

---

# CrowdCrit: Crowdsourcing and Aggregating Visual Design Critique

**Kurt Luther**

Carnegie Mellon University  
kluther@cs.cmu.edu

**Amy Pavel**

University of California, Berkeley  
amypavel@gmail.com

**Wei Wu**

University of California, Berkeley  
wuhuwei@gmail.com

**Jari-lee Tolentino**

University of California, Irvine  
jltolent@gmail.com

**Maneesh Agrawala**

University of California, Berkeley  
maneesh@eecs.berkeley.edu

**Björn Hartmann**

University of California, Berkeley  
bjoern@eecs.berkeley.edu

**Steven Dow**

Carnegie Mellon University  
spdown@cs.cmu.edu

**Abstract**

People who create visual designs often struggle to find high-quality critique outside a firm or classroom, and current online feedback solutions are limited. We created a system called CrowdCrit which leverages paid crowdsourcing to generate and visualize high-quality visual design critique. Our work extends prior crowd feedback research by focusing on scaffolding the process and language of studio critique for crowds.

**Author Keywords**

Design; critique; crowdsourcing; scaffolding; feedback

**ACM Classification Keywords**

H.5.3. Information interfaces and presentation (e.g., HCI): Group and Organizational Interfaces

**Introduction**

For centuries, the “studio critique” model has provided a foundational exercise for art and design, and more recently, for project-based education in computing and engineering. Critiques can help novices to understand key principles in a domain, to articulate the goals and assumptions behind their work, and to recognize how others perceive their work [3]. Effective design critiques typically involve face-to-face interactions between people in a small group setting.

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s). Copyright is held by the author/owner(s).

*CSCW'14 Companion*, February 15–19, 2014, Baltimore, MD, USA.

ACM 978-1-4503-2541-7/14/02.

<http://dx.doi.org/10.1145/2556420.2556788>

### Layout

Good alignment

Ueven margins

Poor cropping

### Readability

No spelling errors

Poor kerning

Background lacks contrast

### Simplicity

Simple and clean

Overuse of images

Lacks white space

### Emphasis

Strong focal point

Lacks hierarchy

False proximity

### Balance

Good use of symmetry

Lacks balance

Lacks movement

### Consistency

Good repetition

Element disrupts unity

Poor consistency

### Appropriateness

Reaches intended audience

Mixed messages

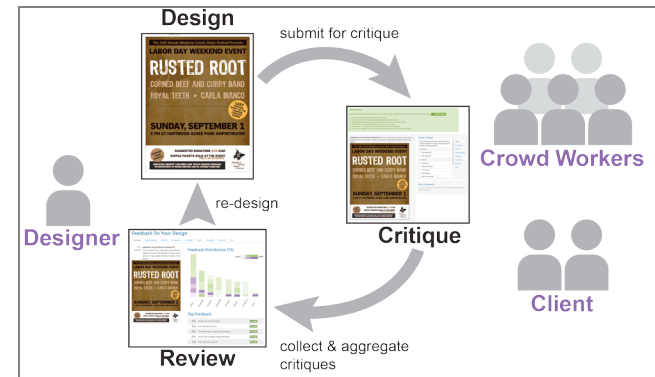
Inappropriate message

**Table 1.** Design principles and sample critique statements (positive and negative).

Unfortunately, high quality critique can be difficult to obtain outside of a design firm or classroom, especially for novice designers, who may need help with everyday tasks like posters, flyers, or slide decks. Designers may seek critiques in online communities, but even those who spend the time building a reputation are often unsatisfied with the low quality and quantity of critiques they receive [8]. Novice designers may experience evaluation apprehension and avoid sharing their works-in-progress alongside experts [4]. Paid crowds are attractive because of their speed, low cost, and scalability, but most crowd workers provide poor quality feedback because they lack design knowledge. When crowd workers have been integrated into a design process, their role has usually been to provide high-level impressions or contribute outside perspectives [2]. One recent study [9] showed that structured interfaces can help crowds provide more targeted feedback, but the study did not emphasize design principles or the process and language of critique.

