Industrial Engineering Department
Friday Seminar Series

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Friday, November 11, 2016 at 10am

L2D2

Financial Stress Testing:

A Data Analytics Approach on Model Risk and Capital Planning

The financial meltdown of 2008 had a devastating impact on global economy and resulted in the most severe economic recession since the Great Depression in 1930s. A number of systematically important financial firms and bank holding companies (BHCs) went on the verge of bankruptcy, and the subsequent socioeconomic implications were just part of the aftermath. The major contributing factors in that crisis perceived to be the excessive risks taken by financial institutions, and errors in the models that were used by banks and other financial firms. The Dodd-Frank Act of Stress Testing (DFAST) was a response by the Congress to that crisis in order to rigorously apply the financial stress testing and forward-looking capital planning in order to hedge the risk of potential financial crisis in the future. This resulted in unprecedented scrutiny on risk management practices and appropriate use of financial models by systematically important BHCs. Financial stress testing as a "what-if" analysis measures the sensitivity of a portfolio, or a financial system to plausible shocks. It involves identification of risk and return drivers, input data analysis, the use of an appropriate methodology for mathematical modeling and computing, accuracy of the outcomes, and correct interpretation of the results. In the current regulatory environment—and with the increasing complexity of financial systems and products—, financial stress testing has become more complex, sophisticated, and even confusing. Data analytics has become the epicenter of modern risk management and regulatory compliance in the U.S. financial industry. An overview of the current industry practice on financial stress testing is presented. The commonly used methodologies and analytics approaches are introduced. The near future trend will be discussed, and the roles that industrial engineers can play in the industry are highlighted.

Biography: Dr. Ali Arab is a Senior Consultant of Model Risk and Capital Management within the Data Management and Advanced Analytics Solution of Protiviti Inc., a global consulting firm in New York City. Prior to joining Protiviti, he was with the Electric Power Analytics Consortium at the University of Houston where he developed several asset management and economic risk optimization models for smart grids under hurricane effects and manmade disasters. His research at University of Houston was supported by National Science Foundation, and two Fortune 500 companies, Centerpoint Energy and Direct Energy. Prior to that, he spent several years as Consultant, Engineering Lecturer, and Project Planner in various companies. His areas of expertise include advanced analytics, smart grid resiliency, model risk management, stochastic modeling, and economic decision making under risk. His articles have appeared in various conference proceedings and flagship scholarly journals such as IEEE Transactions on Reliability, IEEE Transactions on Smart Grid, and Journal of Intelligent Manufacturing, among others. He provided consulting solutions in the area of financial stress testing and model risk management to a number of top tier U.S. investment banks, a Canadian retail bank, a Swiss financial firm, a U.S. government loan agency, and a group of international banks and swap dealers, among others. Dr. Arab has a Ph.D. in Industrial Engineering from the University of Houston.