



UNIVERSITÀ DELLA CALABRIA

DIPARTIMENTO DI MATEMATICA
E INFORMATICA

DeMaCS

Bayesian (Causal) networks for Healthcare, Medicine and Biology

11 May 2023, 03:00 pm - Aula MT11 (cubo 30B, second floor)

Abstract

Health care and medicine were one of the first areas where artificial intelligence was applied, although initially with little impact on health care itself. Most of the impact of early AI in Medicine (AIME) research was in terms of the development of new AI methods. With the increasing availability of health-care data, there is now renewed interest in AIME, however, this time with the promise of having impact on healthcare. In this lecture we introduce Bayesian (causal) networks and show how they are used to address and solve different problems in healthcare and medicine. The lecture starts by giving basic definitions and introducing a paradox warning us about what, at the current state of the art, can be achieved and can not be achieved when only data are available. In particular, the ladder of causation of Pearl is described and explained. Then, we move to Bayesian (causal) networks by providing definitions and properties about such a type of model. The lecture closes by showing several instances where Bayesian (causal) networks have been developed and used to assist clinicians in making complex decisions, we also describe some running and challenging projects including myasthenia gravis, endometrial cancer, cardiovascular disease and chronic kidney disease.

Speaker

Fabio Stella graduated in Computer Science and received a PhD in Computational Mathematics and Operations Research in 1995, at the University of Milan, Italy. He is associate professor of the University of Milano-Bicocca, Department of Informatics, Systems and Communication, where he leads the model and algorithms for data and text mining (MADLAB) research lab. His main research interests are related to Bayesian networks and causal models for finance, health and biology. He published more than 100 papers, and served as Program Chair/Reviewer of the following international conferences; AISTATS, ICLR, ICML, IJCAI, PGM, NeurIPS, PAKDD, RecSys, SIGIR, ECAI, and UAI. He has been awarded as 10% best reviewers at NeurIPS in 2020 and 2022, and at ICML and AISTATS in 2022. He is Associate Editor of IEEE Intelligent Systems from 2021. He has been Principal Investigator of several research projects and currently of the MG-PerMed project and the CFI project both funded by the European Commission. He served as Advisor of many PhD candidates both in Italy and abroad. Currently he advises seven PhD candidates in Computer Science and Translational Medicine with positions funded by the European Commission, by Fresenius Medical Care, by Roche, and by the National Institute of Tumors of Milan. He served as member of the Panel of Experts for evaluation of research projects for the Swiss National Science Foundation and the Netherlands Organization for Scientific Research.



Event streaming: <https://bit.ly/fabiostella2023>