OVERVIEW

- -This work investigates the additional security and privacy risks which apply to people with visual impairments (VIs).
- We have found:
- -Inadequate accessibility regarding cookie notices.
- Overall negative sentiment towards cookie notices from users with VIs.
- A high degree of tracking and poor accessibility for web extensions.

- And security issues regarding screen reader plug-ins.

INTRODUCTION

- \rightarrow VI refers to a spectrum of vision impairments, ranging from partial vision loss to complete blindness [1, 2].
- \rightarrow Users with disabilities, including those with VIs, face different and varying challenges when using technology as part of their everyday life [3].
- \rightarrow Individuals with a VI have access to assistive technologies (AT), which can help them use technology; some examples include text-only browsers and screen readers [4].

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Security and Privacy of Assistive Technologies for PEOPLE WITH VISUAL IMPAIRMENTS

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COOKIE NOTICES

 \rightarrow At the start of my PhD, I investigated the interaction between AT and cookie notices via a set of system studies of 46 top UK websites and a user study of 100 users with VIs via Prolific Aca-

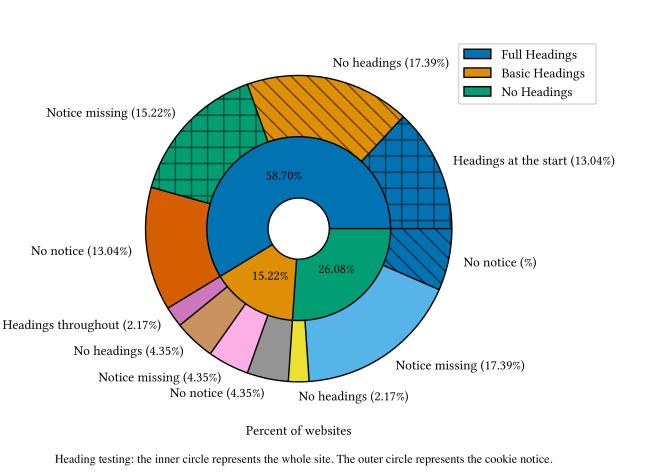
 \rightarrow We found that 22 of these websites had at least one issue with the accessibility of their cookie notice when manually tested using a screen reader.

 \rightarrow We also observed websites which did not have issues with their cookie notices when using AT but did include issues such as low contrast when viewing them graphically.

 \rightarrow These practices often create accessibility issues when trying to read and respond to cookie notices.

 \rightarrow The results of our user study revealed that users with VIs overall have a negative view of cookie notices.

 \rightarrow We also found that all users believe that at least one of our recommendations would help improve their experience online. These recommendations are outlined in our paper.



 \Rightarrow WebbIE accessibility testing; inner circle: the whole site, outer circle: the cookie notice.

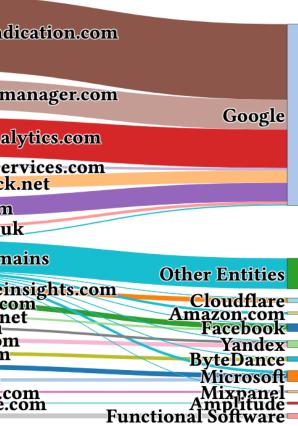
WEB EXTENSIONS

- \rightarrow This work presents AXECC, a novel framework to measure differential web tracking and accessibility risks.
- tracking and accessibility impact of 21344 real world extensions, which are collected from the Chrome Web Store. we collect perform web tracking, however, this is likely a lower-bound. Additionally, extensions which track often make multiple tracking requests. These extensions have over 540M users.
- \rightarrow We utilise *AXECC* to analyse the web \rightarrow We find that 15.77% of the extensions
- \rightarrow We identify that extensions from the Games and Shopping categories commit a large proportion of the tracking we observe.
- \rightarrow Further, we identify that tracking extensions, on average, request more permissions.
- \rightarrow Further, we find that 3.01% of the extensions we collect altered the accessibility of the webpage when browsing. We discovered a strong correlation between the impact on the accessibility score and third-party tracking. These extensions have over 63M users.

Category	Domain
Games	googlesynd
Household Art & Design	googletagn
Just for fun Entertainment	google-ana
Accessibility Wellbeing	googleadse
Shopping	google.com google.co.u
Social Networking Functionality and UI Travel	Other Dom
Workflow and planning	cloudflarei facebook.c
Developer Tools Education	facebook.n yandex.ru yandex.cor
Tools News & Weather Privacy & Security	tiktok.com bing.com clarity.ms mixpanel.c amplitude.
Privacy & Security Communication	sentry.io

 \Rightarrow Mapping of Trackers, from Extension Categories to **Domains to Domain Owner**





SCREEN READER Plug-Ins

- \rightarrow Our research reveals that it is possible to create harmful software that masquerades as a screen reader plug-in.
- \rightarrow We used NVDA, the most popular screen reader, as a test bed to demonstrate this possibility.
- \rightarrow We implemented seventeen different techniques across ten tactics from the ATT&CK framework, such as input capture, clipboard access, ransomware, and cryptojackers.
- \rightarrow In addition, we provided suggestions to address our findings.
- \rightarrow Furthermore, we have informed NV Access, the developers of NVDA, about our discoveries and are collaborating with them to enhance the security of their software.

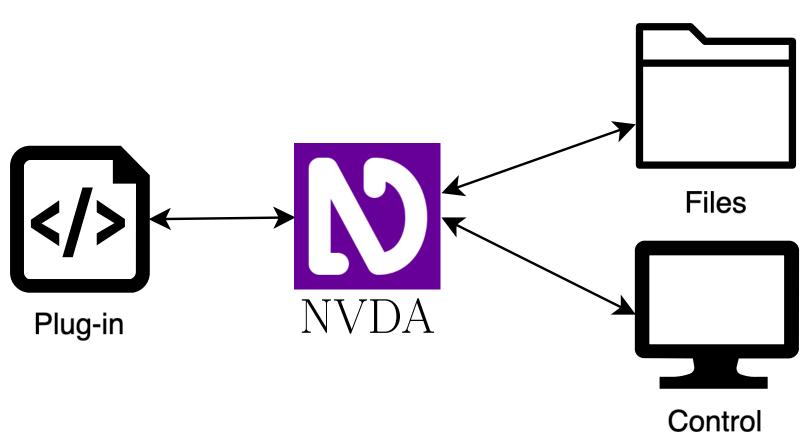


Figure 1:Plug-in interaction diagram

FUTURE WORK

- \rightarrow We are currently working with the makers of NVDA to find a solution to the issues we have found.
- \rightarrow We further plan to extend our work to look at JAWS, the other popular screen reader for Windows.

CONCLUSION

Our work highlights the additional risk for users with visual impairments when using digital technologies regarding security and privacy.

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More Info

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