

Motivation

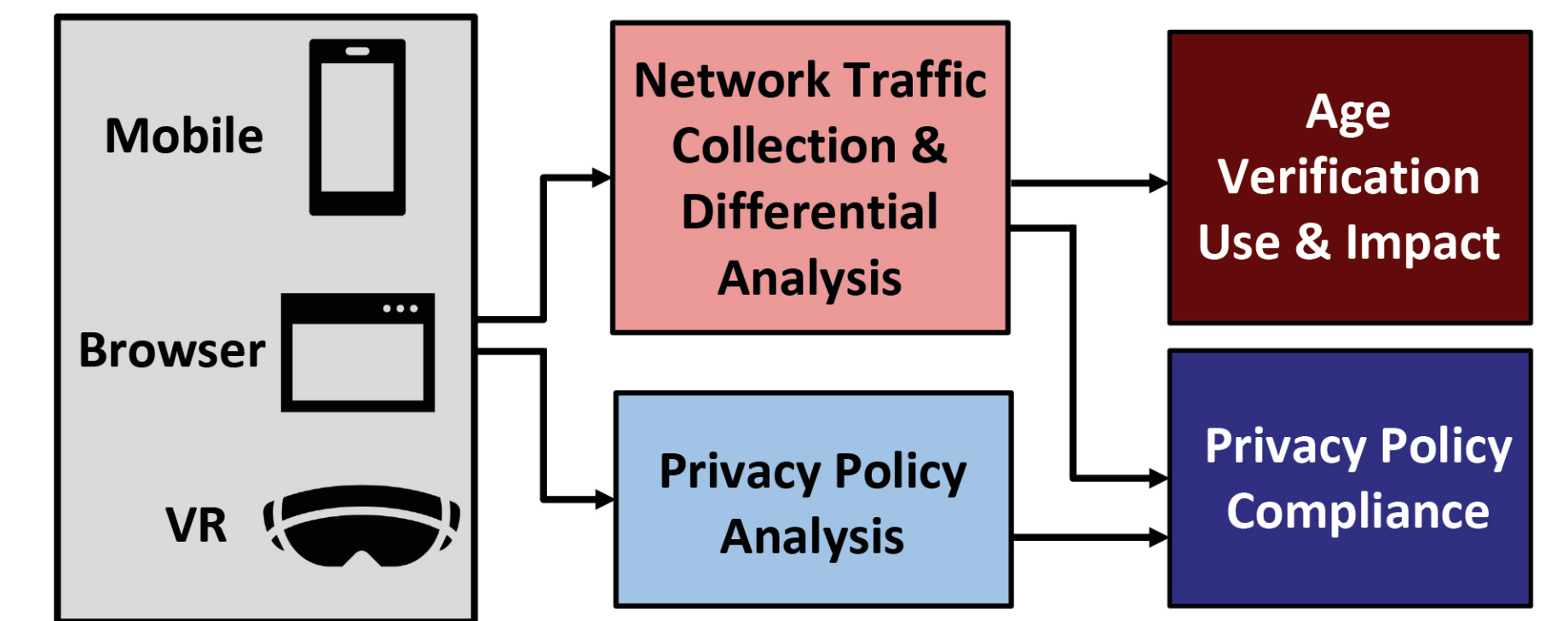
- Online services and devices regularly collect and share user data
- Lack of technical tools to enforce privacy legislation
- Children's privacy is critical, but age-based protections are too simple and easily evaded
- Age-gating and age verification must be studied and improved to protect children's privacy
- Inspired by internship at 



Auditing Network Traffic and Privacy Policy Compliance

Network Traffic Analysis: Conduct differential analysis of network traffic generated by websites, mobile apps, and virtual reality (VR) apps by inputting different ages in age verification tasks to assess whether data processing practices change. Use privacy laws (COPPA, CCPA, GDPR, etc.) and age-specific regulations from each to inform differential analysis and data flow audits.

Privacy Policy Auditing: Use network traffic data flows to verify corresponding privacy policy statements to determine compliance.

