

## **Personal Statement – Rukmal Fernando**

My earliest memory of a 'real' computing project takes me back to around 1997, when I first took a code sample for encrypting string with the MD5 hashing algorithm, and created a DLL to encrypt and decrypt binary files. I remember how the effort I put in was worth the joy of seeing it work! And so I continued, making mistakes and learning on my own in the process.

Formal education was however through the degree programme of Manchester Metropolitan University, the largest non-federal University of UK, through their collaborative partner, the Informatics Institute of Technology (IIT) in Sri Lanka.

It was my undergraduate project that gave me my first real research experience as such. I started off with the idea that a person's behaviour, as seen across a communications network, was almost always limited to a subset of allowed behaviour and that display of one going beyond a previously known boundary could be taken as a sign of possible impersonation. Much study as well as discussions with my supervisor helped define the research problem and I set out on the study though with some element of doubt about the level of achievement and success.

Looking back, I believe that this was one of the best decisions that I ever took: in spite of the uncertainty (or perhaps, I should say, *because of the uncertainty*) the project exposed me to advanced research conducted at many renowned institutions, and gave me the opportunity to synthesize a novel solution as opposed to merely developing on what is already known and available. To test my hypothesis, I designed and developed a software system which required me to capture, dissect and decode network packets, connect components in different languages together (e.g. WinPCap to VC++, and in turn to .Net), and securely connect components over a network all the while trying to preserve privacy of stored behaviour information. I also proposed a technique for making such anomaly detection more deterministic. The project was inherently not one that could be explained in a sentence or two, and the thesis, the defense, and the later papers and conference presentations all required me to communicate my thoughts and achievement clearly to various audiences from diverse backgrounds. Apart from the obvious technical skills, a number of soft skills also helped me with my project and indeed the whole of my university career.

I presented two conference papers to an audience of academia and industry. My prototype was evaluated by a panel from the British Computer Society - Sri Lanka Chapter, and won the Silver award in a national software competition (NBQSA in 2005).

As I had done during my schooling, I continued to play a leadership role as an undergraduate too. My involvement in organizing our annual projects exhibition is an example, and on several occasions I have led team assignments (of up to 9 members, lasting up to 6 weeks) to the highest marks in the batch. I also coordinate activities and maintain harmony (*even with constraints like finances!*) as the mailing lists moderator of both my university and school classes.

My industry work experience, both during my internship (*13 months*) and my current work (*since October 2005*) have been more research oriented than the typical work (*albeit technological, rather than purely academic*). During internship I worked on Microsoft Sharepoint Portal Server 2003, customizing it heavily and building applications on it even before it was released publicly, when there was virtually no product expertise anywhere in the world.

In my current work, at the R&D Centre of the global ERP company IFS, I am involved with some development tools designed to make it easy to identify and apply code patches and updates across numerous customized codebases, in four different development languages. I was involved in evaluating and selecting the best technologies and tools, and developed part of the base architecture of our new application, using ANTLR and C# 2.0. A recent milestone, after more than 4 months of work and many scrapped prototypes, was a context sensitive parsing solution using ANTLR.

My work so far, liaising with internal clients in US (*during internship at Virtusa*) and senior designers in Sweden (*now at IFS*) required collaborative team work and taking initiative for technological decision-making.

I would also never regret my decision to become a part-time faculty member of IIT, and I have now realized how much I truly enjoy teaching. I try to imbue my students with proper understanding of concepts and the ability to synthesize, versus knowledge *per se*, and the student feedback to IIT has been very positive. I co-lectured for a final year Database module, and am currently responsible for a Programming module in a sophomore class, and a Database module for a freshman class.

Looking towards the future, I see three areas in which I believe I have much more to achieve, and in turn contribute to our society. First and foremost, as a researcher, I want to have more of the joy of discovering something new and putting it before the world, as I managed to do through my undergraduate project. Secondly, I want to continue teaching undergraduates, to help mould and shape the next generation of professionals and academics. Thirdly, I want to become a thought leader in the application of technology. Although sadly *cliché*, I really do dream of creating my own company – one that provides future-proof technological solutions and achieves client delight, and equally importantly, provides an engaging and challenging work environment for software professionals. Even if I do not start my own in the near future, I still want to be at the helm of making the right kind of technology work for society at large.

This is what drives me to look for advancing my academic career by way of a Masters degree. I honestly am not decided right now whether I want to proceed after that to a Doctoral degree, or whether I want to switch over to a business oriented academic program. I do, however, know very well that my immediate goal is to get a firm theoretical grounding and a good research experience and further develop my critical thinking and research skills to be able to provide true technological leadership.

I assess the University's Master's programme in Computer Science as offering what I seek: a chance for further study in areas that I find particularly interesting, exposure to areas like Software Engineering which is relevant to what I hope to do on my return to Sri Lanka, and a university experience that will no doubt help me to become stronger as a professional, academic and researcher.

In short, I see myself, first and foremost as academically oriented with a solid educational grounding and a deep understanding of computing with my formal and non-formal computing backgrounds, and specially my 2 ½ years' work experience. Secondly, I feel that my teaching, research publications and awards are testament to the relative maturity of thinking, research skills and technological expertise that I possess. Thirdly, I see my consistently high academic performance as an indicator that I am truly capable of undertaking postgraduate study and that I can make a valuable contribution to the world of knowledge from it. Lastly I see myself as a person, and a human being, who has a lot of potential for benefiting from study at a prestigious institution, and with the staff and students I expect to meet, to make lasting friendships, prosperous partnerships and to promote mutual growth.