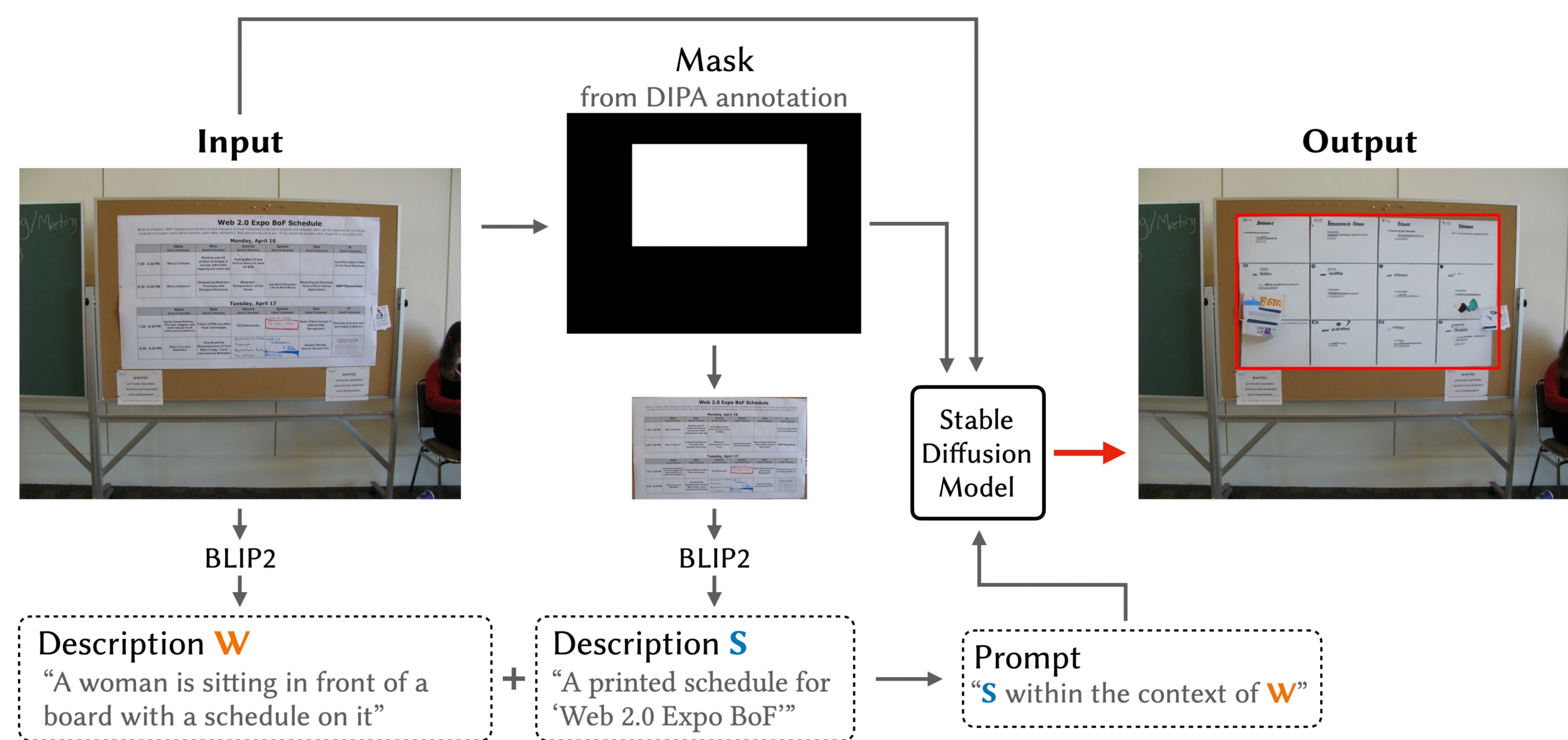


Examining Human Perception of Generative Content Replacement (GCR) in Image Privacy Protection

Background:

Image obfuscation is critical as one of the direct approaches to privacy protection before image sharing. Existing methods, such as blurring, may significantly diminish both the usefulness of images and the willingness to share when they protect privacy threats in images. Therefore, we aimed to develop a novel method of image obfuscation, **generative content replacement (GCR)**, that can **preserve the usability of images and ensure the effectiveness of privacy protection**.

Workflow:



Research Questions:

- RQ1:** To what extent can viewers detect the edits with GCR (**detectability**)?
- RQ2:** To what extent can viewers identify original content from images edited with GCR (**vulnerability**)?
- RQ3:** How well do images processed by GCR perform using common evaluation metrics derived from related image protection research?

Example:



Comparative Studies on Edit Methods:

- 270 Images from DIPA2**
 - Each contains one of the **23** privacy threats defined in DIPA2, an image privacy dataset.
- Four Reference Methods (Blurring, Cartooning, Colorfilling, and Removal) to be compared**
- 1350 edited images in total**
- Recruited participants in Prolific**
 - Each participant reviewed **10** random edited images per participant.

Questionnaire:

- Q1-1:** If the edits **can be detected**.
Response: Yes / No
- Q1-2:** Click the edited parts.
- Q1-3:** Perceived **difficulty** of edit detection.
Response: 1 2 3 4 5 6 7
Easy Difficult
- Q2-1:** Perceived Confidence in **Edit Vulnerability**.
- Q2-2:** Perceived Confidence in **Maintaining Narrative Coherence**.
- Q2-3:** Perceived **Visual Harmony** with Original Images.
- Q2-4:** Perceived **Overall Satisfaction** on Edited Images.
Responses above: 1 2 3 4 5 6 7
Disagree Agree

Highlighted Results:

- 60% of GCR edited images **could not be detected**.
- Participants think it was the **most difficult** to detect to rest of GCR-edited images.
- GCR gained the highest score of **visual harmony** and **overall satisfaction**.

Future Directions:



Comparative Studies on SNS Sharing Scenarios

More About This Research:



Paper



Code



Let's Connect!

Anran Xu, Shitao Fang, Huan Yang, Simo Hosio, Koji Yatani

RIISE

インクルーシブ工学連携研究機構
Research Institute for an Inclusive Society through Engineering

