

Info-Gap Theory: Concepts and Applications

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Abstract

General principles should guide strategic planning in engineering design, public policy, international relations, medical decisions and many other areas of human endeavor. However, decision makers know that general principles will sometimes be invalid in practice because of unanticipated contingencies. The challenge facing the strategic planner is to balance between fundamental long-range strategic thinking, and pragmatic solution of pressing problems. At one extreme the strategist ignores contingencies and insists on adherence to general principles. At the other extreme, the strategist abdicates and devotes all innovation and initiative to the solution of specific problems. The problem of balancing between these extremes derives in large measure from the severe uncertainties facing the decision maker.

Info-gap decision theory provides decision-support tools for managing the challenges of planning and decision under severe uncertainty. We discuss the method of robustly satisfying critical requirements as a tool for protecting against pernicious uncertainty. We also describe the method of opportune windfalling as a tool for exploiting propitious uncertainty.

These ideas will be illustrated by considering two examples: policy formulation for timely recovery from catastrophe, and optimal monitoring and surveillance.

Selected References (see also info-gap.com)

Yakov Ben-Haim, 2006, *Info-Gap Decision Theory: Decisions Under Severe Uncertainty*, 2nd edition, Academic Press.

Yakov Ben-Haim, 2010, *Info-Gap Economics: An Operational Introduction*, Palgrave-Macmillan.

Michael Smithson and Yakov Ben-Haim, 2015, Reasoned Decision Making Without Math? Adaptability and Robustness in Response to Surprise, *Risk Analysis*, vol.35, #10, pp.1911-1918. Link to pre-print at: <http://info-gap.com/content.php?id=23>

Yakov Ben-Haim, Craig D. Osteen and L. Joe Moffitt, 2013, Policy Dilemma of Innovation: An Info-Gap Approach, *Ecological Economics*, 85: 130-138. Link to pre-print at: <http://info-gap.com/content.php?id=88>

Barry Schwartz, Yakov Ben-Haim, and Cliff Dacso, 2011, What Makes a Good Decision? Robust Satisficing as a Normative Standard of Rational Behaviour, *The Journal for the Theory of Social Behaviour*, 41(2): 209-227. Link to pre-print at: <http://info-gap.com/content.php?id=23>