Title: On a Niche for Engineers in Stock Trading Research

Speaker: Prof. B. Ross Barmish, University of Wisconsin-Madison

Abstract:

In this seminar, I will describe a new paradigm for stock market trading which does not use a model for the time-varying price \( p(t) \). Neither predictions about future stock prices nor a parameter estimation scheme is involved. Instead, our new paradigm, based on feedback control considerations, involves reactive adaptation of the investment level \( I(t) \) to trends in the gains and losses over time. In the finance literature, such a model-free scheme falls under the umbrella of "technical analysis." After explaining what is meant by technical analysis, I will address a longstanding conundrum in finance: Why is it that so many asset managers, hedge funds and individual investors trade stock using technical analysis despite the existence of a significant body of literature claiming that such methods are of questionable worth with little or no theoretical rationale? Whereas existing work on this question by academics and practitioners in finance involves statistical analysis of a trading algorithm via back-testing with historical data, our feedback-based approach is aimed at providing a theoretical rationale which explains why such trading methods result in either success or failure.

Bio:

B. Ross Barmish received the Bachelor's degree in Electrical Engineering from McGill University in 1971. In 1972 and 1975 respectively, he received the M.S. and Ph.D. degrees, both in Electrical Engineering, from Cornell University. From 1975 to 1978, he served as Assistant Professor of Engineering and Applied Science at Yale University. From 1978 to 1984, he was as an Associate Professor of Electrical Engineering at the University of Rochester and in 1984, he joined the University of Wisconsin, Madison, where he is currently Professor of Electrical and Computer Engineering. From 2001 to 2003, he was with the Department of Electrical Engineering and Computer Science at Case Western Reserve University, where he served as Department Chair while holding the endowed Nord Professorship.

Over the years, he has been involved in a number of IEEE Control Systems Society activities such as associate editorships, conference chairmanships, the Board of Governors and prize paper committees. He has also served as a consultant for a number of companies and is the author of the textbook New Tools for Robustness of Linear Systems, Macmillan, 1994. While his earlier work concentrated on robustness of dynamical systems, his current research concentrates on building a bridge between feedback control theory and trading in complex financial markets.

Professor Barmish is a Fellow of both the IEEE and IFAC for his contributions to the theory of robustness of dynamical systems. He received the Best Paper Award for Journal Publication in Automatica, covering a three-year period, on two consecutive occasions from the International Federation of Automatic Control. He has also given a number of plenary lectures at major conferences. In December 2012, Professor Barmish was named by the IEEE Control Systems Society as the winner of the 2013 Bode Prize. In conjunction with this field award, he provided a keynote plenary at the 2013 IEEE Conference on Decision and Control, held in Florence, Italy.