

Northumbria University/Sunderland City Council Seminar on Advanced Technology for Health and Care Services

13th March 14:00 – 16:00, Civic Centre, Sunderland, Committee Room 6

Programme

14:00 – 14:30	Dr. Hubert Shum – Harnessing the Power of 3D Technologies for Health and Care Services
14:30 – 14:50	Dr. Edmond Ho – Analyzing Motion and Emotion using Vision-based and Machine Learning Technique
14:50 – 15:10	Dr. Kamlesh Mistry – Intelligent Facial Expression and Object Detection Systems for Real-world Applications
15:10 – 15:30	Dr. Alan Godfrey – Wearable Technology as Low-cost Diagnostics in Modern Medicine
15:30 – 16:00	Interactive Demonstration and Discussions

Speakers Information



Dr. Hubert Shum is an Associate Professor (Reader) in Computer Science at Northumbria University, as well as the Director of Research and Innovation of the Computer and Information Sciences Department. He leads the Computational Intelligence and Visual Computing Research Team, which consists of 11 faculty members, 2 post-doctoral researchers and 22 PhDs. He has received £124,000 from the research council EPSRC, £24,000 from Royal Society, and more than £365,000 from Northumbria University for different research projects. He has published more than 80 referred papers and has organized multiple international conferences. He has collaborated with industrial partners especially from the healthcare sector, such as Royal Victoria Infirmary, City Hospitals Sunderland, NHS Innovation North and Sunderland City Council. More information can be found at <http://info.hubertshum.com>

Dr. Shum will talk about how 3D technologies can be used to assist in health and care services, such that service quality can be improved with reduced cost. He will discuss the latest break-through of affordable depth cameras that see not only color but also 3D surfaces. These cameras have the potential to perform accurate 3D measurements, record and visualize users' 3D appearances, analyses and monitor users' behaviour.



Dr. Edmond Ho received the B.Sc. degree in Computer Science from the Hong Kong Baptist University, in 2003, the M.Phil. degree in Computer Science from the University of Edinburgh, Scotland, in 2006 and the Ph.D. degree in Informatics from the University of Edinburgh, Scotland, in 2011. He is currently a Senior Lecturer with the Department of Computer and Information Sciences, Northumbria University, Newcastle upon Tyne, United Kingdom. Prior to joining Northumbria University, he was a Research Assistant Professor with the Department of Computer Science, Hong Kong Baptist University in 2011-2016. His current research interests include computer graphics and animation, computer vision, machine learning, and robotics.

In this talk, Dr. Ho will give an overview of the research projects developed by his team over the last few years. In particular, he has been focusing on using machine learning techniques for understanding human behaviour. He focused on acquiring 3D motion and facial data using vision-based techniques for analysing the understand the action and

emotion state of the subject being captured. The methods can be applied to a wide range of applications such as healthcare and monitoring and smart home applications.



Dr. Kamlesh Mistry completed his PhD in facial expression recognition for humanoid robots from Northumbria University in 2016. Currently, he is working as a Lecturer in computer science at Northumbria University. His main research area is facial expression recognition using computer vision and machine learning techniques. He is also looking for industry collaborations in order to apply his research on real-world applications. All of his research work is published in top ranking journals and conference (<https://scholar.google.co.uk/citations?user=42pN-FIAAAAJ&hl=en>).

Dr. Mistry will talk about facial Expression recognition, which plays an important role in pattern recognition, computer vision, and human-computer interaction, and is widely used in personalised healthcare, video games, surveillance systems, humanoid service robots, and multimedia. Facial expression is one of the effective channels to convey emotions and feelings. Research shows that facial expression contributed to about 55% effect of overall emotion expression during social interactions.



Dr. Alan Godfrey is a senior research fellow with an interest in biomedical and health informatics including the use of wearable technology/systems in a range of older adult health and sport performance applications. He has published extensively on the use of inertial sensor-based wearables to measure gait and its numerous characteristics both within clinical and free-living environments. He has also published methodologies to instrument traditional physical functioning tests and algorithms for falls and physical activity. This encapsulates his efforts to develop robust digital endpoints in clinical-based studies. His engineering and algorithm developments with wearables have been used on many large UK and EU projects.

Solutions are needed to satisfy care demands of older adults to live independently. Wearable technology (wearables) is one approach that offers a viable means for ubiquitous, sustainable and scalable monitoring of the health of older adults in habitual free-living environments. Yet, wearables remain poorly understood and technology innovation often exceeds pragmatic clinical demand and use. In this presentation, Dr. Godfrey provides an overview of how wearables are currently used for real-world clinical-based outcomes, providing insight to ongoing work to streamline wearables for modern medicine.