Multivariate global sensitivity analysis for the tubular structure using neural network

†*Pan Wang[1], Shiwang Tan[1]

[1]School of Mechanics, Civil Engineering & Architecture, Northwestern Polytechnical University, China.

*Presenting author & †Corresponding author: panwang@nwpu.edu.com

Abstract

This work investigates the global sensitivity analysis technique with multivariate outputs which can be used to identify the influential factors for the complex structural failure analysis. For the tubular structure with threaded connection, the failure can be divided into strength failure and seal failure. With the FE model of tubular structure, the global sensitivity analysis is performed for the two failure mode simultaneously. To calculate the global sensitivity efficiently, the neural network is employed which can deal with the dependence during the multivariate outputs.

Keywords: Global sensitivity, Tubular structure, Failure, Neural network