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"A Mathematical Approach to Identifying and Forecasting Shifts in the Mood of Social Media Users"

by Dr. Les Servi (The MITRE Corporation, Principal Staff/Group Leader in the Economic and Decision Analysis Center) *(This work is in collaboration with Dr. Sara Beth Elson)*

Abstract:

Social media offers a promising opportunity to identify and understand the moods of people using these platforms, just as conventional radars help one identify and understand physical motion. To date, many of the methods used to analyze social media in this way are qualitative, relying on the inputs of human subject matter experts. Those quantitative approaches which have been validated are in their infancy. This paper presents a new quantitative approach to characterizing the mood of social media users that can complement existing qualitative methods. This novel method combines a validated computer program (LIWC) with a mathematical algorithm to follow trends in past and present moods and detect breakpoints where those trends changed abruptly. First steps have also been taken to further develop this method so that it can also predict future trends in moods and possibly forecast related events. Validation is an important aspect of this part of the overall study. Finally, preliminary guidance for putting the output of the breakpoint analysis and forecasting into context is provided. The paper concludes with an overview of directions for continued research.

Bio:

Dr. Servi received his Ph.D. in engineering from Harvard University, worked at Bell Laboratories and GTE (now Verizon) Laboratories pursuing telecommunication research, served 1 year as a visiting scientist at Harvard University and MIT, and worked at MIT. He currently is a Group Leader at The MITRE Corporation. At MITRE he has contributed to a diversity of areas including the analysis of social media, portfolio analysis, cyber security, designing software test plans, and evaluating Human Social Culture Behavior (HSCB) government sponsored projects. In 2010-11, he served on a Defense Science Board task force on Counterinsurgency (COINS) and Intelligence, Surveillance, and Reconnaissance (ISR) Operations.

Dr. Servi has an extensive publication record in the area of Operations Research with five papers having more than 20 citations and 10 patents derived from his analysis. He has been very active in INFORMS and served on its Board of Directors for 6 years. In 2004 he was named Fellow of INFORMS. He has been an editor of *Operations Research*, *Management Science*, *INFORMS Journal of Computing*, and has served on Ph.D. thesis committees at Harvard University, MIT and Boston University.