Callum McGregor

# Summary

I am a second year student at Exeter University, reading Computer Science. Most of my academic experience is in Java with exposure to C, C++, Python, Microsoft Visual Basics and Haskell. I also have industrial experience in web design and mobile application development using HTML, CSS and Javascript.

I have used Java extensively as its versatility makes it ideal for University projects as well as being essential in industry. While it does have its rough patches, (example) I find Javascript very enjoyable to use. Using jQuery with HTML and CSS allows me to be creative and have an almost tangible end result, which I find very rewarding.

I spent the summer of 2014 working for Harlequin Computing Solutions, creating a mobile phone application that puts cyclists in touch with each other when they need help with a broken spoke or puncture. We used a technology called Cordova, which allows web applications to be run as a cross-platform mobile application.

# Education

## Exeter University: Reading Computer Science September 2013 – Present

Skills learnt:

Java, JUnit, Java Threading, Java Design Patterns, C, C++, C#, Objective-C, Python, HTML, CSS, Javascript, Ajax, PHP, Functional Programming (Haskell), Logic Programming (Prolog), SQL, Git, Test-Driven Development, Agile Development (Scrum), Pair Programming, UML, Linux, Network Architecture and Protocols.

I studied Computer Science and Mathematics in my first year at Exeter and received a First-Level mark and a Dean’s Commendation for my results. I decided to focus on Computer Science in my second year, as this is where my real passion lies and continued without any Mathematics modules. After covering the basics of Java I started to learn a lot about the development process and programming paradigms, which I found insightful.

We learnt the functional language Haskell and I found this required a huge change in my mindset when approached programming. I am keen to bring this way of thinking into my programming in other languages such as Java. I have also studied areas such as artificial intelligence, system architectures, databases and networking with some practical experience in each area.

I used Raspberry Pi’s to learn about the Linux operating system. I have been appointed the Treasurer for Exeter University Computer Science Society and am also on the committee for the university’s Real Ale Society.

## Alton College September 2011 – June 2013

Skills learnt: Pascal, Windows Visual Basic

It was at Alton College that my interest in computer science was sparked, which I studied along with Mathematics and Further Mathematics. I had not studied Computer Science before but I soon grew a passion for it. I learnt to program using Pascal, which as a strongly typed language with no exception handling or modern IDE and a quirky, novelty to it was a fun start to programming which taught me to have an eye for detail from the start. In my second year we developed a central heating control system written in Microsoft Visual Basic and using a waterfall development process. This approach to software engineering made it difficult to include forgotten system requirements and caused many propagating bugs. This was a nice introduction into how to construct larger systems. I achieved Computer Science, A; Mathematics, A; Further Mathematics, B.

# Skills

## Java

I have experience with using JUnit 4.12 for my studies and in personal side projects. I spent some time working on a Java library with my father which introduced an assertion testing functionality to JUnit. I have experience using Mock Objects and Test Suites for large, multi-class systems that require it. JUnit’s testing framework, along with test-driven development makes for much better code in a process that I find very satisfying.

I wrote an application to run a genetic mutation algorithm in a thread-safe manor as a piece of coursework with a peer. Threads are essential in modern computing so are useful to be able to use effectively but I can now see the benefits of immutable code!

We studied six of the basic Java design patterns, Factory Method, Abstract Factory, Decorator, Builder, Command and Singleton. The problem that design patterns solve is one that I have considered many times before and studying them has given me a good understanding on how we can stand on the shoulders of giants and write code more efficiently.

## Javascript

I have experience writing Javascript for a web application used as a mobile app. Despite it’s strange prototype inheritance model and closures I found Javascript very enjoyable to use. Using jQuery made for a much more fluid writing of code when selecting objects within the DOM.

## Mobile Application & Web Development

I had a large contribution to the development of a mobile phone application called RescYouMe. I researched and chose to use a technology called Cordova, which allowed a web application written in Javascript, HTML and CSS to be run as a cross-platform mobile phone application.

This approach gave me experience of both web and app development. The entire app was written in JavaScript but I had to interact with various technologies on the device such as geo-location services and applications such as the native SMS messaging application. This is where I learnt why Android is a better OS for developers as Apple’s messaging app would not allow a prewritten SMS to be sent and their move to Maps from Google Maps made it very difficult to open the application over a given location.

## Programming Paradigms

I have a lot of experience with different programming practices both in my studies and commercial experience. I have implemented aspects of extreme programming such as pair programming and test-driven development and Scrum agile development. I enjoy practicing extreme programming and have experience working as a pair but also like the structure of a Scrum team. Learning these processes has given me a good insight into how software is produced in industry.

## Other Skills

Other languages and skills that I have experience in and would be happy to discuss are: Python, C, C++, C#, Objective-C, Functional Programming in Haskell, Prolog, Artificial Intelligence, SQL, Network Architecture and Protocols.

# Experience

## Harlequin Computing Solutions June 2014 – September 2014

Skills used:

HTML, CSS, Javascript, jQuery, Git, Java, Extreme Programming, Test-Driven Development, Pair Programming, Cordova, iOS Development, Android Development, use of APIs.

Role overview:

I helped theorize, design and implement a mobile phone application called RescYouMe that puts stranded cyclists in communication with other nearby cyclists. I influenced the course of the project by researching and analysing which technologies would be used. I got a lot of experience in writing the application using HTML, CSS and JavaScript in the form of webpages. In particular, I used native APIs to use a devices map application and geo-location services to find your current position and help others find you. I exercised the Extreme Programming paradigm and got enjoyed using test-driven development and pair programming. We used Git as our version control system and I have since used it for many pieces of coursework and side projects.

Interesting challenges:

# References

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