



Seminar Experience

ELECTRICAL & COMPUTER ENGINEERING

Friday, October 10

10:00—11:00 am

FIU Engineering Center

EC Room # 1107

www.ece.fiu.edu



“Beyond Augmented Reality: Man-Machine Symbiosis and Cognitive Bias Mitigation”

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ABSTRACT

Decades of research indicate that humans are not rational decision-makers. Our decisions and assessments of situations we encounter and other individuals or groups are sometimes flawed because they are based on a limited acquisition and rational analysis of information, and strongly influenced by our past experiences. Our short-term and long-term perception and satisfaction with a given experience can differ drastically and affect future decisions. The outcomes of decisions negatively impacted by cognitive biases affect individuals, businesses and society. Their impacts can be temporary and mildly annoying, such as buying an unneeded or wrong tablet or triggering an unwarranted fight with a spouse, or long term and costly, such as marrying the wrong person, wrong product or business decision (e.g., Edsel, N-Gage mobile phone/handheld game system, changing change the formula for Coca-Cola and rebranding it “New Coke,...) or creating an environmental disaster (e.g., Deepwater Horizon oil spill).

In this talk we review evidence of cognitive biases in faulty decision-making in oil and gas drilling. In particular, we provide a summary of the faulty decisions that led to the Macondo disaster. Next, we develop mathematical models of human decision-making that incorporate the effect of cognitive biases. These models start from an optimal Bayesian decision making algorithm and modify it to account for cognitive biases and the effect of past information seen by the individual. Finally, we show how it is possible to mitigate cognitive biases in binary hypothesis testing problems by properly selecting and sequencing information presented to an individual.

BIOGRAPHY

Ahmed H Tewfik received his B.Sc. degree from Cairo University, Cairo Egypt, in 1982 and his M.Sc., E.E. and Sc.D. degrees from MIT, in 1984, 1985 and 1987 respectively. He is the Cockrell Family Regents Chair in Engineering and the Chairman of the Department of Electrical and Computer Engineering at the University of Texas Austin. He was the E. F. Johnson professor of Electronic Communications with the department of Electrical Engineering at the University of Minnesota until September 2010. Dr. Tewfik worked at Alphatech, Inc. and served as a consultant to several companies. From August 1997 to August 2001, he was the President and CEO of Cognicity, Inc., an entertainment marketing software tools publisher that he co-founded, on partial leave of absence from the University of Minnesota. His current research interests are in cognitive augmentation through man-machine symbiosis and mobile computing, minimally invasive surgery and brain computing interfaces. Prof. Tewfik is a Fellow of the IEEE. He was a Distinguished Lecturer of the IEEE Signal Processing Society in 1997 - 1999. He received the IEEE third Millennium award in 2000. He was elected to the position of VP Technical Directions of the IEEE Signal Processing Society in 2009 and served on the board of governors of that Society from 2006 to 2008. He has given several plenary and keynote lectures at IEEE conferences.