Uncertainty and its Analysis in Engineering Systems

Lempert et al.: "Confronting Surprise"

- We routinely overestimate the confidence with which we can know the future
- Deep uncertainty & complexity
  - Decision makers' dilemma of surprise
- Robust adaptive planning (RAP) approach
  - Multiple scenarios
  - Robustness criteria
  - Adaptivity
  - Breaking scenarios & hedging actions

Taleb: “The Black Swan”

- Black Swan events characterized by:
  - Rarity
  - Extreme impact
  - Retrospective predictability
- Aggressive ignorance & Platonicity
- We need to understand rare and extreme events to figure out common ones
- Mandelbrotian geometry
- Gaussians as “Great Intellectual Fraud”

Discussion Question #1

Is Lempert's RAP method and "safety valve" approach an effective means of anticipating and coping with the fallout from the Black Swan events Taleb warns about? What types of surprises might it fail to anticipate?

Discussion Question #2

Is Taleb too hard on Gaussian analysis? What role, if any, should it play in dealing with uncertainty? Is the normal necessarily irrelevant?

Discussion Question #3

Both Taleb and Lempert emphasize that we tend to overestimate our own ability to predict future events despite repeated failures. Are there ways we can communicate ideas about uncertainty more effectively to combat this "aggressive ignorance"?

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