WESTERN SYDNEY UNIVERSITY

School of Computer, Data and Mathematical Sciences

HDR Seminar 8
Program
28 April 2021

Time	
4:00pm - 4:10pm	**Briefing** **Topic: Policy update and announcements** A/Prof Dongmo Zhang
4:10pm - 4:40pm	**Invited speech** **Topic: SLA Management in Intent-Driven Service Management Systems: State of the Art** **Speaker:** Yogesh Sharma, Magic lab, Concordia University, Montreal, Canada
4:40pm - 5:00pm	**Conference presentation** **Topic:** *2021 IEEE VR Conference Sharing* **Speaker:** Jolin Qu (PhD Candidate - 18885806) **Supervisory panel:** Dr Quang Vinh Nguyen and Prof Simeon Simoff
5:00pm - 5:20pm	**Candidature Research Presentation** **Topic:** *How 3D Game Engines Empower the Interaction and Scalability Factors to Visualise Complex Genomic Datasets?* **Speaker:** Nader Khalifa (PhD Candidate 17599678) **Supervisory panel:** Dr Quang Vinh Nguyen, Prof Simeon Simoff and A/Prof Daniel Catchpoole
5:20pm	**Closing**

Venue: KW.Z.G.64 and Online via Zoom
Zoom ID: 886 7872 4041

Next HDR Seminar: 26 May 2021

SLA Management in Intent-Driven Service Management Systems: State of the Art
Speaker: Yogesh Sharma

Abstract: The sustained and rapid increase in data traffic imposes a significant demand on traditional network infrastructure. Such demand compels the communication service providers to expand and modernize their infrastructure by adopting elastic and scalable solutions characterizing clouds. However, the management of cloud deployment hosting telco-grade applications is a cumbersome process. Without employing intents, closed-loop automation and machine learning, it is impossible for human beings to comprehend operational and management complexity. Intent-driven computing system (IDS) enables the users to submit their high-level operational goals and expected outcomes (intents) as input without specifying how they should be achieved. IDS adapt their behavior to respond to user intents and configure, monitor, heal and optimize themselves to increase the quality of experience of the service for the end-users with little or no human supervision. Such complex systems require rigorous monitoring and efficient service orchestration and performance optimization methods to meet the performance expectation and service level agreements (SLAs) corresponding to each intent. In order to do so, a deep understanding of the lifecycle of an intent and service and resource monitoring and management methods required to manage the intent during its lifecycle is mandatory and has been explored in this study.

Biography: Yogesh Sharma had finished his PhD from School of Computing, Engineering and Mathematics at Western Sydney University in August 2018. Presently, he is working as a post-doctoral research fellow with Magic lab, Concordia University, Montreal, Canada. Before his current appointment, he worked as a post-doctoral fellow with Karlstad University, Sweden and research associate with CLOUDS lab, The University of Melbourne. His research interests are Intent-driven service management systems, cloud computing, network function virtualisation (NFV) and software defined networks (SDN).

2021 IEEE VR Conference Sharing

Speaker: Jolin Qu

Abstract: Are you ready for virtually anything? IEEE VR 2021 conference used a virtual campus app brings people together to work, chat, learn, meeting, network and train in an immersive world from everywhere. VR technologies are useful and connect people together. VR research focus on: space and body perception, computer graphics, body language, motor control such as human and robots, etc. VR is a good tool for scientists to study human experience. Human body is special and should be carefully considered when designing immersive technology and self-avatar is valuable as a ruler/reference for interactions with environment. The ending reality needs to combine intelligent virtual agents, mixed reality and internet of robotics things to blend reality spaces. VR also brings us some privacy challenges with its tracking eyes, hands, face and heart features. I will share with you the IEEE VR 2021 virtual experience, the amazing parts, VR research trends and directions, and some personal thoughts about attending a conference.

How 3D Game Engines Empower the Interaction and Scalability Factors to Visualise Complex Genomic Datasets?
Speaker: Nader Khalifa

Abstract: In cancer biology, genomics represents a big data problem that requires accurate visual data processing and analytics. The human genome is a very complex gene containing the information for all individual patients and the biological mechanisms of their disease. Therefore, when building a framework for personalised treatment, the complexity of the genome must be captured in meaningful and actionable ways. we proposed framework consists of multiple components enabling the complete analytics for supporting personalised medicines, including similarity space construction, automated analysis, visualisation, gene-to-gene comparison and user-centric interaction and exploration based on feature selection. We utilised 3D game engine platform for developing a smooth and interactive visual presentation of the information. We illustrate the effectiveness of our approach through case studies with datasets from childhood leukemia cancers.

Technically, the project aims to utilise Unity3D, to provide a smooth and interactive visual presentation of information, cross platforms as well as screen sizes and resolutions. By utilising the capability of the game engines in terms of processing efficiency, fast model rendering and smooth interaction with the objects. Lastly, with the advent of gamification in science education, (elements of) the visualisation gear developed in this project can be incorporated on-demand for the course material in respective academic programs.

Extension from the above work using a dataset from Westmead Children Hospital, the study evaluates the interaction of 3D game engine comparing with three tools were built using the same dataset, two application was made by "Unity 3D" and one app was built by Java graphic library-based. we use the 3D game engine to provide interactive visualization to support interactive data analytics/visualization, and its effectiveness is shown via the usability study. The usability study outcome aims to identify the level of interaction and scalability factors how would be accepted based on the user experience and their preference to enhance cognitive engagement with the complex medical dataset. The participants involved with different data visualization tools installed on one Tablet, and two on Pcs, then provided their feedback accordingly. The quantitative usability study carried out virtually, with remote support. There were no physical contacts involved in this study due to COVID19 policies.