

A Flexible Generative AI Framework for High-dimensional Data Analysis



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Analyzing high-dimensional data has been hindered by the challenges posed by the "curse of dimensionality." In response, we introduce a versatile computational framework known as Encoding Generative Modeling (EGM). EGM is designed to address fundamental problems in statistics and machine learning, such as density estimation, clustering, and causal inference. The core concept of EGM involves the learning of a pair of functions facilitating bidirectional transformations between a low-dimensional latent space and the high-dimensional observation data space. Harnessing the capabilities of generative AI, we are able to effectively learn these transformation functions. One distinguishing feature of EGM lies in its adaptability. By introducing various structures to the latent space within the EGM framework, we demonstrate its efficacy in modeling diverse statistical and machine learning problems. Our numeric results consistently showcase the superior performance of EGM across a variety of statistical and machine learning tasks compared to existing methods. Besides, we also provide the theoretical foundations of the EGM framework under different settings.

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133 Rosenau Hall

Zoom Link:

<https://unc.zoom.us/j/98423779288?pwd=b0tqYThCQTAXeDdTQ0FRY3RnazdwQT09>

Meeting ID: 984 2377 9288

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