

The Hong Kong University of Science and Technology

Seminar on Business Data Science

Department of ISOM

**Conditional Stochastic Interpolation for
Generative Learning**

By

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Date: 1 November, 2023 (Wednesday)

Time: 2:30pm – 3:30pm

Venue: Classroom 1027 (LSK Business Building)

Abstract

We present a novel framework, called the Conditional Stochastic Interpolation (CSI), which learns the stochastic differential equations for transporting between two empirically observed distributions. The proposed framework provides an effective solution to conditional generative modeling. The key idea is to learn the velocity function and the conditional score function based on conditional stochastic interpolation using deep neural networks, which is then used to construct a Markov process for the purpose of conditional sampling. We establish error bounds for learning the target conditional distribution via CSI in term of the KL divergence. Numerical experiments support our theoretical findings. We also illustrate the proposed method on image generation using benchmark data and the UK Biobank brain imaging data. This is joint work with Ding Huang, Ting Li and Guohao Shen.

Bio

Jian Huang is Chair Professor of Data Science and Analytics in the Department of Applied Mathematics at The Hong Kong Polytechnic University. He obtained his Ph.D. degree in Statistics from the University of Washington in Seattle. His research interests include machine learning, high-dimensional statistics, computational statistics, biostatistics, and bioinformatics. He has published widely in the fields of Statistics, Biostatistics, Machine Learning, Bioinformatics and Econometrics. He was designated a highly cited researcher in the field of Mathematics from 2015 to 2019 by the Web of Science group at Clarivate and included in the list of top 2% of the world's most cited scientists by Elsevier BV and Stanford University (2021). Professor Huang is a fellow of the American Statistical Association and a fellow of the Institute of Mathematical Statistics.

All interested are welcome!
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