Towards Eliciting Feedback
for Artworks on Public Displays

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Abstract
The internet and digital technologies have had a strong influence on how art is created, distributed and perceived. Museums and art galleries, however, are still predominantly places of passive consumption of art. In our project, we explore new forms of communication and feedback between artists and their audience, mediated by public displays. In this work-in-progress paper, we present a situated feedback system for giving feedback on artworks in a public setting. We present a preliminary evaluation of the system with artists and potential audience on their reactions to the system and eight different types of feedback.

Author Keywords
Public Displays; Feedback; Situated Feedback; Digital Art; Situated Crowdsourcing.

CCS Concepts
• Human-centered computing → Displays and imagers;
• Human-centered computing → Graphical user interfaces; • Human-centered computing → User studies; • Information systems → Crowdsourcing;

Introduction
The Internet and World Wide Web have opened an opportunity for artists to seek feedback in online communities and on websites. Feedback on these websites is, however, unstructured and often of low quality [1]. Researchers have consequently investigated ways of improving the feedback with better structure [4], rubrics [7], and scaffolding [8]. *Online Feedback Exchange systems* [2] and *crowd feedback systems* [3, 4, 5, 6] are computer-mediated systems that enable individuals to collect feedback from a large and diverse number of people.

Art communicates the social and personal values of the artist [13]. Given this cognitive and social function of art, communication and feedback between the audience and the artist are an underexplored research area.

Due to the growing synergies between art and technology and the affordances of locative media [9], public displays can be used to exhibit digital art [10] and elicit situated interactive feedback [11, 12].

Feedback on Public Displays
Public displays have several unique characteristics that make them ideal for serendipitously collecting feedback via situated crowdsourcing [21]. Public displays attract the attention of passersby. This characteristic is well researched and has been exploited in numerous public display installations all over the world [18, 19, 20]. A further advantage of *public display feedback systems* is that they allow for collecting feedback from uncompensated samples of the audience. With such a system, an artist may tap into a large pool of people at no cost to receive authentic and rich contextual feed-back. Public displays further allow for recording of non-verbal reactions of members of the audience.

While the feasibility of eliciting feedback has been proven in the literature, e.g. by Hosio et al. [11, 12], Goncalves et al. [16] reported that feedback on public displays may be of low quality and noisy, due to the often playful approach that users take in their inter-action with this feedback medium. Consistent with the literature, we expect that giving the feedback a structure and using rubrics will significantly improve the quality of text-based feedback entered on public displays and the usefulness of the feedback for its receiver. Given that entering text on public displays may be perceived as cumbersome, we further hypothesize that public displays are especially suitable for collecting non-text based and visual feedback.

In this paper, we present a public display feedback system in the form of a digital art installation. We discuss the results of a preliminary evaluation of the system from two perspectives: artists and potential audience. First, we interviewed artists and inquired what feedback they would like to receive on public displays in general. We then presented them with eight pre-defined feedback mechanisms. Second, we evaluated the eight different feedback mechanisms with potential members of the audience.

Digital Art Installation for Eliciting Situated Feedback from the Audience

In this section, we present the *DUPLEX* concept of an interactive digital artwork installation allowing for bi-directional communication to take place between artists and audience using public displays (see Figure 1). The concept comprises a large public display (main display) depicting one digital artwork at a time. A touchscreen input device is placed in front of the main display. Both the main display and the input device are always awake to indicate the affordance of interactivity to passersby and to combat interaction blindness [14].

Artists from anywhere in the world can upload their digital artworks to this digital art installation by visiting a dedicated web page with an upload form. Uploaded artworks are entered in a queue after review by a researcher to ensure that unsuitable work is not displayed in the public installation. The fundamental difference to a traditional gallery setting, as found in museums and art galleries, is the interactivity of the installation that allows for communication to take place between the audience and the artist, mediated by the public display.

Type	Screenshot
Like/ Dislike	
Multiple Choice	
Ask Question	
Answer Question	
Likert-scale	
Touch Artwork	
Image selfie	
Video recording	

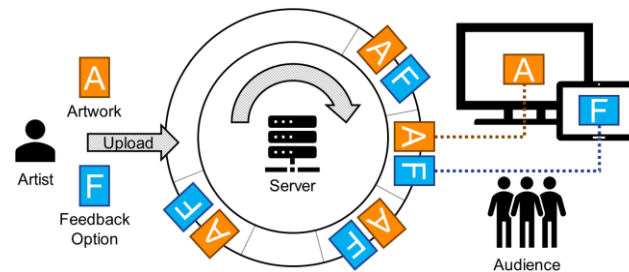Table 1: Pre-defined feedback mechanisms in our studies.

Figure 1: Illustration of the DUPLEX concept.

Communication from Audience to Artist
The audience controls the art installation by giving feedback on the touchscreen device. Once feedback is given for an artwork, a new artwork is displayed on the main display and feedback is elicited for this artwork. The two-screen setup was chosen because it avoids issues relating to showing personal content on public screens [17]. By giving the member of the audience a private screen for data entry, we avoid these privacy-related issues. Bystanders can still appreciate the artwork on the large display while feedback is entered privately on the small display.

