Department of Computer Science
香港城市大學
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IEEE Information Theory Society

COMPUTER SCIENCE COLLOQUIUM

Shannon's Information Measures and Markov Structures

SPEAKER **Prof. Raymond W. Yeung**

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DATE 29 Dec 2021 (Wednesday)
TIME 4:00 pm - 5:30 pm
VENUE **Online via zoom:**
https://www.cs.cityu.edu.hk/~ccha23/ITalk

ABSTRACT

The underlying set-theoretic structure of Shannon's information measures is specified by a signed measure called the I-Measure. Based on this theory, Shannon's information measures can be represented as an information diagram, which is a specialization of a Venn diagram. When the random variables form a Markov random field (MRF), the I-Measure exhibits a much simpler structure, and so it is possible to simplify the information diagram. Back in the 1990s, we already knew how to construct the information diagram for the special case of a Markov chain. Recently, through the study of the subfields of an MRF, we have developed a recursive procedure for constructing the information diagram for an MRF. In this talk, I will tell this story from the very beginning.

BIOGRAPHY

Raymond W. Yeung is a Choh-Ming Li Professor of Information Engineering at The Chinese University of Hong Kong (CUHK). He received his B.S., M.Eng., and PhD degrees from Cornell University in Electrical Engineering in 1984, 1985, and 1988, respectively. Before joining CUHK in 1991, he was a Member of Technical Staff at AT&T Bell Laboratories. A co-founder of the field of network coding, he has been serving as Co-Director of the Institute of Network Coding at CUHK since 2010. He is the author of the books A First Course in Information Theory (Kluwer Academic/Plenum Publishers, 2002) and Information Theory and Network Coding (Springer 2008), which have been adopted by over 100 institutions around the world. In spring 2014, he gave the first MOOC in the world on information theory that reached over 60,000 students.

He is a recipient of the 2005 IEEE Information Theory Society Paper Award, the Friedrich Wilhelm Bessel Research Award from the Alexander von Humboldt Foundation in 2007, the 2016 IEEE Eric E. Sumner Award, the 2018 ACM SIGMOBILE Test-of-Time Paper Award for his seminal paper on network coding published in 2000, the 2021 IEEE Richard W. Hamming Medal, and the 2022 Claude E. Shannon Award. In 2015, he was named an Outstanding Overseas Chinese Information Theorist by the China Information Theory Society. He is a Fellow of the IEEE, Hong Kong Academy of Engineering Sciences, and Hong Kong Institution of Engineers.

All are welcome!

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