CAREER: Presentation and Mitigation of Privacy Risks for Online Users (CNS-1942014)

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https://wiscprivacy.com/project/notice_and_privacy/

Research Objective

Explore and address the challenges associated with developing interfaces to present and mitigate online privacy risks for users. Achieving this objective requires addressing two questions: *How can we design more usable interfaces?* And *How can we overcome the scalability hurdles that limit the adoption of these interfaces?*

Research Challenges

- Scalability hurdles for making privacy policies and settings accessible and reachable for users

- Heterogeneity, dark patterns, and non-uniform web design for extracting online privacy options

- Lack of understanding of the security and privacy attitude of the users in the wild

- Lack of privacy interfaces that accommodate the diverse needs of online users.

Scientific Impact

- A *methodology* to extract set of user-driven guidelines for designing privacy interfaces that are easier to adopt and use
- A comprehensive *framework* to make the privacy practices and controls of the service provider machine-readable
- *Interfaces* to allow users to inquire about privacy practices and enforce privacy settings using natural-language queries, even when interacting with UI-limited devices

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Exploring Privacy-Preserving Interventions for Voice Assistants

How to design bolt-on privacy-preserving interventions for smart speakers?

PowerCut   Obfuscator

Recommendations:
Aesthetics, Physical Footprint, Multi-Functionality, Ease of Deployment, Trust in Technology, Mode of Interaction, Informative Cues, Cost, Fine-grained Privacy Control, Awareness

