasons. During the studies, demographic and physiological data of participants, data about their behavior, as well as their evaluations of the application was gathered. This data naturally deserves protection.

Furthermore, it was ensured that no sensitive data was captured in the field studies. The gathered data was anonymous and did not include private areas. The system did not record audio or image data of passers-by or users at any time. It is technically impossible to draw conclusions on the identity of the captured people from the recorded footage (compare Fig. 2.1 right). Supplementary photos and video footage was captured under the consent of the subjects and was only used in an anonymized fashion.

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