### The CrowdCrit System

We created the CrowdCrit system (Figure 1) to facilitate high-quality crowd critique using a learning theory called *scaffolding* [7]. CrowdCrit scaffolds the critique process and language for crowd workers by allowing them to select from a series of 70 pre-authored critique statements, based on widely followed visual design principles, and visually annotate relevant areas of the design. This system helps even novice crowd workers produce detailed, actionable feedback. Designers receive the critiques within hours and explore them using a novel aggregation interface. CrowdCrit is implemented as a web-based tool with Python, JavaScript, and the Mechanical Turk API.



**Figure 1.** The CrowdCrit system allows designers to submit preliminary designs to be critiqued by online crowds and clients. The system then aggregates and visualizes the feedback for designers.

### Critique Statements

We compiled a holistic set of 70 critique statements based on principles of effective visual design compiled from design textbooks (e.g. [1]). After several design iterations, this resulted in a group of seven high-level principles (see Table 1). Each statement has a short title, a more detailed description of the issue, and a possible, generic solution. This format is meant to embody Sadler's [5] criteria for good feedback (*specific, conceptual, and actionable*) and provide a basic level of utility. Because traditional critiques involve both positive and negative statements, we included both strengths and weaknesses.

### Eliciting Critique

The CrowdCrit critique interface is shown in Figure 2. Critique statements are organized into eight tabs: one for each of the seven design principles, plus an "Other" tab for critiques that our list may overlook. Within each tab, a definition of the design principle appears at the



**Figure 2.** The CrowdCrit critique interface. (1) The design's title, brief description, and target audience. (2) The design to be critiqued. (3) A crowd worker-provided image annotation, indicated by a pink box. (4) Design principles used to organize critique statements. (5) The "Poor font appearance" critique statement is selected. (6) Annotation tools for marking the location of the critique. (7) A worker-provided text comment elaborating on the critique. (8) Other critiques provided by the worker for this design; clicking one will display associated annotations and comments.

top, followed by related critique statements grouped into positive and negative issues. The short description appears by default, but hovering over the abbreviation causes the full statement to pop up.

To begin the critique process, crowd workers are shown a design and the list of critique statements and asked to select one that applies. Next, workers are prompted to use the annotation tools to select the relevant region of the design. Workers can then provide more details for the critique (e.g., suggestions for how to resolve the issue) as a text comment. They can repeat this process as often as they want.

#### Aggregating Critique

The CrowdCrit aggregation interface has two main views: an "Overview" tab providing a summary of all critiques for the design (Figure 3, left), and "Principle" tabs which filter critiques by a particular design principle (Figure 3, right).

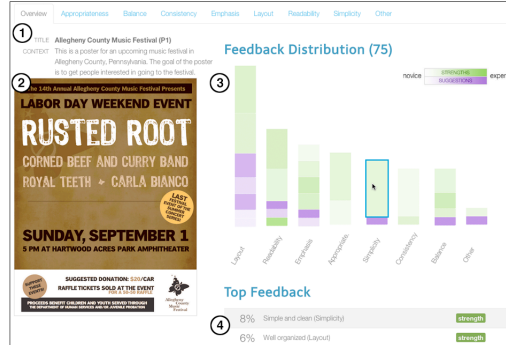
The right side of the Overview tab displays the total number of critiques for the design (75 in Figure 3, left), along with a stacked bar chart showing one bar per principle. Bars are ordered by decreasing critique count so that the principle with the most critiques appears first. Hovering over any bar segment displays a particular critique statement identified by workers. Color encodes critique valence; positive critiques are green and negative critiques are purple. We use the labels "strengths" and "suggestions" to emphasize improvement through iteration, rather than admonishment for mistakes. Crowd expertise is encoded in lightness values; darker shades indicate critiques from workers with higher expertise.

Below the bar chart, a "Top Feedback" section presents the most frequently used critique statements, along with their parent principle, valence, and the percentage of total critiques that they represent. This section is intended to help guide designers towards the most serious issues with their design.