Understanding Security & Privacy Attitudes of Smart Home Users

How do smart home users develop S&P considerations and attitudes?
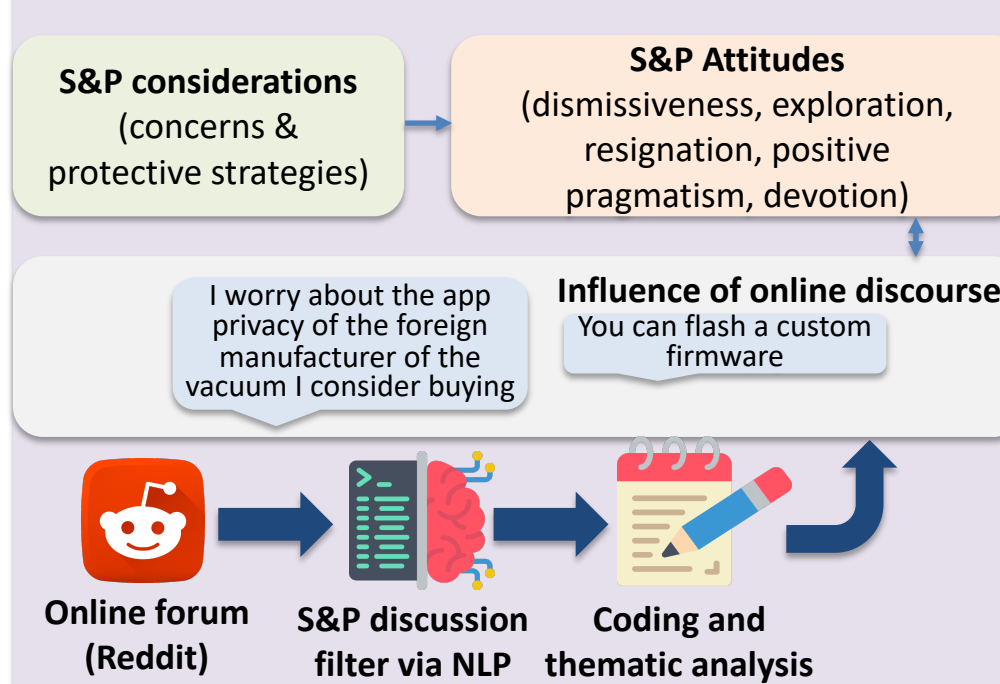
Recommendations:
- Transparent and flexible S&P design for different users
- S&P nudges via physical metaphors
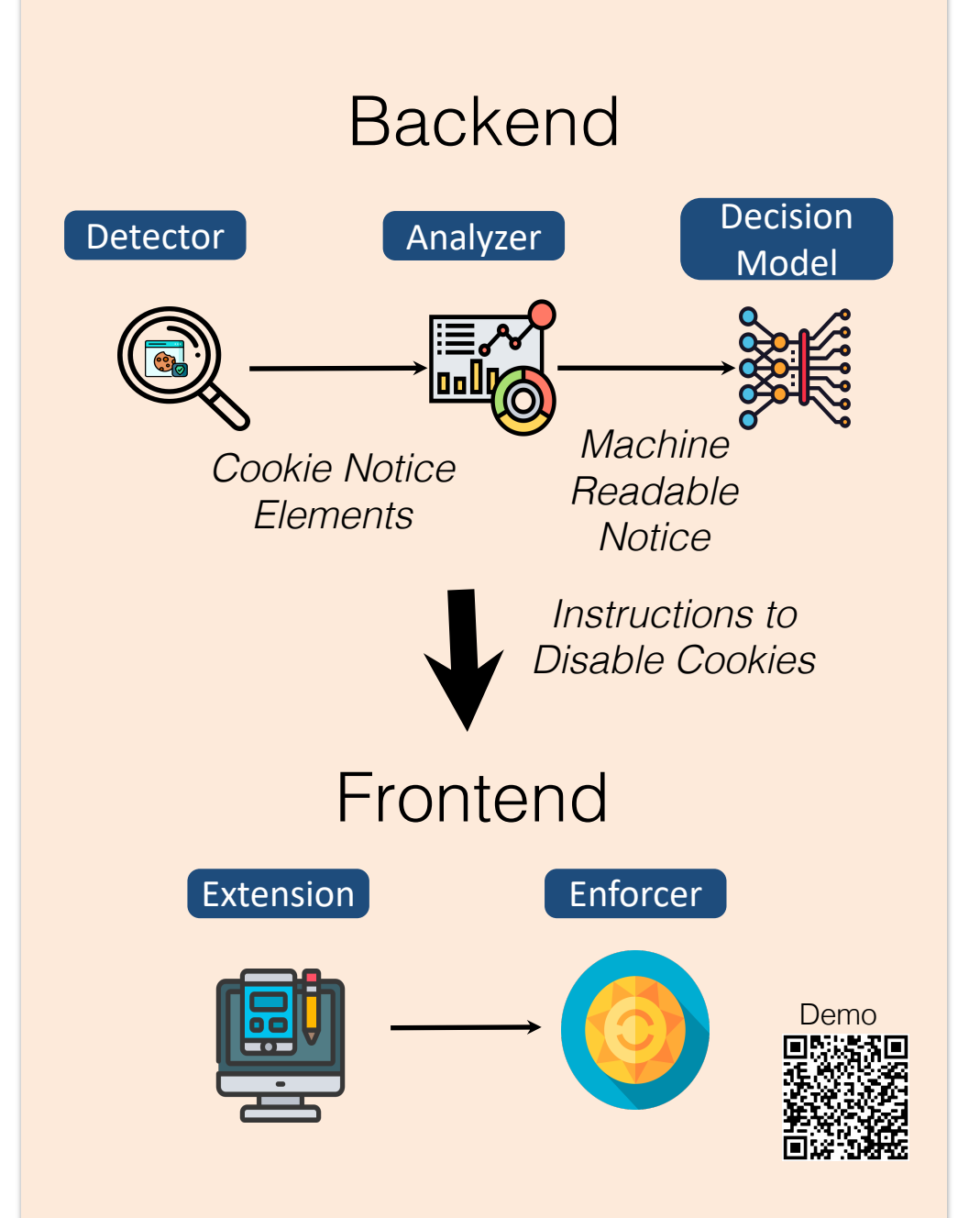- Automating the access of credible S&P information

