

Nano-Net 2009, Lucerne, Switzerland

Tutorial on Brain Inspired Interconnects for Nano Electronics

Speaker's Biography



PETER M. KELLY obtained a BSc (Hons) in Electronics from Brighton University in 1974, a Masters degree in Electronics from the Queens University of Belfast in 1975 and subsequently PhD in electronics circuits using Quantum Device Technology from the University of Ulster. He is a Chartered Engineer, and a Member of the Institute of Electrical Engineers. Dr. Kelly is the book review editor of the *Artificial Intelligence Review Journal*. Dr. Kelly's first research interests began at the New University of Ulster where he developed a monochromatic phonon spectrometer using Josephson Tunneling Junctions. He later joined Sony Corporation's broadcast and consumer electronics groups where he researched and developed the Sony Interactive Knowledge System. He joined the Intelligent Systems Engineering Laboratory (ISEL) based in University of Ulster in 1997 where his research interests turned to high-speed switching circuits and architectures, based on quantum devices, as a means of realising re-programmable arrays and other hardware frameworks suited to the implementation of brain inspired processing techniques such as reconfigurable computing, neural networks and evolvable hardware. He is now a member of the *Intelligent Systems Research Centre* which is a centre of excellence at the Magee campus of the University of Ulster. He acted as PI for University of Ulster in a successful Euro 1,000,000 collaborative research project "*Quantum Device Technology on Silicon*" (QUDOS) EU project IST 2001-32358. In this project he collaborated with the Cavendish Laboratories (Cambridge, UK) and the Max Planck Institute (Stuttgart, Germany). He has also completed a Euro 360,000 research project "*INTERconnections by electromagnetic WAVE propagation in silicon-based artificial spiking neural networks*" (*INTERWAVE*) in collaboration with the Tyndall National Institute (Cork, Ireland). Currently he is a grant holder in an £800,000 EPSRC funded project "*Biologically Inspired Architecture for Spiking Neural Networks in Hardware.*" This project seeks to investigate and design architectures for nano-scale artificial synaptic and neuronal devices. Dr. Kelly holds a joint patent for two devices which electronically mimic the synaptic activity in the brain. These devices form the basis of the research for his most recent project.