

Novel Algorithms and Tools for Empowering People Who Are Blind to Safeguard Private Visual Content

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Challenge

- Blind people regularly use personal devices to take pictures and videos and share them with others
- Yet, they must risk their visual privacy in ways that sighted people do not

Private information shown in images taken by blind people.

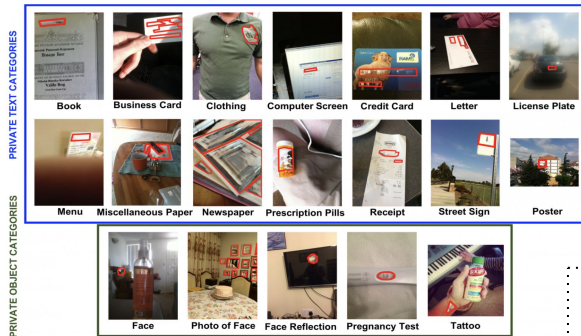


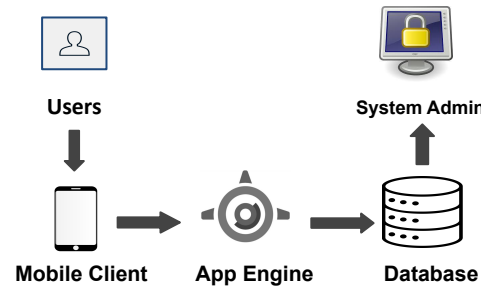
Figure 1. Nineteen types of private information found in images taken by blind people (Gurari et al., CVPR 2019).

Solution

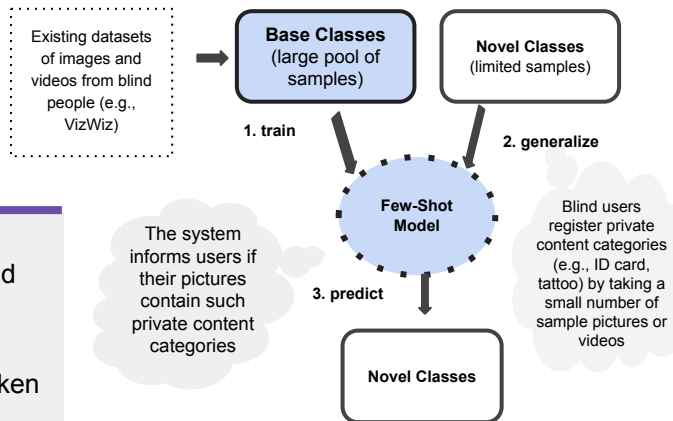
- User-centered research to identify expectations of privacy preservation and app features
- Construct novel datasets that are representative of images and videos taken by blind people
- Develop few-shot learning algorithms to identify private visual content

Approach

Dataset Creation Study



Few-Shot Learning Algorithm



Broader Impact

- Providing tools for blind people to control their private visual content
- Establishing protocols for creating datasets that involve private content
- Contributing a dataset that facilitates the development of privacy recognition and detection algorithms.

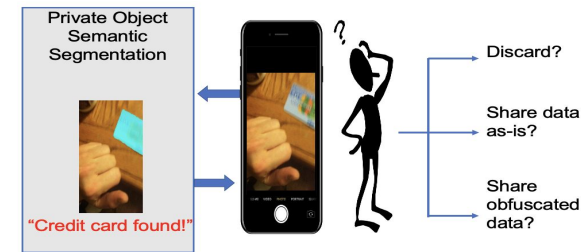


Figure 2: Illustration of envisioned user interaction pipeline for empowering users to safeguard private content in their picture and video.

Scientific Impact

- Novel user-facing visual privacy assistance tool that is accessible and engenders appropriate trust in the tool
- Understanding blind users' expectations of how to safeguard their private information

