Statement of Purpose

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I want to pursue a Postgraduate Doctoral Degree (PhD) in Computer Science, and my career aspiration is to work in the Software Industry as a Research and Development Scientist. My research interests include distributed computing and software engineering.

My motivation for pursuing research related to distributed computing stems from my experience as a software engineer which comes with the need to deliver reliable, scalable and maintainable software applications. To meet these requirements, one must consider the whole architecture of delivering enterprise application services from user specification analysis to coding to maintenance. It then becomes necessary software engineering design patterns, software architectural styles, cluster and grid computing technology and developing tools and libraries that will make the development, deployment and maintenance of these applications simple.

Gone are the days when software development was only a matter of putting together code that will run. Nowadays, software developers have to take into consideration the constant shift in user requirements, the need for continuous delivery of application updates, whiles staying withing limitations and meeting organisational goals and objectives. Applications must be built to fail (fault tolerant), be able to scale to meet the dynamic nature of clients requests, provide health and monitoring reports and be available always.

> *Any organisation that designs a system will produce a design whose structure is a copy of the organisation's communication structure. - Melvyn Conway, 1967.*

I aspire to conduct an intensive research on cluster and grid computing technologies, especially as applied to peer-to-peer (P2P) computing. Whiles cluster and grid computing technologies are still young; cluster computing refers to combining the powers of two or more commodity-off-the-shelf hardware components so they can offer the power required by computational and data intensive application, and grid computing's basic aim is to utilise an enterprise's entire computational resources (servers, networks, storage, sensors, scientific instruments and information) in different geographical locations, acting together to create one or more large pools of computing power.

The future here. Extensive research is required to be able to reach these goals. There needs to be systems to manage, monitor and provide a single view of the various distributed resources. Condor (for cluster computing) and Globus (for grid computing) are providing currently the most popular platforms for using these technologies. It is my aim to contribute to the Condor and Globus open source projects through research, feature proposal, bug fixes and active code development. The Condor Project is written in C++ and the Globus Project in C.

Furthermore, I wish to conduct research into software engineering. This interest comes from the need to build software in a way that is easy to be maintained by an organisation. I intend to identify software architectural styles that could leverage the distributed nature of hard systems. Such a poular style is called the Microservices Architectural Style. I have employed the microservuces archuitectural style in a number of projects. Microservices allows development of applications as a set of small independent services. Service can communicate through a popular and often a lightweight mechanism.

Consequently, one can easily

Nevertheless, the proposed microservices approach has got its own set of challenges to overcome.

Although I am open to a variety of research, research supervisors at Baylor's School of Engineering and Computer Science whose projects are especially appealing to me are Dr. Tomas Cerny, Dr. Bill Poucher and Dr. Eunjee Song. Looking at various research publications made by various supervisors, Dr. Tomas Cerny research most aligns with my areas of interest.

Finally, Baylor University is known for its diverse culture of Christian commitment and rigourous academic and research programs. These have given me a sense that Baylor’s PhD program is a great match for my interests.