PriSEC: Presentation and Enforcement of Online Privacy Settings

How to automatically surface privacy settings to users in an intuitive and usable interface?
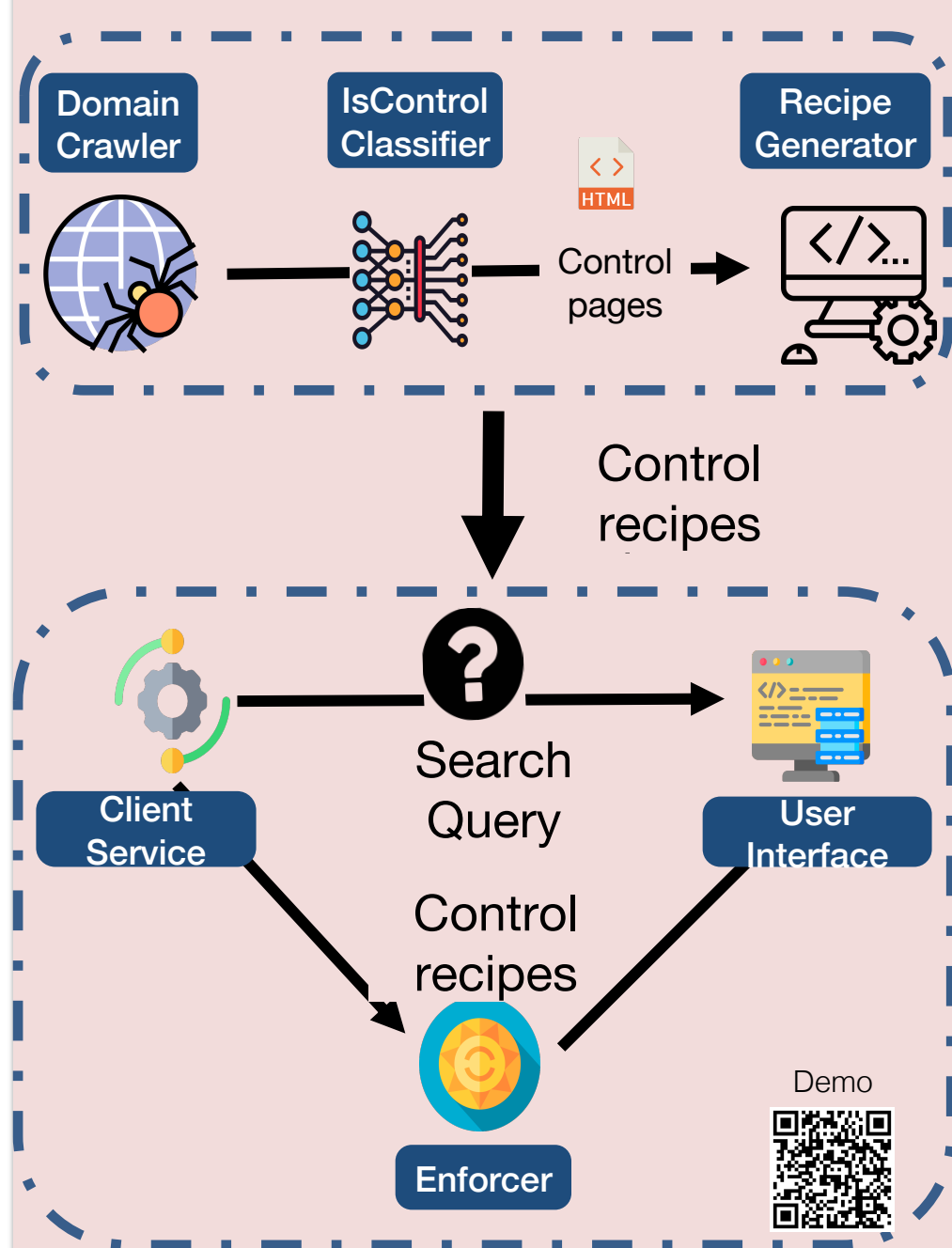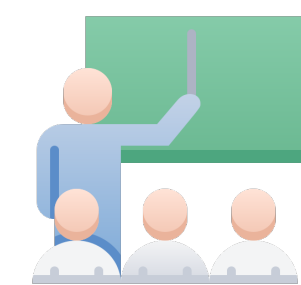

CookieEnforcer: Automated Cookie Notice Analysis and Enforcement

How to automatically determine the clicks needed to disable non-essential cookies?

Impact on Society

Dissemination of research results in major conferences	Open-source code bases and datasets

Media appearances by PI to inform the public about privacy issues associated with online services (local, national, and international media outlets)

Teaching

Privacy Modules in ECE capstone design classes about digital contact tracing	New graduate-level ECE/CS course about advanced security and privacy topics

College and campus-wide awards on teaching in 2021 and 2022

Broadening Participation

Recruited pre-law students to analyze Reddit threads on smart home privacy	Recruiting CS students from underrepresented groups via REU

Serving on ECE Department DEI committee to improve diversity of ECE graduate program