Keynote I

Building Synthetic Universes in the “Cloud”: The Theoretical Astrophysical Observatory (TAO)

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Abstract
In this talk I will discuss the use of new technologies to build and deliver cosmological-scale galaxy formation simulations to the astronomy community. Combining high performance computing, a “web 2.0” front-end architecture, and cloud-based processing and storage, the NeCTAR funded "Theoretical Astrophysical Observatory" (TAO) will allow astronomers construct their own virtual Universe from a range of different dark matter simulations and galaxy evolution models, "observe" the output through virtual telescopes, and download the results for their own scientific use. TAO will be of value to both large survey teams and individuals, and will serve a wide range of scientific needs.

Speaker's Bio
Dr. Croton is an Associate Professor and QEII Research Fellow in the Centre for Astrophysics and Supercomputing at Swinburne University in Melbourne, Australia. He primarily works on theoretical aspects of the formation and evolution of galaxies in the nearby and distant Universe, using both supercomputer simulations and large observational data sets. A recent focus has been the “big data” challenges facing astronomy, brought about by the ever increasing sensitivity and size of the telescopes and supercomputers astronomers routinely use.
Abstract

Operations costs are around 50% of the worldwide costs of Information Technology. Yet operations problems are mainly viewed as the problem of IT and not the problem of software engineers. This is a short sighted view. I will discuss some areas where software engineers could be of great assistance to operations. Some areas where software engineering expertise could be brought to bear are: Upgrades from version N to version N+1 are a common occurrence. Some systems are updated as frequently as 10 times a day. Approximately 10% of these updates fail. Configuration errors are another common occurrence. Some of these errors are quite subtle and extremely difficult to detect. Operations processes dictate particular steps when managing applications. Some modeling techniques are suitable for simultaneously modeling the process and the product. A model that has elements of process and product can be used to gather requirements for products to provide information useful for operations processes. It could also be used to identify opportunities for automation within operations processes. In general, my argument is that operations personnel are important stakeholders for systems. Software engineers could make a significant contribution to smoother operations activities and operations processes provide an important source of problems for software engineers.

Speaker's Bio

Len Bass is a Senior Principal Researcher at National ICT Australia Ltd. (NICTA). He joined NICTA in 2011 after 25 years at the Software Engineering Institute (SEI) at Carnegie Mellon University. He is the co-author of two award-winning books in software architecture, including Software Architecture in Practice, 3rd edition and Documenting Software Architectures: Views and Beyond, 2nd edition as well as several other books and numerous papers in computer science and software engineering on a wide range of topics. Len has almost 50 years experience in software development and research in multiple domains, such as scientific analysis systems, embedded systems, and information systems.
Keynote III

Tech Transfer in the Trenches

Carrie E. Gates
Distinguished Engineer
Senior Vice-President and Director of research
CA Technologies

Abstract
Why is it that so many good results from academia and research find it so difficult to be incorporated into products or become adopted by industry? What are the barriers to industry adoption, and how can researchers work effectively with industry? While some companies are better than others at bridging the divide between research and development, the corporate culture is continually evolving, and tech transfer methods must also continually adapt to remain effective. This presentation will describe the lessons I have learned to work effectively within the culture of a large corporate development lab in order to enable research results to be integrated into products.

Speaker's Bio
Dr. Carrie Gates is a Distinguished Engineer, senior vice president and director of research with CA Labs, the research arm within CA Technologies. She is responsible for performing research that has the potential to impact the strategic direction of CA Technologies products and services. This is achieved through identifying opportunities within the business units at the company that can be transformed into research relationships performed in collaboration with university faculty and students, with a focus on research in the area of enterprise-level security.

Dr. Gates has given over 20 invited talks internationally, authored more than 40 peer-reviewed publications related to information security and co-authored an amendment on cloud security research for the America Competes Act that was signed into law in December 2010. In October 2010, she was recognized for her work with a Women of Influence award from CSO magazine.