

## Biographical sketch

Stephen Weddell

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Stephen Weddell received his B.App.Sc. and M.App.Sc. degrees in Electrical & Computer Engineering from Curtin University in Perth Western Australia in 1990 and 1997, respectively, and the Ph.D. in Electrical & Electronic Engineering from the University of Canterbury in Christchurch New Zealand in 2010. He has lectured in the Department of Electrical & Computer Engineering since 2001, became Senior Lecturer in 2013, and is currently the Director of Computer Engineering Undergraduate Studies at the University of Canterbury, New Zealand.

Central to Dr. Weddell's research is digital signal processing and signal conditioning. Key application areas include neuroengineering, where EEG signals are used to detect precursory cues in the brain for classification of specific transient events, and optical wavefront acquisition to classify turbulence aberrations for astronomical image restoration. Specific research interests include signal recovery and time-series analysis, single and multiple time-step prediction, pattern recognition and classification with machine learning, and the design of optical wave-front sensors. General interests, some of which relate directly to his teaching responsibilities, include high performance computing architectures for real-time processing, evolutionary computing, and stochastic structures to support parallel algorithms implemented in both field programmable gate arrays and general purpose graphical processing units.

Since 2006 Dr. Weddell has worked with recurrent networks, specifically, reservoir computing (RC), and designed and engineered RC structures that have the potential for multiple time-step prediction of signals. These are used in diverse applications that include the estimation of Zernike aberrations for astronomical image correction, and to provide multiple time-step prediction for the onset of drowsiness and microsleeps.

Dr. Weddell is a Senior Member of IEEE and regular reviewer to several international journals, including IEEE Transactions on Neural Networks and Learning Systems, Optical Engineering (SPIE) and the Optical Society of America (OSA), and he regularly participates in several key local and international conferences.