VISUAL SECURITY & SAFETY (VSS)

Authors

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Introduction

- Private visual content exposes sensitive information that can be detrimental.
- Mitigation techniques protect users on social media networks.
- VSS is an application that can be enabled and disabled by the user to protect them every time they open apps that have permission to access the camera.

Category	# of Images Collected
Severe	160
Moderate	327
No risk	18,264

Table 1. Risk Classification From Web Scraping via Twitter

Category		Keyword (Count)	
Severe	(160)	Baby	71
		Driver's License	12
		Financial Document	2
		Hospital	54
		Job	4
		Keys	4
		License Plate	1
		Medication	10
		Medical Records	6
Moderate	(327)	Baby	45
		College Letter	6
		Driver's License	24
		Hospital	123
		Job Promotion	7
		Medical Information	52
		Medication	43
		Work Identification	12
		Workplace	15

Table 2. Distribution of Content for Risk Categories. This table lists the frequency of the content within the Moderate and Severe categories

Methodology

- Using Mitigation Technique 1: Client-Side (**Figure 2a**)
  - Third-party application with various SMN applications on electronics to prevent the user from posting potential leaks. This application will pre-screen visual content.
- Using Mitigation Technique 7: Interception (**Figure 2g**)
  - Users will agree to let the SMN intercept the camera and gallery to flag and block content that should not be selected for posting.
- Object Detection Model **(Figure 1)**
  - Collect visual data that will be used to train the object detection model.

Figure 1

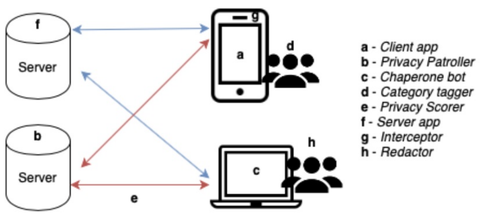
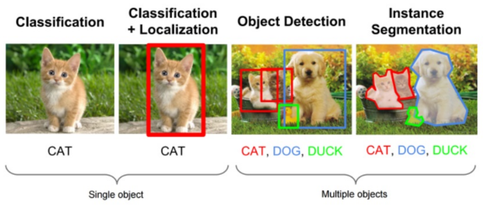


Figure 2



Mitigation techniques can be used to keep users safe on Social Media Networks (SMNs) considering that people will continue to leak visual private information knowing and **unknowingly.**

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For more information about the VIPER project and affiliated works

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This research is supported in part by OK-LSAMP and the School of Computer Science.
Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the supporters.

Implementation

While the user is using apps that have permission to access the camera the application will monitor what is placed in the front or back camera of the device. If sensitive information is detected, then a warning will pop up on the screen (**Figure 3**). The only way to re-enable the normal functions of the phone is if the user does one of the following three things:

- Removes the sensitive information from the camera
- Leaves the app
- Locks the phone

Privacy Considerations

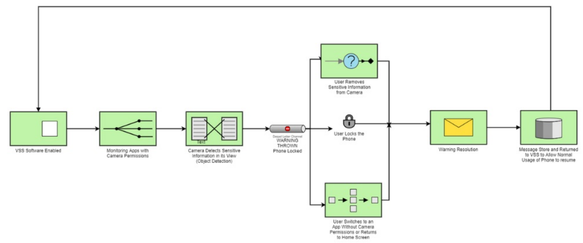
- We will only monitor user's cameras when they access apps that already have camera permissions.
- The app will ask for access to monitor users' cameras when they are accessing apps that have camera permissions to ensure they aren't knowingly or unknowingly leaking visual private information.
- Users can enable and disable the app if they do not want their information monitored. This will allow users' phones to function normally without the fear of monitoring.

Conclusion

VSS Software will be used to protect users from visual privacy leaks and ensure their safety while enjoying modern technology. Because users have full control over rather the app is or is not enabled, the user will feel like their privacy is being respected. This form of mitigation will continue to allow for future advancements and protection.

Figure 3

Figure 4



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