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Department of Statistics

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Analytics of Early Warning Systems

Wednesday, September 27, 2023
11:50 AM
110 Frelinghuysen Road, Hill Center, Room 552

Zoom Meeting: Meeting ID: 943 6913 4974
Password: 914221

https://rutgers.zoom.us/j/94369134974?pwd=RGhlNHRlSlJEQUNmaFBBSi83bjlXZz09

Light refreshments will be served

Abstract: Early warning systems (EWS) are extensively employed in various sectors, including business, industry, healthcare and other domains where handling massive and/or intensive data streams is essential. At the heart of an EWS typically lies a search engine designed with a specific purpose: to identify pertinent statistics warranting engineering attention and to provide sufficient information for ranking these statistics according to the preferences of diverse user groups. The key analytic problems within this context encompass: (a) swift detection of evolving unfavorable conditions (UCs) while maintaining a predefined low rate of false alarms, (b) alarm prioritization, (c) efficient diagnostic procedures (d) search for a root cause and corrective actions, (e) evaluation of the current process state, (f) setting target zones for the process parameters, and (g) user interface management. One of the key challenges in this endeavor is the assimilation of extensive domain knowledge, given that many of the UCs of interest are typically not represented in the historical data. We explore this challenge along with other aspects of EWS design, and the statistical methodologies instrumental in addressing them. Additionally, we delve into practical applications in the areas of Supply Chain Management, Data Storage and Semiconductor Manufacturing.

Bio: Emmanuel Yashchin received the Diploma in applied mathematics from Vilnius State University (U.S.S.R.) in 1974, the M.Sc. degree in Operations Research and the D.Sc. in Statistics from the Technion - Israel Institute of Technology, Haifa, in 1977 and 1981, respectively. In 1982 he was a Visiting Assistant Professor at the Iowa State University. Since 1983, he is a Research Staff Member in the IBM Thomas J. Watson Research Center. From 1996 to 2002, he served as the Manager of the Statistics Group in IBM Research. His research interests include Quality Control, Reliability, Statistical Modeling, Risk Analysis and Operations Research. He is an Elected Member of the International Statistical Institute, Fellow of the American Statistical Association and Senior Member of the American Society for Quality.