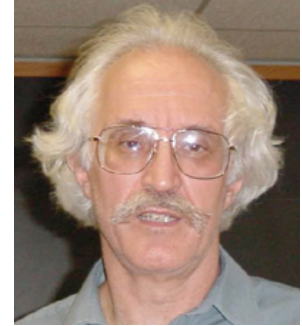


**When:** Friday 13:50 – 14:50

**Where:** ETB 1035

**Speaker:** Prof. Edward R. Dougherty

Robert M. Kennedy '26 Chair Professor  
Distinguished Professor  
Department of Electrical & Computer Engineering  
Dwight Look College of Engineering  
Texas A&M University



**Title:** Optimal Experimental Design

**Date:** 09-29-2017

**Abstract:** The basic problem of engineering is to design an operator to optimally achieve a desired objective when applied to a system. Examples are an optimal linear filter on a random signal, an optimal classifier on a class of feature vectors, an optimal controller on a dynamical system, and an optimal drug intervention in a genetic regulatory system. A cost function quantifying the objective is postulated and is minimized by some operator from a designated family of operators. But what if the system is only partially known? In this case, the actual system of interest belongs to some uncertainty class of possible systems and the best one can do is find an operator that achieves optimal performance across the uncertainty class. One way of doing this is to find an operator that has minimal average cost. Performance can be improved by reducing the uncertainty via experiment. An immediate question arises: among all possible experiments, which one optimally reduces uncertainty relative to the objective quantified by the cost function?

**Biography:** Dougherty holds a Ph.D. in mathematics from Rutgers University and an M.S. in Computer Science from Stevens Institute of Technology, and has been awarded the Doctor Honoris Causa by the Tampere University of Technology. He is Distinguished Professor at Texas A&M, a fellow of both IEEE and SPIE, has received the SPIE President's Award, and served as the editor of the SPIE/IS&T Journal of Electronic Imaging. At Texas A&M, he has received the Association of Former Students Distinguished Achievement Award in Research, been named Fellow of the Texas Engineering Experiment Station and Halliburton Professor of the Dwight Look College of Engineering. He is author of 16 books and author of more than 300 journal papers.