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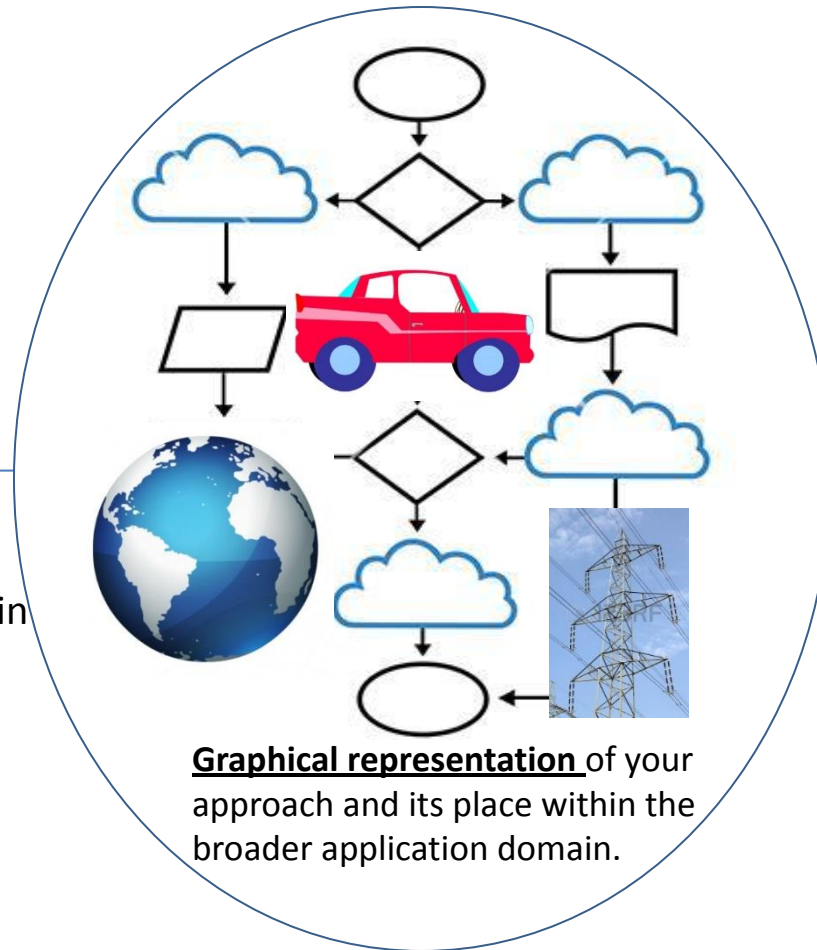
Challenge:

- Key problem(s) to be addressed and their significance.

Solution:

- Technical approach, in brief
- Highlight *key innovations* (new contributions)

Project info (number, institution, contacts,...)



Scientific Impact:

- How might the project contribute to solutions to security/privacy problems?
- How might the project improve the research community's understanding of security or privacy

Broader Impact and Broader Participation:

- What is the impact on society? Who will care?
- Possible transition to practice?
- Education and Outreach
- Quantify impacts if possible

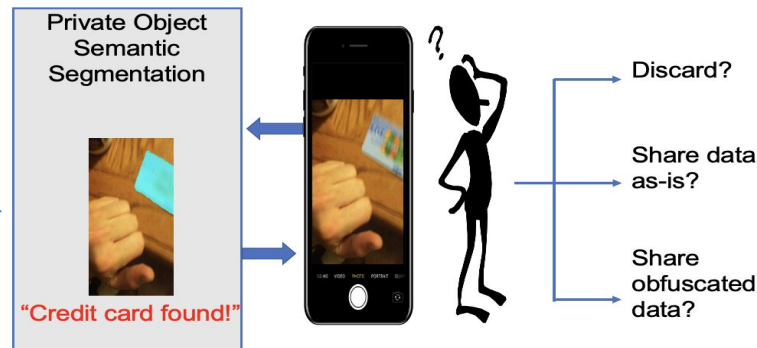
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Challenge

- Blind people regularly use personal devices to take pictures and videos and share them with others, but must risk their visual privacy in ways that sighted people do not

Scientific Impact

- Novel user-facing visual privacy assistance tool that is accessible and engenders appropriate trust in the tool
- Blind users' understanding of Private content and dataset collection method with ethics



Solution

- User-centered research to identify expectations of privacy preservation and app features
- Construct novel datasets that are representative of images and videos taken by blind people
- Use datasets to develop few-shot learning algorithms to identify Private Visual Content

Broader Impact and Participation

- Supporting Blind People to have control in Personal Private Visual Content
- Informing future dataset collection that involve private content and contributors with disabilities
- Contributing dataset that facilitates future Computer Vision Tasks

