What Are Your Impressions? Proposal for Emotional Assessment Platform

Jun Iio

Chuo University, Tokyo, 162-8478, Japan

ABSTRACT

Considering the significance of compelling visuals in conveying information and emotions, we propose a general-purpose emotion evaluation system for multiple images. It employs Russell's valence-arousal emotion model to understand emotional responses and finds that distinctive movie posters often elicit low arousal and positive valence. Our previous study on emotional reactions to movie posters revealed that distinctive posters often received assessments marked by low arousal and positive valence. An enhanced system was developed to evaluate any image with administrative features tailored for experimental projects, allowing users to create projects, evaluate images, and view results. We plan to conduct experiments involving sensitivity evaluations to distinguish between human-created and machine-generated (generative artificial intelligence-created) artworks, evaluate fashion items for fashion ability and likability, and focus on understanding preferences across different age groups.

Keywords: Emotional evaluation, Emotional responses on images, Enhanced system for image assessment, Valence-arousal emotion model

INTRODUCTION

Compelling visuals, spanning photographs, drawings, paintings, and illustrations significantly enhance daily encounters, convey information, and elicit emotions. Recognizing the impact of specific images and distinguishing them from less impactful ones is valuable for various applications, including marketing investigations, product design, and academic research. However, the evaluation of creative expression presents inherent challenges.

Inspired by the outstanding emotional assessment of emojis (Kutsuzawa et al., 2022), we began studying the emotional evaluation of several images. To understand user responses to movie posters (Hanagaki and Iio, 2023), we employed Russell's valence–arousal emotion model (Russell, 1980; Kuppens et al., 2013), incorporating measures of arousal and valence. Our investigation revealed that distinctive movie posters often receive assessments marked by low arousal and positive valence.

Based on these findings, we enhanced the system titled General and Universal Image Data Evaluation System (GUIDES) to accommodate images by incorporating administrative features tailored for experimental projects. This study provides a concise overview of the system, emphasizes its capabilities, and explores a planned experimental use case.

OVERVIEW OF THE SYSTEM

When the participants accessed the GUIDES server, a list of projects appeared on the screen (Figure 1). Registered users can create and design these projects.
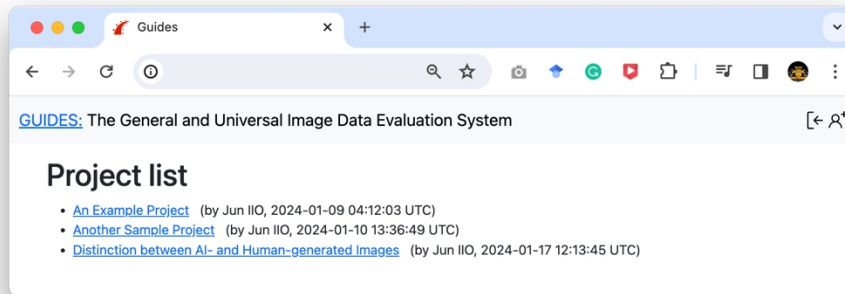

Figure 1: Index page of the GUIDES server shows the projects hosted on the server.

Assessment Process

Although the system uses user management to create a project, access to the evaluation pages is open to the public; therefore, there is no need to register an account to access them.

The evaluation process comprised four steps: 1. Information Consent; 2. Introduction; 3. Evaluation; and 4. Display of Evaluation Results. Before starting the assessment, the system provided information consent from the participants to provide permission to participate in the evaluation. Figure 2 shows the start page summarizing information consent.
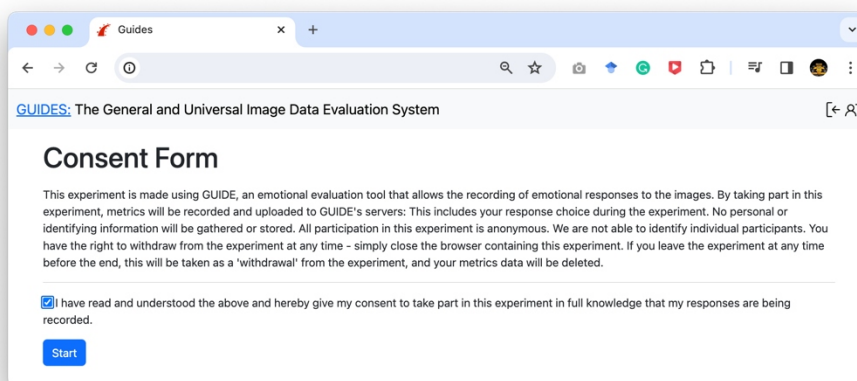

