



Emerging Topics in Biological Networks and Systems Biology

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JESPER TEGNÉR, King Abdullah University of Sciences and Technology, Saudi Arabia, and Karolinska Institutet, Sweden
On Causality in Networks

Abstract:

It remains fundamentally unclear how to reprogram complex evolving systems. I will talk about a new conceptual framework and an interventional calculus based upon universal principles drawn from the theory of computability and algorithmic complexity to steer and manipulate systems based on their intrinsic randomness. The connection between algorithmic randomness and causality induces a graph-perturbation spectrum ranking the network elements by their steering capabilities. The interventional calculus may be broadly applicable for predictive causal inference and driving model-based approaches to decipher causality in complex data.

About:

Professor in Bioscience and a professor Computer Science at King Abdullah University of Sciences and Technology & Adjunct Chaired Strategic Professor of Computational Medicine, Center for Molecular Medicine at Karolinska Institutet & faculty at Science for Life Laboratory. He obtained the rank of chaired full professor in computational biology 4.5 years after his PhD. He is an ERC co-investigator (consolidator) on causal discovery and is ranked as outstanding (highest distinction) at Karolinska Institutet. He is the founder of two BioIT companies, inventor of several patents., and has served as a consultant for startups. Approximately 200 publications, winner of the international DREAM competition (2008) on network inference, and in 2005 he became the winner of national award for founding the most promising company of the year.

Prof Tegnér holds three separate undergraduate degrees (Medical School, Läkärinjen, KI, MSc Mathematics, MSc Philosophy), 2 years full-time PhD courses in pure and applied mathematics, three international summer schools (Mathematical Sciences Research Institute, Berkeley, California; Methods in Computational Neuroscience, Woods Hole; Non-linear Dynamics in Physiology and Medicine, Montreal, McGill, Canada) PhD/MD September 1997 Medicine, Karolinska Institutet.