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*Generative Ornstein-Uhlenbeck Markets via Geometric Deep Learning*

We consider the problem of simultaneously approximating the conditional distribution of market prices and their log returns with a single machine learning model. We show that an instance of the Geometric Deep Network (GDN) model solves this problem without having prior assumptions on the market's "clipped" log returns, other than that they follow a generalized Ornstein-Uhlenbeck process with a priori unknown dynamics. We provide universal approximation guarantees for these conditional distributions and contingent claims with a Lipschitz payoff function.