Figure 2: Start page shows the information consent. Clicking the checkbox at the bottom of the page makes the button for starting the assessment to appear.

The next step is the introduction. The introduction screen provides the project title and description to elucidate the purpose of the image evaluation, accompanied by a 'Start Evaluation' button. Clicking this button directs users to the next page for an evaluation (see Figure 3).
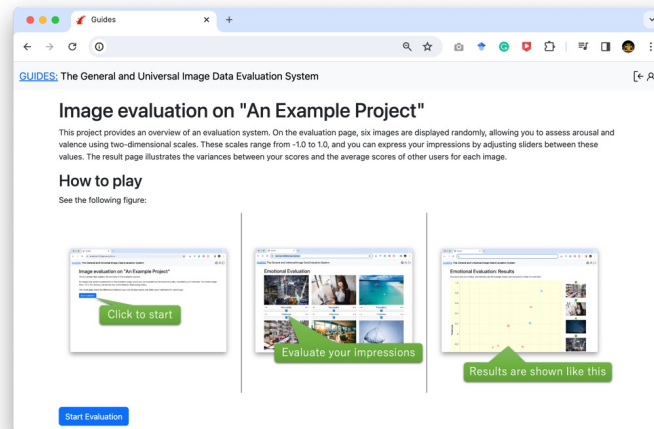

Figure 3: Introduction page can be designed using markdown notation.

On the evaluation page, six images, randomly selected from the database, are presented along with two evaluation scales ranging from -1.0 (negative value) to 1.0 (positive value). Users can assess their impressions of each image using a two-slider interface (Figure 4).
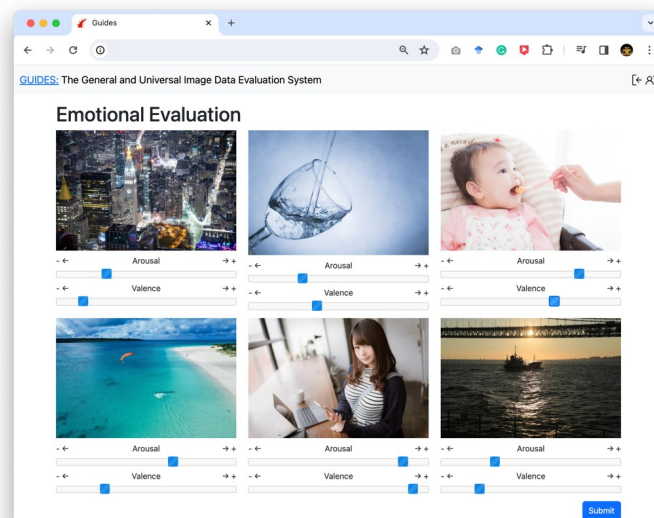

