Vetting Privacy Policies in VR: A Data Minimization Principle Perspective



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Motivation

- > VR can harvest users' sensitive personal information [1].
- > Users have the *right to know* what information are collected by VR applications.
- > Typically, this is conveyed by apps' privacy policies.

System overview



> Data minimization principle should also be satisfied when VR

apps collect uses' data.



Research Question

Whether VR apps' privacy policies comply with data minimization principle?

Recognize CSPs in privacy policy and formalize these dataobjs to pre-defined types (Class-I and Class-II)

Overbroad dataobjs analysis

> High-risk: overbroad collection of a Class-I dataobj (e.g.,

biometric data, health information)

Data Minimization

- Legal definition: "Adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed." However, it is hard to judge.
- > We utilize counterpart-based method from PolicyComp [2].
- > A data collection/sharing practice (CSP) is thought to be overbroad if majority of apps' counterparts do not collet it.
- > Insights behind this method:



> Medium-risk: overbroad collection of a Class-II dataobj

(e.g., email address, phone number)

Evaluation and Conclusion

- \succ In total, we find counterparts for 1,351 VR apps, and extract 1,534 CSPs from 497 valid VR privacy policies.
- > 48.1% VR apps have at least one overbroad CSP, hence potentially violate data minimization principle.
- > Overbroad collection centralize on biometric data (Class-I), email addr., IP addr. and device ID (Class-II) for VR apps.
- > If a VR app collect physical address, it is more likely to be an

overbroad CSP than in non-VR scenario.

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References

[1] J. A. De Guzman, K. Thilakarathna, and A. Seneviratne, "Security and privacy approaches in mixed reality: A literature survey," ACM Computing Surveys (CSUR), vol. 52, no. 6, pp. 1–37, 2019.

[2] L. Zhou, C. Wei, T. Zhu, G. Chen, X. Zhang, S. Du, H. Cao, and H. Zhu, "POLICYCOMP: Counterpart comparison of privacy policies uncovers overbroad personal data collection practices," in 32th USENIX Security, 2023.