

Title: Data-driven approach for power system probabilistic analysis

Abstract:

With the increasing uncertainties, probabilistic analysis has gained significant importance in power industries. However, traditional probabilistic analysis, including reliability analysis, risk assessment, and stochastic optimization, is normally time consuming. The heavy computational burden has become a bottleneck of their practical applications. Data-driven methods have the potential to overcome the computational barriers in the probabilistic analysis. For example, data-driven methods can extract the key feature of the uncertainty set (injection uncertainty and topology uncertainty) to reduce the computational effort; data-driven methods can directly project the output from the input based on historical data information. In this presentation, we will show the current achievements on the data-driven solutions for probabilistic analysis, which may promote the practical applications of probabilistic analysis in power industries. Potential challenges of data-driven probabilistic analysis in power industries will be discussed.