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"Stochastic Decision Processes and Applications"

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Consider the situation when a security intrusion is attempted in a given domain within an information network. Fast and reliable automated procedures have to be in place to: (a) detect the intrusion, and (b) locate the source node of the intrusion. Although much research has been done on (a), little is found in the available literature on (b). As explained in this talk, stochastic decision models can be used to find solutions that fill the above-mentioned void. In more generality, in this talk I will present models for making decisions under uncertainty. In particular, controlled Markov-chain models are considered. Commonly, rules for making decisions are obtained by optimizing a performance criterion that only takes into account expected (or average) measures of aggregated costs. Thus, "optimal" policies may exhibit an undesirable large variance about the predicted optimal expected cost values. I will overview recent results in methodology and applications dealing with models with risk (e.g., variance) sensitive performance criteria: optimality equations, structured solutions, and applications to (a) security and fault management in telecommunication networks, and (b) semiconductor manufacturing.

Emmanuel Fernandez received his Ph.D. in Electrical and Computer Engineering from the University of Texas at Austin in 1991, with concentration in Information and Systems Science. He then joined the faculty of the Systems and Industrial Engineering Department at the University of Arizona, initially as an Assistant Professor, and subsequently as a tenured Associate Professor. Since September of 2000 he is with the Electrical and Computer Engineering and Computer Science Department at the University of Cincinnati. His areas of interest are stochastic models and decision processes, information technology, and applications in the areas of telecommunication networks, semiconductor manufacturing, and logistics.