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Order-of-addition Experiments: Design and Analysis

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11:45 AM

110 Frelinghuysen Road
Hill Center, Room 552

Zoom Meeting: Meeting ID: 99075124232
Password: 952486

<https://rutgers.zoom.us/j/99075124232?pwd=UDdPVjRncXZFcXpvcFE0OWJyMVdSUT09>

Light refreshments will be served

Abstract: In Fisher (1971), a lady was able to distinguish (by tasting) from whether the tea or the milk was first added to the cup. This is probably the first popular Order of Addition (OofA) experiment. In general, there are m required components and we hope to determine the optimal sequence for adding these m components one after another. It is often unaffordable to test all the $m!$ treatments (for example, $m!=10!$ is about 3.5 millions), and the design problem arises. We consider the model in which the response of a treatment depends on the pairwise orders of the components. The optimal design theory under this model is established, and the optimal values of the D-, A-, E-, and M/S-criteria are derived. For Model-Free approach, an efficient sequential methodology is proposed, building upon the basic concept of quick-sort algorithm, to explore the optimal order without any model specification. The proposed method is capable to obtain the optimal order for large m (≥ 20). This work can be regarded as an early work of OofA experiment for large number of components. Some theoretical supports are also discussed. One case study for job scheduling will be discussed in detail.

Bio: Dr. Dennis K. J. Lin is a Distinguished Professor and Head of statistics Department at Purdue University. His research interests are quality assurance, industrial statistics, data science, and response surface. He has published near 300 SCI/SSCI papers in a wide variety of journals. He currently serves or has served as associate editor for more than 10 professional journals and was co-editor for *Applied Stochastic Models for Business and Industry*. Dr. Lin is an elected fellow of ASA, IMS and ASQ, an elected member of ISI and RSS, and a lifetime member of ICSA. He is an honorary chair professor for various universities, including a Chang-Jiang Scholar at Renmin University of China, Fudan University, National Taiwan Normal University, and National Chengchi University (Taiwan). His recent awards including, the Youden Address (ASQ, 2010), the Shewell Award (ASQ, 2010), the Don Owen Award (ASA, 2011), the Loutit Address (SSC, 2011), the Hunter Award (ASQ, 2014), the Shewhart Medal (ASQ, 2015), the SPES Award (ASA-SPES, 2016), the Chow Yuan-Shin Award (2019), and the Deming Lecturer Award (JSM, 2020).

