Structural Reliability Analysis Using Extreme Learning Machine

Authors : Mehul Srivastava, Sharma Tushar Ravikant, Mridul Krishn Mishra

Abstract : In structural design, the evaluation of safety and probability failure of structure is of significant importance, mainly when the variables are random. On real structures, structural reliability can be evaluated obtaining an implicit limit state function. The structural reliability limit state function is obtained depending upon the statistically independent variables. In the analysis of reliability, we considered the statistically independent random variables to be the load intensity applied and the depth or height of the beam member considered. There are many approaches for structural reliability problems. In this paper Extreme Learning Machine technique and First Order Second Moment Method is used to determine the reliability indices for the same set of variables. The reliability index obtained using ELM is compared with the reliability index obtained using FOSM. Higher the reliability index, more feasible is the method to determine the reliability.

Keywords : reliability, reliability index, statistically independent, extreme learning machine
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