Biases and Assumptions

ESD.342 – Spring 2006

Assignment 1
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Biases and Assumptions

- **General engineering biases**
  - Tangibles and Intangibles
    - Importance of quantification and Measurement
    - Difficulty faced in quantifying intangibles
    - Two options: Ignore the intangibles or decouple the two
- **Process/ Systems engineering biases**
  - Stochastic Models versus Deterministic models
    - Most engineering models are a combination both types.
    - Stochastic models tend to favor a ‘black box’ approach and Deterministic models capture the physical process.
    - Deterministic models are always incomplete and contain imperfections that are ignored.
    - The level of detail and the number of unknown parameters in a deterministic model is high.
    - Example: Throwing a six sided dice.

Biases and Assumptions

- **Detailed design engineering: Design of Experiments**
  - Empirical results versus theoretical results
    - Favor empirical models over theoretical models
    - Influences methods or tools used for analyses. For e.g., Simulation methods versus analytical procedure.
  - Bridge between conceptual engineering design and detail design decisions
    - Conceptual design is highly subjective and the empiricism of the designer (at this stage) is very limited.