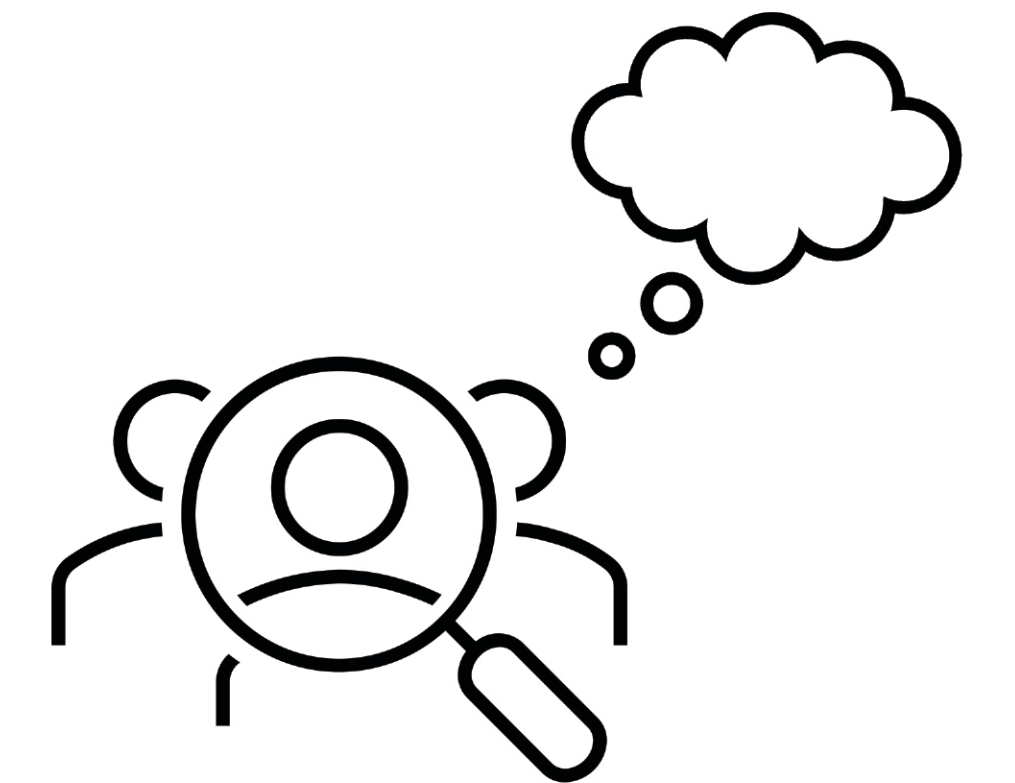


Children's Privacy and Age-Based Protections User Study

Framework: Interview- and survey-based user study to qualitatively and quantitatively gauge privacy literacy amongst families and effectiveness of age-based protections using scenario-based questions.

Impact of Privacy Education: Implement user prompting/training regarding online privacy to measure their impact on participants' responses.

Broader Impact: Results can inform the design of technical age verification tools and privacy education resources.



Goals

- Investigate current age-based protections:** Provide evidence on data processing practices for children users and privacy policy compliance
- Evaluate user privacy practices:** Reveal shortcomings of privacy literacy amongst families and age-based protections online
- Create better age verification:** Build cross-platform machine learning age prediction systems

Broader Impact

- Privacy Education Resources → Families
- Privacy-Enhancing Technical Tools → Developers
- Recommendations for Regulations → Lawmakers

Machine Learning Age Verification Systems

Cross-Platform Age Verification: Use machine learning to predict user age and supplant current online age verification systems for websites, mobile apps, and VR apps.

Natural Language Processing (NLP): Via user-inputted text, use NLP metrics to predict age of author. Website and mobile app developers can add NLP system to existing age verification systems or replace them.

Anthropometric Data in VR: Predict user age using anthropometric data sensed by VR device (interpupillary distance, height, wingspan, etc.). Users can install age prediction system as a plug-in to enhance parental controls.