Communication from Artist to Audience
Artists will be able to choose from a list of pre-defined feedback options, or freely define their own feedback. Artists could exploit the art installation in unexpected ways by giving the audience a task to complete. Our system could, for instance, be used to deliver interactive experiences to the audience. Our system allows for recording of non-verbal reactions and even staged responses, enactments and performative interactions [5, 23], potentially complementing the artwork and its viewing experience. Our installation could also be appropriated to conduct experiments with

the situated crowd, for example to explore potentially surprising interactions.

Allowing for Appropriation of the System
Appropriation is the adaption of technology by its users in ways the designer did not envisage [22]. We encourage appropriation of the installation by the artist and by the audience. In doing so, we are interested in what kind of communication and strategies between artists and audience will emerge and how the audience reacts to the possibly surprising interaction with the artist.

Pedagogical Purpose of the Installation
We intend to bootstrap the art installation with artworks from young art students from local art schools. The system could therefore provide authentic feedback to the new generation of aspiring artists.

Implementation

We implemented the feedback system with a light-weight prototype, depicted in Figure 2. The system consists of a display and an Android tablet on a lightweight floor stand. The mobile application running on the tablet was developed with Apache Cordova. The display is connected to a laptop computer which displays a maximized browser window. Both the tablet and the computer are connected to a Web server via WebSocket connections. The WebSocket server pushes the artwork to the main display and the associated feedback to the mobile application on the tablet. Feedback is stored in a MongoDB database on the server. Images and videos are also stored locally on the tablet and are automatically backed-up to Google Photos in the cloud.

We implemented eight atomic feedback mechanisms (see Table 1 in the Sidebar and the example in Figure 3).
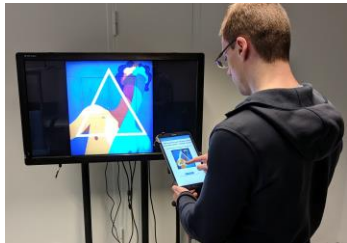
Figure 2: A person using the prototype in the laboratory study. Artwork credit: Stéphan Valentin.
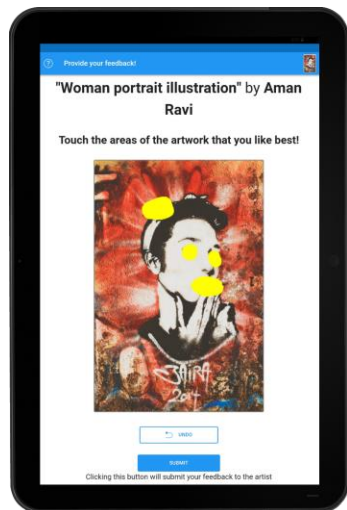

Figure 3: An example of feedback provided with the "Touch Artwork" feedback. Artwork credit: Aman Ravi.

These feedback mechanisms were selected because they represent some of the most common forms of data entry in online questionnaires. We hand-picked eight different artworks from a list of public domain artworks on Wikimedia Commons and from Unsplash, a stock photography website. We selected the artworks based on two criteria. First, the artworks are modern and appear to be created by contemporary artists. For instance, the collection contains several depictions of street art. Second, we selected artworks from different styles. The collection contains some very abstract pieces of art, but also some more realistic ones.

Needfinding Study with Artists

We invited two young local artists (A1, age 26, and A2, age 23, each with around three years of experience as an active artist) to an hour-long interview session. The artists were each compensated with a cinema ticket and coffee voucher worth US $15. We first presented the prototype to the artists without going into detail about the different feedback types. Our aim was to find out the first impressions of the installation on the artists, how the installation would benefit them, and what kind of feedback the artists would find useful. We then let each of the artists use the installation while thinking aloud. The discussion unfolded around the needs of the artists and their requirements for receiving feedback.

First impressions were positive, with the installation being of immediate use to both artists. The artists' thought that the installation would solve three important needs: 1) developing one's skills, 2) receiving confirmation from the crowd, and 3) satisfying the need to market one's artworks and person. We briefly report on each of these three aspects.

Skill Development
The public display installation could be used to advance one's artistic skills. The feedback system would allow to *"identify both one's weaknesses and strengths"* and to expand one's skill set by complementing or contrasting existing skills (A2). Both artists agreed that they would not be willing to publish their unfinished artworks on public displays. This finding confirmed our initial assumption that the public display installation would be best suitable for showcasing finished artworks, as opposed to unfinished art and draft designs.

Confirmation from the Crowd
The feedback system could provide confirmation to artists. First, an artist could validate if the intention and meaning of an artwork is understood by the audience. Both artists regarded this as valuable information. Second, this type of feedback could provide the artist with positive self-affirmation (A1).

Marketing Purposes
Besides the immediate benefit of exhibiting artworks on public displays, as documented by Kukka et al. [10], the art installation was regarded as useful for establishing a brand and positioning oneself as an artist. A1 argued that with the help of the installation, artists could prove their reputation to potential buyers and gallerists. The system could be used to establish and validate a reputation in a certain niche.

