Value at Risk, Info-Gaps, and Engineering Decision Making

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The management of rare events is important in many areas of engineering, including flood risk management, design for extreme loads on structures, fault detection and diagnosis, innovative technologies for extreme environments such as space travel, and elsewhere. In this talk we will suggest that the concept of **value at risk** can be borrowed from financial economics and used productively in **engineering decision making**. However, this requires managing the **info-gaps** in our knowledge.

Much attention in financial economics has focussed in recent years on managing extreme events. The concept of value at risk (VaR) has become quite popular in portfolio management. The VaR is a quantile on the lower tail of the profit distribution. A major challenge in using the VaR to manage rare events is that the far tail of the distribution is poorly known.

In order for the VaR to be useful and reliable it is necessary to deal with the high uncertainty of the far tails of the distribution. It will be proposed that **info-gap decision theory** is useful in this respect.

The talk will summarize the use of VaR, the idea of info-gap robust-satisficing, and their combination. Simple examples will be discussed.

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