Applied Mathematics Seminar

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Andrew Flynn

School of Mathematical Sciences, University College Cork

Advancements in Machine Learning often arise from a two-way street of neuroscientific observation and mathematical representation

It has been observed that certain neural networks in the brain of humans and other living creatures are capable of performing multiple tasks. To elaborate, it is sometimes the case that while neurons may remain connected in an identical structure, their subsequent dynamics differ on the demand of performing a given duty. Such networks are said to be 'multifunctional'.

Mathematical abstractions of biological neural networks, more commonly known as, Artificial Neural Networks, have in recent years seen a surge in interest. An Echo-State Network is one particular design which can be represented as a dynamical system incorporating the fundamentals of a Reservoir Computer, a 'reservoir' of randomly connected neurons which exhibit certain characteristics.

This talk will focus on encapsulating the phenomenological feature of multifunctionality in a Reservoir Computer. We explore the critical effects that certain parameters can have on the networks capacity to perform tasks of a multifunctional nature and discover, in this parameter-space, bifurcations that may allude to peculiar behaviour of the network.

Thursday, 16.01.2020 · 12:00 · WGB G02

University College Cork · Western Road · Cork · T12 XF62