

# Uncertainty Management in Automobile Design

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## Abstract

The characterization and management of uncertainty in engineering design is critical to the rapid and successful execution of the vehicle development process. In support of a vehicle program, engineers struggle as they try to design to uncertain requirements and provide decision makers with credible, timely and robust estimates of a multitude of design related vehicle performance attributes. At the same time, the vehicle program managers are challenged with the task of integrating uncertain information across a large number of functional areas, assessing program risk and then making program level decisions that ultimately constrain the engineering design activity.

In this presentation I will briefly discuss the vehicle development process and my view of the role of engineering in support of that process. I will then discuss the importance of understanding and managing uncertainties; specifically as this relates to setting vehicle functional requirements and assessing designs relative to those requirements. I will present examples of how we can use formal approaches to engineering design that allow us to manage some common types of uncertainty and discuss some of the limitations of these methods. Finally, I will conclude by discussing a number of important challenges in this area and proposing some potential areas for collaborative research.