ANDREW CALDER

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SUMMARY

I am a 4th year Ethical Hacking student studying at Abertay University, seeking a graduate role in infosec. I am the current president of the Programming society, and an active member of the Ethical Hacking society. Away from keyboard I enjoy photography, skiing and cooking.

SKILLS

SECURITY

Exploit Development: Produced proof-of-concept (open calculator) and advanced (create reverse shell) for CoolPlayer 2.19 with Data Execution Prevention (DEP) on and off. Developed examples of various techniques such as ret2libc, rop chains and egg hunter using tools including (but not limited to) Immunity Debugger, Olly Debugger, Mona, and arwin.

Web Application Testing: Assessed the security of a generated web application '*Rick Astley's Jewellery Store*' following the *Web Application Hackers Handbook* methodology. Used tools such as Burp, Nikto, DirBuster, and techniques including (but not limited to) SQL injection, XSS, cookie and packet inspection, source code analysis, fuzzing, etc.

Network Penetration Testing: Mapped and assessed security of a virtual network: enumerated network devices using tools such as snmp-walk and nmap, wrote a python script to aid subnet calculations, created a network map based on the findings. Produced a report on current security of network, and how to improve it.

Digital Forensics: Investigated the PC of *John Doe* - A suspected serial ornithologist. Cloned *John Doe's* hard drive and performed a full forensic investigation on the cloned image as not to compromise the original. Used tools such as Autopsy, Scalpel, Mandiant Web Historian, MD5deep and John The Ripper.

DEVELOPMENT

C++: Designed a farmer-worker thread manager for use with both brute force and dictionary-based password crackers, which could process md5 passwords at a rate of ~3500/s.

C++/ CUDA: Implemented *Highly Efficient Parallel Failureless Aho-Corasick* - a variant of Aho-Corasick designed for GPGPU. Continuing development as Honours Project.

Java / Android: Developed a MediaPlayerService-based music player for android 8.0 (Oreo) using RecyclerView, GridLayoutManager, Fragments, Picasso, permissions, and media button control. Also implemented stateful playback; reduce/increase volume on notification, and pause/resume music on call. *Link*: *https://www.arcalder.uk/android-app-dev-kanta*

Python: Lead a team of 5; designed and developed '*USB Skeleton Key*' - a modular physical pen-testing framework for the Raspberry Pi Zero W. Built as a cheap alternative to existing tools such as *USB Rubber Ducky* or *BashBunny*, *Skeleton Key* was chosen as the student project demonstration for open day presentations. *Link: https://github.com/AR-Calder/usbskeletonkey*

Full Stack Web Development: Developed a website template featuring; secure login with prepared statements and parameterized queries, session management, dynamic content fetching, and multi device support. The website followed the OWASP DevGuide where applicable and was built with HTML5, PHP, Javascript and MySQL.

EXPERIENCE

VOLUNTARY

Abertay Programming Society President & Co-Founder *April 2018-Present, Abertay University, Dundee, Scotland:* Co-founded society; wrote and agreed upon constitution and objectives with committee.Prepare and present content (workshops/presentations) at weekly meetings to teach members topics not explored within their courses. Held a workshop on git basics that was attended by over 30 people, and held a cross-society event on Ada Lovelace's day focusing on the achievements of women in

computing through a shift-cipher based CTF. *Link: https://github.com/AbertayProgrammers*

Abertay Space Agency Treasurer *September 2017-2018, Abertay University, Dundee, Scotland:* Prepare weekly meetups with members of society, Manage society funds and donations.

WORK EXPERIENCE

MacGregor Industrial Supplies - Warehouse Operative *July - September 2018, Inverness, Scotland:* A full-time temporary summer position, during University holidays. I worked as part of a team of 6-8 people tasked with ensuring incoming goods were as expected.

Maplin Electronics – Sales Advisor *October 2014-June 2015 and June -August 2016, Inverness, Scotland:* Retained a high level of product knowledge, providing an outstanding level of customer support and advice. Made largest sale (August) across all Maplin stores. Operated POS systems, helped maintain a well-stocked & tidy shop, and assisted in warehouse/shop floor reorganisation.

PROJECTS

Hons Project (on-going) An Investigation into GPGPU Optimizations for High Bandwidth Network Intrusion Detection Systems.
Description: A GPGPU signature-based detection engine for NIDSs aiming to provide a significant performance improvement over existing open-source solutions - utilising commodity hardware.

Several other projects can be found on my website (QR code) and github

GENERAL

Public Speaking: Presented student project '*Skeleton Key*' at both 2018 Abertay open days to around 100 people, led multiple workshops for around 30 people during weekly Programming society meetings.

Various Operating Systems: Primarily use Fedora (Linux) -which is similar to RHEL, also comfortable using debian based distros such as Ubuntu and Kali, and have experience with windows 98 through 10.

Other Achievements: Member of team that was awarded 2nd place in Palo Alto EMEA Network Academy Day

EDUCATION

BSc (Hons) Ethical Hacking *September 2015 – Present University of Abertay Dundee, Scotland, United Kingdom*: Expected 1st. GPA A+

Awards and Honours:

- Diploma of Higher Education with Distinction: 2016/2017
- Certificate of Higher Education with Distinction: 2015/2016

Scottish Highers *2013-2015 Millburn Academy, Inverness, Scotland, United Kingdom:* Achieved 7 Highers including Maths and Technological Studies.

Scottish Standard Grades *2009-2013 Millburn Academy, Inverness, Scotland, United Kingdom*: Achieved 8 Standard Grades; 7 Credits and 1 General

REFERENCES

Colin McLean, lecturer - C.McLean@abertay.ac.uk

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