Project ID:

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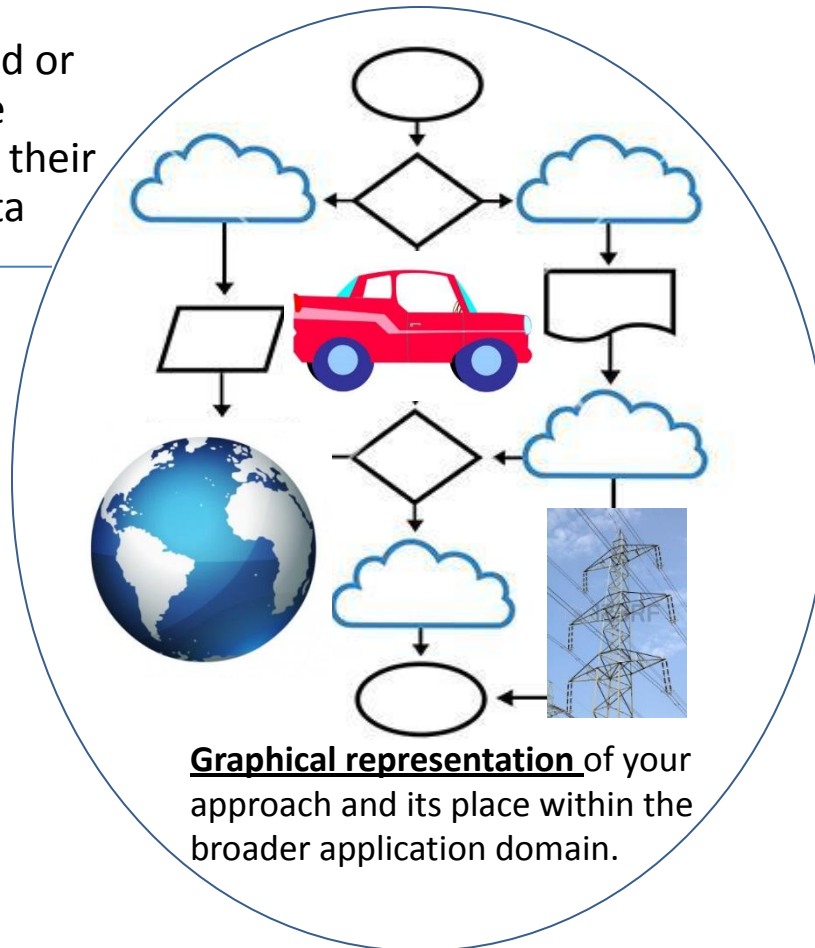
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Challenge:

- People who are blind or have low vision take images that contain their private personal data

Solution:

- User-centered research to identify expectations of privacy preservation and app features
- Construct novel datasets that are representative of images and videos taken by blind people
- Use datasets to develop few-shot learning algorithms to remove PVC



Scientific Impact:

- How might the project contribute to solutions to security/privacy problems?
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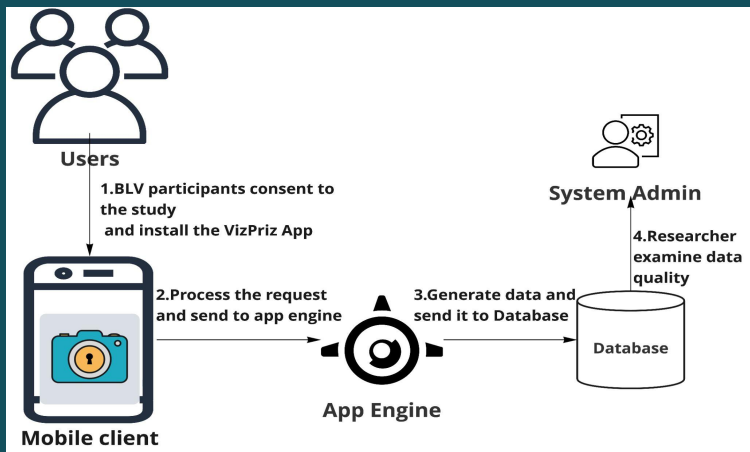


Figure: Mobile application to facilitate the collection of images and videos from blind and low vision users (implemented with defined data retention period and user consent mechanism)