Beyond Mobile Devices:
A Cross-Device Solution for Smishing Detection and Prevention

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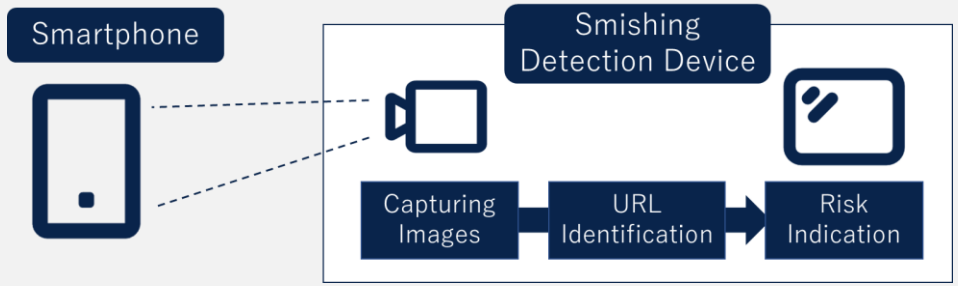
Smishing

Smishing, a phishing attack through SMS, has become a significant security concern.
Attackers send fraudulent messages, including malicious URLs leading to personal information theft or malware infection. Current security mechanisms on mobile devices, such as anti-virus apps, are limited in detecting and preventing smishing attacks.

Cross-Device Smishing Detection

Another device (Ex. AR glass) inspects the message displayed on the smartphone to evaluate URL maliciousness

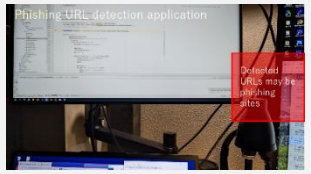
- Check the **database of malicious URLs** to see if the URLs are listed.
- Access the URLs in the **sandbox** and **dynamically analyze** their risk.
- Performed **without risk to the user's device**.



Many **glass-type AR devices (AR glass)** are being developed. They are beginning to be used in various fields for entertainment, and **enterprise applications in training, education, and work support**. If AR glasses become commonplace, **security solutions across multiple devices** will become natural, and the mechanism proposed in this study will be welcomed with realism.

Prototype Implementation

- **AR glass**: EPSON Moverio BT-30ES
- **String extraction**: Google ML Kit API
- **URL evaluation**: simple list matching, with locally stored malicious URL list
- **Alert UI**: A **red box** is displayed if the URL is classified as malicious, otherwise a green box is displayed.

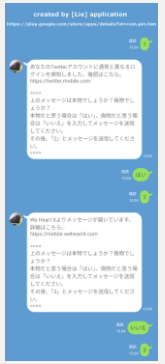


Alert UI

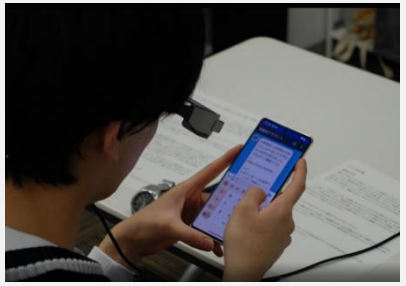
Prototype (Moverio BT-30ES)

User Study

- **Task**: Participants judged **36 incoming messages** as malicious or not
- **Use of the Prototype**: First 18 messages unused, second 18 messages used
- **Survey**: SUS
- **Semi-structured Interview**
- **Participants: 9** **(University students studying computer science)**



Incoming messages



Tasks being performed

Result

- Percentage of correct judgments being **85.19%** when using AR glasses compared to **46.3%** when not using AR glasses.
- The SUS score for the AR glass prototype app was **74.4**
- Semi-structured interview results:
  - "**myself**","**decision**"
  - Users' difficulty making decisions by themselves
  - Did not trust SMS messages in the beginning
  - Wearing AR glasses was fine until they became accustomed to making judgments

Findings

- Tend to **trust the prototype app** due to the immersive nature of AR glasses
- Need "**Alert UI for HMD**"
- Inaccuracies caused by the **camera position of AR glasses**