Melvin Abraham

Email: (link) GitHub: (link) LinkedIn: (link) Google Scholar: (link)

I am a PhD student working on understanding threats to privacy and security within extended reality, in order to build user-centered mitigations. I am passionate about security and stand by my belief that '*If something is not usable, it will not be used*'. My goals are to create solutions that will make security more usable to the general public and make people safer online.

Computing Related Work Experience

Conference Web & Online Platform Chair: Scottish Informatics and Computer Science Alliance (SICSA)

July 2021 – September 2021

I was responsible for creating and managing the online platform used for the SICSA Conference 2021, attended by 170+ people. This role allowed myself to provide creative and technical direction. I communicated with both internal and external stakeholders to gather and understand requirements to deliver appropriate personalised solutions.

Intern Cyber Security Research: Heriot-Watt University

July 2020 – October 2020

Created a web app using Angular to collect account structure data used to analyse how protected a specific person's valuable accounts are under potential attack scenarios. Another responsibility was to create designs maintaining the privacy and anonymity of participants, keeping personal data and sensitive data separate. This project has allowed me to read up on academic research on user authentication and identity management, learn new technologies and to apply rapid prototyping methodologies.

To see the code: (link)

Information Security Lab Tutor: University of Dundee

October 2020 – Dec 2020

I was responsible for multiple weekly technical labs for 80+ students. As part of this role, I created video content explaining cyber security concepts such as: encryption, web attacks, virus creation/detection and modular arithmetic. I taught students complex concept of the module one to one such as symmetric/asymmetric encryption, protocols, hashing and passwords.

Education

Doctor of Philosophy – Computer Science, Cyber Security and Privacy

University of Glasgow (EPSRC Scholarship 2021) *Expected Graduation 2024*

Extended Reality is becoming more affordable and will soon become ubiquitous within society. However, today extended reality still poses security and privacy risks, to both users and bystanders. Such as data leakage via unencrypted channels or unconsented sensor data being collected through negligence or for malicious intent. My project works to automatically identify security and privacy threats within extended reality. Combined with creating usable human-centeric methods to leverage the unique capabilities of extended reality, such as immersion, to effectively communicate the risks to users and bystanders.

Applied Computing BSc (Hons)- First Class

University of Dundee *Graduated 2021*

Notable Modules:

- ***Users and Interfaces* UX/UI** - I gathered requirements using various qualitative research methods (interviews/focus groups) then subsequently designed accessible and usable interfaces for underrepresented population groups.

- ***Information Security*** - I studied applied cryptography, web security, security protocols and learned principles of secure software development.

Publications

- Abraham, M. and Khamis, M., Communicating Security & Privacy Information in Virtual Reality., 1st International Workshop on Security for XR and XR for Security., 2021.

Key Skills

My main language is **Python.** I also have experience in:

- C# / C++/ C
- HTML / CSS / CSS Frameworks
- SQL / MySql
- Java / Scala
- Git / BASH
- JS / TypeScript / JS Frameworks
- Flask
- UML / Prototyping
- Unity
- VR / AR Development

Notable Projects

- **Protecting Older Adults Online** – My Honours Project works to improve the resilience of older adults towards cyber-security attacks by developing methods to communicate account security weaknesses and advising on appropriate protections, through novel visualizations. For more detail: (link)
  Awards: Finalist 'Best project that makes a difference'- University of Dundee Computing Awards 2021

Other Computing Related Experience

President of Dundee University Computing Society (DUCS)

I lead a team of students to create social and technical events for the collective Dundee Computing Student body. I have increased membership of this society from 30 to 200+ members and have increased the number of activities that the society organises. My aim has been to create a positive and effective environment within my team, to run events that bring students and members of industry together. Events included skills workshops with speakers from the university along with experts from industry, social events working with local businesses around Dundee, Coding challenges with external tech companies and our own annual Hackathon. My role includes:

- Project Management
- Public Speaking
- Events Coordinating
- Long term planning
- Outreach
- Leadership

Awards: Most Progressive Society- DUSA Annual Awards 2020

Strathmore Trophy Mentor

I guided 16 teams of secondary school pupils to come up with accessible designs for those who struggle with speaking. I advised on accessible design and helped refine the ideas phase to create a realistic product to submit for judging.

Other Work Experience

Royal Air Force (Reserve): Officer Cadet with ESUAS

Sept 2017 – Aug 2020

I am responsible for maintenance and upkeep of communication channels for a squadron of 90 people. I have attended leadership courses which were applied in events planning and exercises to achieve mission goals. This has taught me determination, to think clearly under high pressure situations and contingency planning for when things do not go to plan.