Deep Learning for Dynamical Behavior Analysis of Excitable Cells

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Joint work with R. Barrio, Á. Lozano, A. Mayora-Cebollero (Universidad de Zaragoza, Spain), F.H. Fenton (Georgia Institute of Technology, USA)

The study of the behavior of a dynamical system is typically carried out using classical techniques, such as Lyapunov exponents. Recently, Deep Learning has been used to perform parametric analyses of well-known dynamical systems [1], and to approximate the full Lyapunov exponents spectrum using only single-variable time series [2]. With Deep Learning, surprising results are obtained, and computational time is considerably reduced. Furthermore, when dealing with real data, classical techniques may not always be applicable, and alternative tools, such as Deep Learning, can be useful [3]. In this presentation, we propose to apply Deep Learning to analyze the dynamical behavior of excitable cells as neurons and cardiomyocytes.
This is joint work with Roberto Barrio, Álvaro Lozano, Ana Mayora-Cebollero (Universidad de Zaragoza, Spain), and Flavio H. Fenton (Georgia Institute of Technology, USA).

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