Speaker 1:

Professor Frank Wang

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Title: Future Computing & Minds

Abstract: Neuromorphic Computing was inspired by the 1981 Nobel Prize work by David H. Hubel & Torsten Wiesel, who found a cascading model in the human brain. Quantum qubits exhibit magnetism-electricity interaction that is similar to that of a memristor. We are building a brain-like computer based on ideal memristors. Most of previous efforts to build brain-like machines have failed because it took about the same silicon area to emulate a CMOS synapse as that needed to emulate a neuron. In theory, any realistic implementation of a synapse should ideally be at least four orders of magnitude smaller than that required to build a neuron. The invention of the memristor opens a new way to implement synapses. A memristor is a simple 2-terminal element, which means a vast number of memristors could be integrated together with other CMOS elements, in a brain-like machine.

Biography: Frank Z. Wang is the Professor in Future Computing and Head of School of Computing (2010-2016), University of Kent, the UK. The School of Computing was formally opened by Her Majesty the Queen. His led school achieved an amazing result in the 2014 UK government REF (Research Excellence Framework): the research intensity was ranked 12th out of over 150 computing departments in the UK. Professor Wang's research interests include brain-like computer, memristor theory and applications, deep learning, cloud computing, big data, and green computing, etc. He has been invited to deliver keynote speeches and invited talks to report his research worldwide, for example at Princeton University, Carnegie Mellon University, CERN, Hong Kong University of Sci. & Tech., Tsinghua University (Taiwan), Jawaharlal Nehru University, Sydney University of Technology, and University of Johannesburg. In 2004, he was appointed as Chair & Professor, Director of Centre for Grid Computing at CCHPCF (Cambridge-Cranfield High Performance Computing Facility). CCHPCF is a collaborative research facility in the Universities of Cambridge and Cranfield (with an investment size of £40 million). Prof Wang and his team have won an ACM/IEEE Super Computing finalist award. He is a panel member for the UK government EPSRC "e-Science" programme and "Hardware for Efficient Computing" programmes. Prof Wang is Chairman (UK & Republic of Ireland Chapter) of the IEEE Computer Society and Fellow of British Computer Society.