Value of the Feedback Types for the Artists
Based on our observation in the workshop, the usefulness of the eight different feedback types for the artists is listed in Table 2. In this table, one star represents a low usefulness of the feedback for the artists, and three stars the highest usefulness.

User Study

Following our needfinding study with artists, we were also interested in exploring how the audience perceives the installation and the different feedback mechanisms. To this end, we conducted a user study with 12 participants (aged 21 to 52, mean age 28, 5 females). The participants were recruited on our campus with posters and e-mail lists.

The participants were invited to use our feedback system in a laboratory setting under the observation of a researcher. Each participant was given a short briefing about the purpose of the study and the installation, and then provided feedback for each of the eight pre-defined feedback types. Both the order of the artworks and the associated feedback types were randomized after each trial.

Feedback	Artists	Viewpoint	Audience[1]
Like/Dislike	*	<	3.58 (1.38)
Likert-scale	***	=	4.17 (0.94)
Multiple Choice	***	=	3.92 (0.90)
Answer Question	**	=	3.42 (1.08)
Ask Question	*	<	3.67 (1.30)
Touch Artwork	***	=	4.17 (1.03)
Image selfie	*	=	2.33 (1.55)
Video recording	**	>	2.92 (1.24)

Table 2: Viewpoints of artists and audience. Opposing views are marked in blue, agreement in green.

[1] Mean responses (and standard deviation) for the question "Overall, how do you like this feedback", on a scale from 1 (Strongly Dislike) to 5 (Strongly Like).

Immediately following the trial, we collected information with an online questionnaire and unstructured interviews. Participation took around 20 minutes and was compensated with a coffee voucher worth US $5.

Results

The mean responses and standard deviation are listed in Table 2. Touching and painting areas of the artwork was engaging the participants. Likert-scale and multiple choice were perceived as an easy way of giving feedback. Selfie images were a surprising interaction. 8 out of the 12 participants reported that they did not know what to do. Unexpectedly, three participants used the video feedback to verbally give feedback to the artist.

Discussion and Future Work

With this situated system, we aim to not only elicit feedback from a diverse audience with different perspectives and experiences, but also to "configure spaces for imagination and dialogue that make those differences sensible as well as acceptable and valuable" [23] to two groups of actors: artists and their audience.
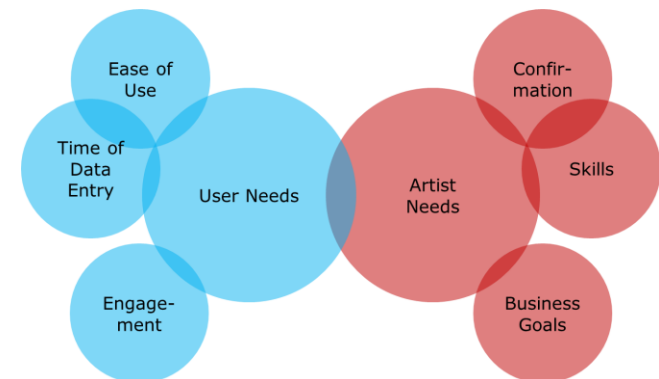

Figure 4: User needs and artist needs.

The artists and participants in our study concur in their assessment of several types of feedback, but disagree in others (see Table 2 and Figure 4). Since "dissensus is the engine of creativity" [23], we are interested in exploring these opposing viewpoints in future work. Selfie images, for instance, can be highly engaging for certain members of the audience [15]. The two artists in our needfinding study, however, deemed selfie images as not valuable. Further, while the artists regarded seeing videos of reactions to their artwork as useful, the audience was confused by this surprising interaction. Lastly, the participants liked the convenience of giving feedback in the form of a simple thumbs up/down rating, while artists disliked the low informational value of this feedback type. Future research will need to contrast and reconcile such differences to find a common ground.

As a first inquiry, our study is system-driven, rather than user-driven. In future work, we envision that artists could appropriate the feedback system for their own purposes. We see the atomic feedback types from our study as components that could be used to compose more complex feedback mechanisms. For instance, artists could combine visual feedback that allows the audience to draw on the artwork (see Figure 3) with free-form text feedback to inquire "which parts do you dislike and why." Such compositions of tasks and atomic feedback types have the potential to provide a benefit beyond the mere text-based feedback of online communities and many crowd feedback systems.

Conclusion

We presented a situated feedback system for digital art on public displays. In a needfinding and user study, we investigated the different needs of two main types of users of this public display feedback system: artists and potential members of the audience. The artists in our study were positively impressed and excited about the opportunities that our feedback system could potentially afford them. Our user study established the feasibility of the feedback system and furthered our understanding of which different atomic feedback mechanisms may be most suitable for eliciting feedback on a public display installation. Overall, our studies constitute evidence of the potential of public display installations for eliciting summative feedback from the situated crowd.

With our art installation with situated feedback on public displays, we seek to stimulate communication between artist and audience and to establish new forms of audience participation on public displays. We aim to contribute towards a greater understanding of how public displays may allow the reimagination of traditionally co-located feedback interactions.

Acknowledgements

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