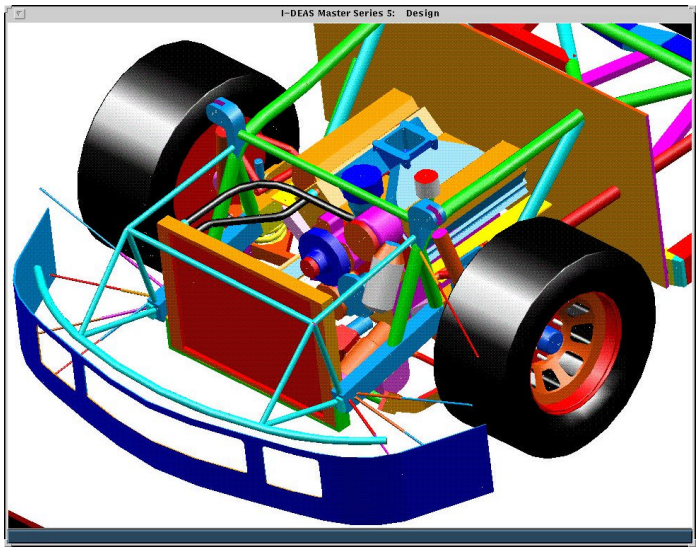
Project Title: **OPTIMIZATION OF VEHICLE RESPONSE TO COUPLED SUSPENSION PARAMETER CHANGES**



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Project Abstract:

Purpose-built high-performance vehicles operate in a narrow range of conditions that require a greater degree of tuning than that of vehicles for general roadway use, to attain optimum performance. Suspension kinematics and lateral load transfer distribution properties can be specifically adapted for optimum performance in a small number of specified maneuvers. Typically, parameters that directly affect some vehicle characteristic also have secondary effects. Thus, a significant level of coupling complicates the process of selecting final suspension parameters in the quest for optimum performance.

This project utilizes multi-body dynamic simulation codes to determine the kinematic properties of a suspension necessary to obtain desired handling (i.e. cornering) characteristics of a vehicle, and to determine optimal lateral load transfer distribution of the suspension. Sensitivity analysis will be utilized to determine which parameters display second-order effects with respect to critical performance characteristics, and a methodology to maximize or minimize the impact of these coupled parameters will be developed.

The results of the work will formalize a methodology to deal with coupling issues, which is applicable to general design problems. It will also identify ways to bring optimization into the fine-tuning of high performance vehicles in order to target the simultaneous improvement of more than one objective.

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