Eleanor **McMurtry**

Candidate, Master's Degree, Applied Cryptography

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Summary

I am a Master of Science (Computer Science) student at the University of Melbourne researching applied cryptography with Vanessa Teague. I have been a programmer for years, and am passionate about education, security, and privacy. Research interests include zero-knowledge proofs, authenticated data structures, and multiparty computation.

Education

University of Melbourne

Parkville VIC 3010

M.Sc. (Computer Science) — *2019-present*

B.Sc. (Mathematical Physics) — *2015-2018*

Diploma in Informatics — *2015-2018*

Experience

University of Melbourne

Research Assistant — *Jul 2019 - Present*

- Working with Prof. Shanika Karunasekera to develop and deploy a large distributed cloud-based system for data collection and analytics. The project allows large volumes of data (e.g. from social media) to be categorised by topic and analysed for patterns.
- Working as a full-stack developer on a Java server and two front-end GUIs in Java and React. Responsibilities include finding and fixing issues, as well as developing new features and system monitoring scripts.
- Assisted the security research group with grant applications.

Blueprint for Free Speech

Developer Liaison — *Jul 2019 - Present*

- Created a revived GitHub presence and website for the Ricochet end-to-end encrypted chat service operating over Tor.
- Helped update the C++ codebase and installation scripts to work with the latest versions of Tor and operating systems.

University of Melbourne

Head Tutor (Object-Oriented Software Development) — *Jul 2016 - Nov 2019*

- Managed the tutoring team for a core subject with hundreds of students, liaising between students, tutors, and lecturers.
- Developed major assignments for students, including specifications, marking criteria, and testing methodology.
- Delivered one to two lectures per semester on software tools and alternative paradigms while also teaching two to three tutorials per week.
- **Excellence in Tutoring Award** (2017), School of Computing and Information Systems

Peter MacCallum Cancer Centre

Summer Student — *Nov 2018 - Feb 2019*

- Worked as a full-stack developer consulting with scientists to build a web application using Python and MySQL, allowing users to work with a database for prostate cancer samples and patients.
- Created interactive search and visualisation tools to collate and present large amounts of data in an easy-to-digest format.

Honors & Awards

2020 **Student Registration Grant,** IEEE Symposium on Security and Privacy — *Oakland, California, U.S.A.*

Publications

- Eleanor McMurtry, Olivier Pereira, Vanessa Teague. **When is a test not a proof?** *In Submission.*

Projects

CUDA CCL (`https://github.com/noneuclideangirl/cuda-upad/`)

University of Melbourne — *2019*

- A tool to perform connected-component labelling on a large image very quickly using a GPU. Written using CUDA and C++, implementing an algorithm from the literature in a way that had not been successfully done before to maximise performance.
- Major project for the graduate subject Parallel & Multicore Computing.

Extra-Dimensional Box (`https://github.com/noneuclideangirl/extra-dimensional-box`)

University of Melbourne — *2019*

- An implementation of the Bitbox protocol by Dr Aaron Harwood, a peer-to-peer file-sharing system.
- A Java networking project designed to be efficient and reliable, for use on small computers such as a Raspberry Pi.
- Major project for the graduate subject Distributed Systems.