Balancing Uncertainty in Structural Decisions

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Risk analysis requires:

- Completeness
- Balance
Balanced risk:

- ideas
- limitations
Balanced effort:

- Principle of Consistent Crudeness
- Quality?
Uncertainty:

- Aleatoric
- Epistemic
- Surprisal (ontological)
Aleatoric:

• Noise
Epistemic:

• Distortion
Surprisal:

- The unexpected
- A common metric?
- A common framework?
Dealing with surprise:

(a) Consider all that can go wrong

- make the model more detailed
- tree approaches
- nuclear missile launch
Dealing with surprise:

(b) Minimise likelihood of error
   – Checking and QA
   – Indicator methods
Indicator methods:

- Pugsley/Blockley
- System health
- Missing: complexity, hubris
Dealing with surprise:

(c) Increase system resilience

- network resilience
  - scale-free networks
  - epidemics and cascading failure
Networks:

- Circuit theory
- Appropriate network
- Dependence between elements
- Different systems for different failures
Bringing it together:

- risk reduction – of course
- risk assessment – common metric
- balance of ATTENTION
  – a wise focus
"'BE CAREFUL! ALL YOU CAN TELL ME IS 'BE CAREFUL'?"
Confucious said:
Let your will be directed to System,
Pass your time in gentlemanly pursuits.