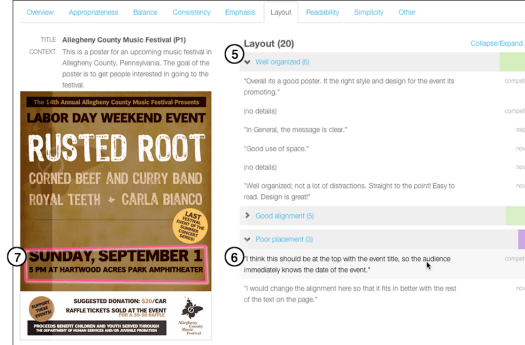
The Principle tabs embody a "zoom and filter" approach [6], filtering critiques to only those associated with the selected principle (e.g. *Layout* in Figure 3, right). Critique statements for a given principle ordered by how many worker critiques each contains. To the right of each statement name is a corresponding histogram bar, reflecting the proportion, positive/negative valence, and average expertise of critiques for that statement.

For each critique statement, the critiquer's comment is shown along with an expertise label. We label workers in the bottom quartile of design expertise as novices, workers in the middle quartiles as competent, and

## OVERVIEW TAB



## PRINCIPLE TAB



**Figure 3.** The Overview tab (left) and Principle tab (right) for the CrowdCrit aggregation interface. (1) Contextual info about the design. (2) The design itself. (3) The stacked bar chart, showing the distribution of critiques for each design principle. (4) Critique statements most frequently chosen by crowd workers. (5) The *Layout* principle is selected, showing a collapsible list of critique statements chosen by the crowd. (6) An individual critique, showing text comments and the worker's design expertise. (7) Hovering over the individual critique reveals the corresponding graphical annotation, indicated by the pink box.

workers in the top quartile as experts. Hovering over any critique causes all corresponding annotations to appear on the design itself. "Details on demand" [6] are provided through options like collapsible critique lists, and hoverable definitions and annotations.

## Evaluation and Future Work

We evaluated CrowdCrit by organizing a poster design contest in which 14 participants with a range of design experience received CrowdCrit critiques midway through their design processes. Our interviews and quantitative results showed that designers generally found the crowd feedback helpful, and designs with more negative critiques were more likely to improve. In future work, we are exploring whether focusing crowds on one design principle at a time leads to higher quality critiques.

## Acknowledgments

This material is based upon work supported by the National Science Foundation under Grant No. IIS

1210836 and an Okawa Research Grant. We thank Pengcheng Tang for development assistance and Brian Bailey for helpful conversations.

## References

1. Dondis, D.A. *A primer of visual literacy*. MIT Press, Cambridge, Mass., 1973.
2. Dow, S., Gerber, E., and Wong, A. A pilot study of using crowds in the classroom. *Proc. CHI 2013*, ACM (2013), 227–236.
3. Feldman, E.B. *Practical art criticism*. Prentice Hall, 1994.
4. Marlow, J. and Dabbish, L. From Rookie to All-Star: Professional Development in a Graphic Design Community of Practice. To appear in *Proc. CSCW 2014* (2014).
5. Sadler, D.R. Formative Assessment and the Design of Instructional Systems. *Instructional Science* 18, 2 (1989), 119–44.
6. Shneiderman, B. The eyes have it: a task by data type taxonomy for information visualizations. *IEEE Symposium on Visual Languages, 1996. Proceedings*, (1996), 336–343.
7. Soloway, E., Guzdial, M., and Hay, K.E. Learner-centered design: the challenge for HCI in the 21st century. *interactions* 1, 2 (1994), 36–48.
8. Xu, A. and Bailey, B. What do you think?: a case study of benefit, expectation, and interaction in a large online critique community. *Proc. CSCW 2012*, ACM (2012), 295–304.
9. Xu, A., Bailey, B.P., and Huang, S.-W. Voyant: Generating Structured Feedback on Visual Designs Using a Crowd of Non-Experts. To appear in *Proc. CSCW 2014* (2014).