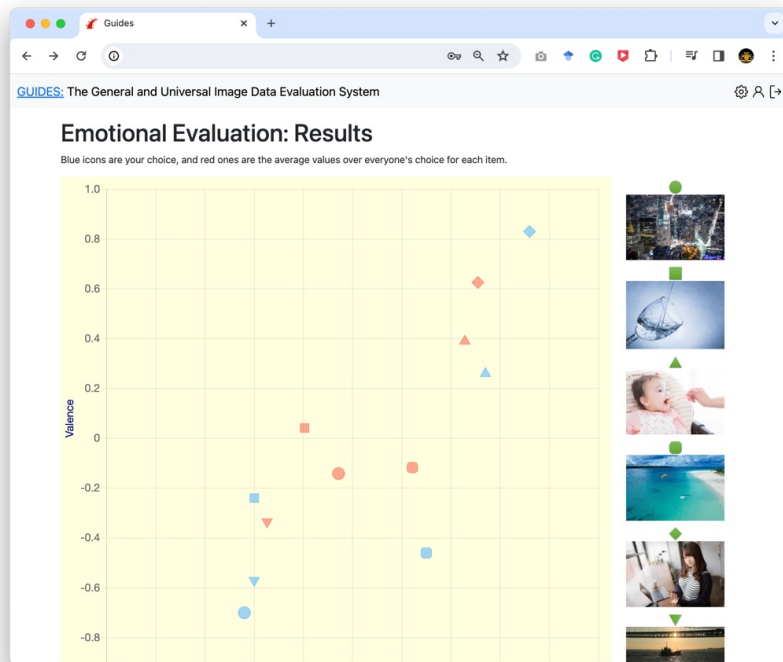**Figure 4**: Evaluation page contains six images with evaluation sliders.

Figure 5: Evaluation results are displayed using a scatter-plot graph. In the graph, blue icons denote the choice of the user, and red ones are the average values over everyone's choice for each item.

Upon submitting the evaluation, the resulting page was generated, featuring a scatter plot graph that illustrates the decisions of the user alongside the average scores calculated from other users for each image. Figure 5 shows an example of the emotional evaluation results. The results of the evaluations are shown as *blue icons*, and the average values are depicted as *red icons* in the scatterplot.

Administration Functions

As previously mentioned, GUIDES is a versatile platform for emotionally assessing user responses to image viewing. Consequently, registered users can conduct experiments, that include preparing target images, descriptions (including informed consent messages), and two-dimensional metrics. Individuals interested in designing projects must register an account to initiate this process.

After user registration, the portal page (see Figure 6) is displayed upon the successful login of a registered user into the system, allowing the user to create a project. A project includes a title, description, description of the information consent, and two measure titles, such as arousal and valence. In addition, the project encompasses a collection of resource addresses written in the uniform resource locators (URLs) format, corresponding to the images that need to be evaluated.
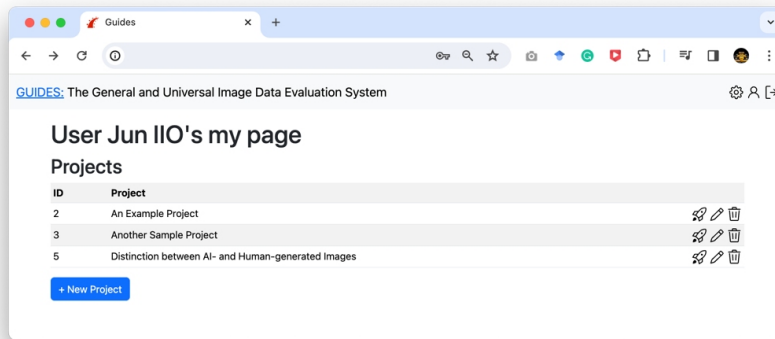
Figure 6: Registered user's portal page, where the list of projects appears.

Figure 7 shows the project information editor. The project designer can provide descriptions, metrics, and lists of the image URLs. The GUIDES cannot host the image data; therefore, the project designer must prepare the image data to be investigated elsewhere. The description and the informed consent message can be formatted using the markdown notation.

