

## **Occupant Model Correlation Using A Multiobjective Evolution Strategy**

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### **Abstract**

Computer modeling has played important role and gained great momentum in product development as numerical methods, computer software and hardware technologies advance rapidly. Computer models (e.g. MADYMO) that simulate vehicle interior, restraint system, and occupants in various crash scenarios have been widely used to improve occupant safety. However, to build good occupant models, engineers often spend tremendous time on model correlation. One of the challenges of occupant model correlation is that it requires matching numerous injury curves with tests simultaneously, for examples: head injury, chest G, chest deflection, shoulder belt load, femur loads, neck load and moment. Traditionally, this model correlation task is done by a trial and error method. This paper formulates a multiobjective optimization problem to achieve model correlation for multiple injury curves concurrently. The problem is solved systematically by using a multiobjective evolution strategy. The method is applied to a real-world case study and the results demonstrate that the multiobjective evolution strategy is a useful tool to obtain a high quality occupant model.

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