

NITheCS COLLOQUIUM: Should we do applied Complex Systems Dynamics in primary school?

Prof Fabio Dercole (Politecnico di Milano, Italy)

Monday, 11 September 2023 | 16h00 – 17h00 SAST

Venue: in person* and online

* *Neelsie Cinema, Stellenbosch University*

--- Cheese and wine will be served at the venue ---

ABSTRACT

We applied mathematicians use mathematics to describe everything, from engineering (mechanical, electrical, electronic, telecommunication, aerospace, and civil systems) to computer science, from biology (molecular biology, genetics, ecology and evolution) to social and economic sciences, and even love affairs! But did someone teach us how to apply mathematics?

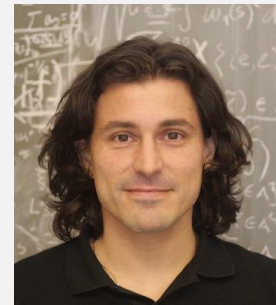
For many school years starting from primary school, several teachers just taught us mathematics, essentially as a collection of theoretical 'games' and tricks to solve them. Whether we liked them or not, we were not shown what we really could do with mathematics, up to second year at a STEM college. Unless we like to remain the elite of those who enjoyed games-and-tricks and stayed strong up to college, we need to turn upside down the way we teach mathematics. We need to start with real applications and practical labs to capture the attention of the majority of students. In this talk, I present an experimental game to do applied Complex Systems Dynamics in primary school with the three simplest operations (+, -, *) on positive integer numbers.

BIOGRAPHY

Fabio Dercole is Associate Professor (habilitation to full since 2018) of Systems and Control Theory at the Department of Electronics, Information, and Bioengineering of Politecnico di Milano, Italy. He received his BSc and PhD degrees in Information Technology from Politecnico di Milano in 1999 and 2003 respectively.

His research interests are within the broad area of complex systems, with particular focus on nonlinear dynamics, networks of interconnected systems, agent-based systems and, more recently, on projects of Citizen Science. He is the author of several scientific papers and has been a visiting scientist in several institutes.

He was awarded the 2003 Chorafas Prize for his PhD dissertation on evolutionary dynamics, and the 2008 Ricercatissimi Prize for his book *Analysis of Evolutionary Processes*. From 2010 to 2015, Fabio has been PI of a 5-year research grant with the project 'Modeling and Analysis of Innovation and Competition Processes'. In 2021 he was elected President of the Italian Society for Chaos and Complexity.



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