THE CHINESE UNIVERSITY OF HONG KONG

Department of Information Engineering

Seminar

In Favour of Posting

Minimum Entropy Probability Couplings

by

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Date : 7 July 2026 (Tuesday)
Time : 3:30pm – 4:30pm
Venue : Rm 513, 5/F, William M.W. Mong Engineering Building, CUHK

Abstract

The minimum entropy probability coupling problem aims to couple m probability mass functions (PMFs) in a way that minimizes the entropy of the joint PMF. This problem has applications in information theory, causal inference, transportation polytopes, randomness generation, and many more related areas. However, the computation of the minimum entropy coupling is known to be NP-hard. In this talk, we describe a number of known lower bounds on the minimum achievable entropy using tools like majorization and information spectrum. We also discuss several approximation algorithms and their optimality gaps.

Biography

Yanina Shkel is an Assistant Professor with École Polytechnique Fédérale de Lausanne, where she is affiliated with the Information Processing Group in the School of Computer and Communication Sciences. She received the B.S. degree in mathematics and computer science and the M.S. and Ph.D. degrees in electrical and computer engineering from the University of Wisconsin–Madison. Before graduate school, she was a Database Developer with Morningstar Inc. During graduate school, she spent her time with 3M Corporate Research, as an Intern. After completing her PhD in 2014, she was a Post-Doctoral Researcher with Princeton University and University of Illinois at Urbana–Champaign. She joined EPFL as a Scientist in 2019, and as an Assistant Professor in 2023. Her research interests include theoretical aspects of data science: in particular, statistics, cryptography, as well as information, learning, and coding theory. She was a recipient of the 2015 NSF Center for Science of Information (CSoI) Post-Doctoral Fellowship and the 2022 Swiss NSF Starting Grant.

**** ALL ARE WELCOME ****

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