In addition to putting an image URL one by one, the image URLs can be configured collectively using a Microsoft Excel file.
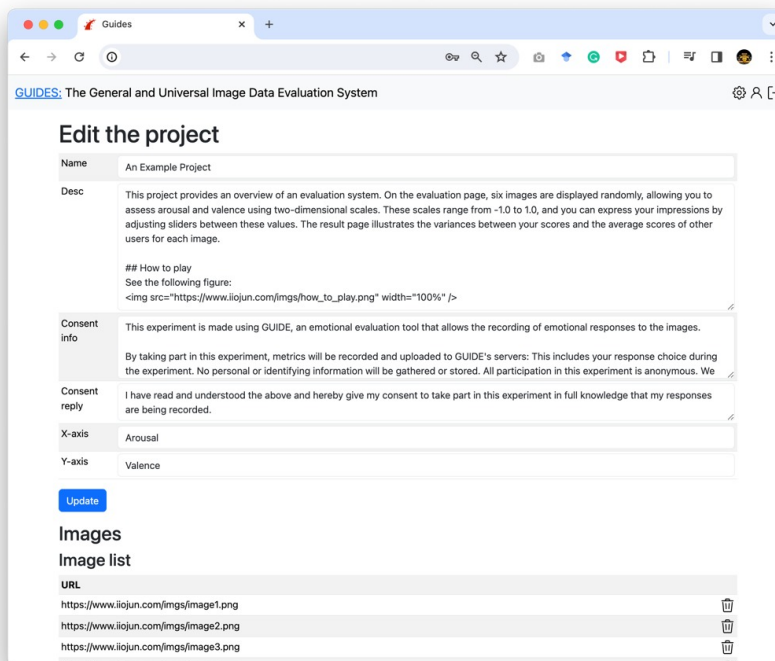

Figure 7: Project information editor.

CONCLUSION AND FUTURE WORK

This study introduced an enhanced system for the emotional assessment of images, originating from research focusing on user responses to movie posters that employed Russell's arousal-valence model. This novel system allows registered users to create and design projects for image evaluation using an open evaluation process comprising information consent, introduction, evaluation, and result display.

The system was implemented using Ruby 3.2.2, Rails 7.0.8, and SQLite3 database version 3.39.5. Its source code is freely available and hosted on GitHub[1].

As GUIDES is designed as a general-purpose emotional assessment platform, several experiences similar to those of the previously performed assessment of movie posters are currently planned by the laboratory members.

Performing emotional evaluations of paintings involves examining the ability of people to distinguish between human-created and artificial intelligence (AI)-generated artworks and determining their preferences. The experiment utilized a set of images comprising half human-drawn and half AI-generated images, prompting participants to evaluate them based on their humanness and preference. By plotting the results on two axes, we can analyze the images preferred by humans and AI and explore the discernibility of AI-created art (Bellaiche et al., 2023).

Similarly, a sensitivity evaluation of fashion is underway, utilizing two indices: fashion ability and likability. Participants will be asked to rate fashion items based on these criteria, elucidating the the styles deemed fashionable and preferred by individuals and providing insights into the variations in personal sensibilities. Additionally, collecting data on the age of the participants allows for the analysis of preferences across generations, thereby broadening the scope of the study.

ACKNOWLEDGMENT

REFERENCES

Bellaiche, L., Shahi, R., Turpin, M. H., Ragnhildstveit, A., Sprockett, S., Barr, N., Christensen, A. and Seli, P. (2023). Humans versus AI: whether and why we prefer human-created compared to AI-created artwork. *Cognitive Research: Principles and Implications, 8*(1), 42.

Hanagaki, T. and Iio, J. (2023). Emotional Evaluation of Movie Posters, *The 21st International Conference on e-Society (ES2023)*, pp. 428–431, Lisbon, Portugal.

Kuppens, P., Tuerlinckx, F., Russell, J. A., and Barrett, L. F. (2013). The relation between valence and arousal in subjective experience. *Psychological bulletin, 139*(4), 917.

Kutsuzawa, G., Umemura, H., Eto, K., and Kobayashi, Y. (2022). Classification of 74 facial emoji's emotional states on the valence-arousal axes. *Scientific Reports, 12*(1), 398.

Russell J. A. (1980). A Circumplex Model of Affect; *J. of Person. and Soc. Psychol.* 39(6), pp. 1161–1178.

---

[1] https://github.com/iiojun/guides