A BAYESIAN DEEP LEARNING FRAMEWORK FOR UNCERTAINTY QUANTIFICATION OF STOCHASTIC PARTIAL DIFFERENTIAL EQUATIONS

Jeahan JUNG and Minseok CHOI

1) Department of Mathematics, Pohang University of Science and Technology, Pohang 37673, KOREA

Corresponding Author: Minseok CHOI, mchoi@postech.ac.kr

ABSTRACT

Solving stochastic partial differential equations (SPDEs) is a challenging task in uncertainty quantification. Various methods including polynomial chaos has been developed over the past few decades to deal with this problem. However, the computational cost grows exponentially as the dimension increases termed as the curse of dimensionality. To this end we propose a Bayesian deep learning framework to solve high-dimensional SPDEs. Numerical examples are presented to illustrate the efficacy of the proposed method.