B. Ross Barmish (USA) On the Use of Feedback Controllers for Stock Trading

Abstract: The focal point of this plenary is an overview of a new line of research which begins with the recognition that many stock-trading algorithms can be reformulated in terms of classical feedback control loops. This opens the door to the use of many powerful control-theoretic tools that have not been considered to date. In contrast to the existing finance literature, the control strategies which we describe are model free. Neither a forecast nor parameterized model for the time-varying stock-price p(t) are used by the controller to generate buy and sell signals. To generate these signals and the associated investment level I(t), we treat p(t) in much the same way as an external disturbance is treated in robust control. That is, we seek to robustly satisfy various performance specifications involving the gain-loss function g(t). To this end, the control law which generates investment I(t) involves an adaptive scheme which is driven by g(t) itself. This talk includes the details of the paradigm described above and a number of application examples involving historical data.