LD6-08 Diagramas de influencia: número especial de DA 3 de abril de 2006

Estimados suscriptores:

Los diagramas de influencia son una de las formas de modelación más importantes desarrolladas para analizar decisiones. Para reconocer su importancia y presentar avances en la modelación, la revista especializada Decision Analysis (editada por la Decision Analysis Society de INFORMS) ha dedicado dos números especiales al tema (Volumen 2, números 3 y 4).

El primero de esos números incluye la reproducción del artículo que presentó originalmente al público en general los Diagramas de Influencia (Howard y Matheson 1981) que, curiosamente, no había sido publicado como artículo en revista especializada, sino en la compilación sobre Análisis de Decisiones editada por Ronald Howard y James Matheson en 1983. Ese número también incluye un artículo en la que Howard y Matheson narran brevemente la historia del desarrollo de los diagramas. Ahí platican que el artículo seminal no fue publicado en una revista especializada porque los editores en esa época no apreciaban la importancia de ese tipo de modelo. Sí, todos comentemos errores.

Les anexo los resúmenes de algunos de los artículos de estos números especiales. Espero que les parezcan interesantes.

Con mis mejores deseos.

Roberto Ley Borrás

Influence Diagram Retrospective
Ronald A. Howard, James E. Matheson
Since the invention of Influence diagrams in the mid-1970s, they have become a ubiquitous tool for representing uncertain situations. This single diagram replaced awkward manipulations of decision trees and nature's trees with a single representation that displays both the sequential and informational structure of decisions. The diagram permits high-level graphic communication, clear assessments and computation in a single graphical system. This retrospective discusses the evolution and application of influence diagrams.

Describing and Valuing Interventions That Observe or Control Decision Situations
David Matheson, James E. Matheson
The value of information and value of control calculations have long been two separate parts of a decision, analyst's efforts to extract as much insight as possible from a decision model. This paper unifies these concepts as interventions that modify the structure of the original problem, which have two key properties, purity and quality. Purity is an idealization that leads to Howard canonical form, clarifies the definition of control intervention, and allows us to extend and correct the calculation of the value of control. Quality is a characteristic that leads to generic models of imperfect intervention, which, because of their equivalence to any pure intervention, prevent misguided recommendations when the value of a perfect intervention is high but the value of a somewhat imperfect intervention is low. Quality is a number between 0 and 1 that normalizes and allows comparison of imperfect interventions between applications having very different value scales.

The Influence of Influence Diagrams on Artificial Intelligence
Craig Boutilier
Howard and Matheson's article "Influence Diagrams" has had a substantial impact on research in artificial intelligence (AI). In this perspective, I briefly discuss the importance of influence diagrams as a model for decision making under uncertainty in the AI research community; but I also identify some of the less direct, but no less important, influences this work has had on the field.

Influence Diagrams: A Practitioner's Perspective
Dennis M. Buede
I have found influence diagrams to be indispensable in building models with clients, keeping track of what probability distributions are needed, explaining the results of calculations to clients, explaining the analysis process to clients, and teaching decision analysis to undergraduate and graduate students. As a professional decision analyst and as a teacher I have found influence diagrams to be almost as critical as a laptop computer.

The Influence of Influence Diagrams in Medicine
Stephen G. Pauker, John B. Wong
Although influence diagrams have used medical examples almost from their inception, that graphical representation of decision problems has disseminated surprisingly slowly in the medical literature and among clinicians performing decision analyses. Clinicians appear to prefer decision trees as their primary modeling metaphor. This perspective examines the use of influence diagrams in medicine and offers explanations and suggestions for accelerating their dissemination.