Computer Engineering Sans Frontières: Molecular Tweeting, Bacteria Socializing, and Long Road to Precise Medicine (all at once…)

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Abstract:

During high school, I was fascinated by science. I used to read stories about Nobel Prize laureates and dream about their discoveries. Despite this, I became an engineer and, over the years, got to appreciate the power and transformative nature of computing in all human endeavors.

In recent years, due to the network science revolution, I have found renewed interest and (somehow unexpected) opportunities to revisit some topics in science only to realize that they can actually offer a much deeper understanding of systems modeling and optimization. Truth being told, engineering either biological or social systems feels more like an art rather than science but, in order to harness their huge potential, we need to reach beyond the established confines of computer science and (re)define a new science of systems design.

Starting from these overarching ideas, I will discuss the theoretical foundations and practical implications of using a network approach to developing new mathematical models and tools needed to understand and engineer social and biological systems. In other words, this talk is precisely about the subtle interplay between science and engineering and the joy of seeing things come full circle.

Bio:

Radu Marculescu is a Professor in the Dept. of Electrical and Computer Engineering at Carnegie Mellon University, USA. His research focuses on modeling and optimization of embedded systems, cyber-physical systems, social and biological systems.

He received his Ph.D. in Electrical Engineering from the University of Southern California in 1998.

He has received several best paper awards in the area of design automation and embedded systems design. He has been involved in organizing several international symposia, conferences, workshops, as well as guest editor of special issues in archival journals and magazines. He is also a Fellow of IEEE.