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CARES Seminar Series:

Sensitivity, robustness, and modulation of neuronal behaviors: a feedback story

Prof Rodolphe Sepulchre, University of Cambridge

Friday 29th January 2016, 2pm—3pm

CREATE Seminar Room, Level 2, CREATE Tower

Please register at <http://whoozin.com/6AU-JHK-DDD9>

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Abstract:

Reliable neuron activity is ensured by a tight regulation of ion channel expression. Understanding the causal mechanisms that relate this regulation to physiological and pathological neuronal activity is a necessary step for developing efficient therapies for neurological diseases associated with abnormal nervous system activity. We will discuss a novel methodological framework to quantify the sensitivity of neuronal activity to changes in ion channel densities, either from a detailed conductance-based model or from voltage-clamped experimental data. We will illustrate the generality of the framework and its potential to improve our understanding of the regulation of brain functions and to help in the design of new pharmacological treatments.

Biography:

Rodolphe Sepulchre is Professor of Engineering at Cambridge University and a fellow of Sidney Sussex College. His research interests are in nonlinear dynamics, control and optimization. He is currently Editor-in-Chief of Systems and Control Letters and has been an Associate Editor for SIAM Journal of Control and Optimization, the Journal of Nonlinear Science, and Mathematics for Control, Signals, and Systems. In 2008, he was awarded the IEEE Control Systems Society Antonio Ruberti Young Researcher Prize. He is an IEEE fellow and an IEEE CSS distinguished lecturer since 2010 and a SIAM fellow since 2015. His current research interests are in nonlinear control and optimization, distributed control and synchronization, and the analysis of neuronal behaviors.

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