

Research Interests

- Usable Security** I am interested in investigating approaches to enhance the security of systems and information while prioritising a user-centric design. My research aims to make security more accessible and intuitive for end-users.
- Digital Accessibility** My research investigates creating inclusive digital environments for people with diverse abilities, concentrating on eliminating barriers and improving usability. Currently, I am specifically investigating issues for users with visual impairments.
- Security and Privacy** My research investigates Security and Privacy in various environments. I am currently working on multiple projects looking at privacy and security online, on desktop computers, on mobile, and with IoT devices.

Education and Career

- 2022–present **PhD Computer Science**, *University of Surrey and Durham University*
Investigating the security and privacy of assistive technologies (ATs), such as screen readers and browser extensions, for people with visual impairments. This research aims to shed light on the potential vulnerabilities and privacy concerns associated with these ATs, recognising their critical role in enhancing digital accessibility for individuals with visual impairments. The ultimate deliverable of this project is a privacy-enhancing and human-centric platform that protects visually impaired users against various attack vectors in different environments (i.e. web browsing, screen readers and connected devices).
- 2021–2022 **MSc Cyber Security**, *Newcastle University, Distinction*
Focusing on a wide range of computer science fields, including Security & Reliance, Dependable Systems, Cybercrime and Cloud Computing. Dissertation in Visual Impairments and Privacy-Enhancing Technologies.
- 2017–2020 **BSc (Hons) Computer Science**, *York St John University, First Class*
Studying programming, maths, databases, networking, HCI, mobile application development, IoT and cyber security. My dissertation was based on invasive advertising, tracking, and online privacy.
- 2019 **Research Assistant**, *York St John University*
During the second year of my undergraduate degree, I was allowed to hone my research skills when working as a research assistant for Dr David Zendle during his time at York St John University. This opportunity afforded me a greater insight into the process of research and academic inquiry. Through this, I developed a positive relationship with my supervisor, which gave me experience in working alongside academics. This rapport also further developed my enthusiasm for the subject and challenged me to rethink my own online presence.
- 2010–2017 **A-Levels and GCSEs**, *Whitburn Church of England Academy*
A-Levels: Computer Science, Art and Physics. GCSEs: 11, including Mathematics, English and Science.

Publications

- 2024 **Invisible, Unreadable, and Inaudible Cookie Notices: An Evaluation of Cookie Notices for Users with Visual Impairments**, *ACM Transactions on Accessible Computing*. This study explores the accessibility of cookie notices on leading UK websites for users with visual impairments (VIs). Analysing 46 websites through system studies and a user study with 100 participants, the research uses various methods, including accessibility testing tools and screen readers. The results reveal that a majority of the examined websites' cookie notices present accessibility challenges, such as contrast issues and delayed reading aloud. The study discusses the implications on user experience and privacy, offering recommendations for stakeholders to improve website accessibility and privacy practices for users with VIs. The user study highlights negative perceptions of cookie notices among individuals with VIs, supporting the idea that implementing the recommendations could enhance their online experience. Additionally, a disparity is identified between users' preferences in responding to cookie notices and their actual behaviour.

Under Review **AXECC: Differential Web Tracking and Accessibility in Browser Extensions.** Browser extensions are commonly used to improve the browsing experience and accessibility. However, installing extensions naturally increases the user's risk. This work presents AXECC, a novel framework to measure differential web tracking and accessibility risks. We utilise the AXECC framework to analyse the web tracking and accessibility impact in the wild on 21k real-world extensions collected from the Chrome Web Store. In our analysis, we identify that 15.77% of extensions (with more than 540M installs) perform a type of third-party tracking in the first 60 seconds after loading. These results are highly correlated with the extension category, highlighting the differential risks. Furthermore, we find that a small number of extensions (with 63M installs) alter the accessibility of a webpage when browsing, and these alterations are often complex and involve more tracking.

Teaching and Demonstrating

2023–present **Demonstrator**, *University of Surrey*

During the spring semester of 2023, I served as a demonstrator for the 'COMM047' Secure Systems and Applications module at the University of Surrey. I provided assistance to both in-class and extracurricular students, collaborating closely with Dr. Rizwan Asghar and Dr. Ehsan Toreini. My responsibilities included updating lab materials and resolving exercise-related challenges.

Then, in the spring term of 2024, I continued my role as a demonstrator for 'COM3014' Advanced Challenges in Web Technologies. I worked alongside three other demonstrators to support approximately 150 students in their in-class learning. In addition to this, I provided mentorship to eight teams throughout their group projects.

Additionally, for two years, I worked as a demonstrator for the 'COM3017' and 'COM037' Information Security Management modules. Working as part of a team, we supported over 200 students.

Finally, I worked as a demonstrator for 'COM3030' Privacy Enhancing Technologies, helping to fix technical issues and support students understanding.

2024 **Invited Lecture**, *Royal Holloway, University of London*

I was given the opportunity to deliver an invited lecture for the module Human Aspects of Information Security and Privacy at Royal Holloway, University of London. For this lecture, I created original material based on one of my papers and delivered it over the course of two and a half hours.

2021–2022 **Technical Officer**, *Newcastle University Cyber Society*

I created, delivered and supported technical sessions for the Newcastle University Cyber Society. I also led some sessions, including investigating breaking the Enigma cypher and giving a detailed breakdown of the OWASP Top Ten. As well as helping to run and manage social events.

2018 **Tutor**

During the first year of my degree, I tutored a fellow student. I worked to help him gain a deeper understanding of programming and the theorem behind it. This involved me putting together short theory lessons, followed by practical programming tasks, which we then worked through together. I found it really rewarding seeing him become more confident in programming.

Awards

2024 **Poster Competition Finalist**, *Computer Science Research Center, University of Surrey*

I was honoured to be one of the top 8 finalists for my department's post-graduate researcher poster competition.

2024 **Departmental Funding**, *Computer Science Research Center, University of Surrey*

I received funding from my department to present my work at the Privacy Enhancing Technologies Symposium.

2023 **Scholarship**, *FOSAD Summer School*

I received a scholarship to attend the International School on Foundations of Security Analysis and Design (FOSAD). As part of this, I presented my work on the Evaluation of Cookie Notices for Users with Visual Impairments.

Academic Commitments

2024 **Poster Presentation**, *Privacy Enhancing Technologies Symposium*

I was invited by the PETS chairs to submit a poster. This led to creating and presenting a poster summarising my PhD journey so far.

2024 **Supporting MSc Project Supervision**, *Royal Holloway, University of London*

Working alongside a member of staff at Royal Holloway, University of London, I supported work on an MSc project looking at the security and privacy of existing add-ons for the NVDA screen reader.

2023–2024 **Sub Reviewer**

I have acted as a sub-reviewer of the International Journal of Human-Computer Interaction (Taylor and Francis) and as a sub-reviewer for STAST'23 (Socio-Technical Aspects in Security Affiliated with the 8th IEEE European Symposium on Security and Privacy).

2023–2024 **Presenter, CyberMi2**

During the first CyberMi2 event, I presented my research on the accessibility of cookie notices for users with visual impairments. Then, during the second CyberMi2 event, I gave an overview of my PhD work at that time.

Other Experience

2018–2022 **Team Coach, Next plc.**

Beginning as a sales assistant in York, I quickly advanced to the roles of Team Coach and Sales Consultant within a year, I then continued these responsibilities in South Tyneside. In my capacity as a Team Coach, I used my leadership skills to foster team dynamics and provided guidance and support while adapting to the fast-paced work environment.