Ford Motor Company – Optimized Rear Vehicle Seat Design

Overview
The Ford Motor Company requested a redesign of the rear seat for a small SUV Ford Escape such that when folded there is a zero degree angle between the cargo floor bed and the seat back. This has been a known issue at Ford for many years and the intent of this project is to gain a “fresh eyes” perspective on the issue. From the onset, it was realized that this issue could be solved through redesigning the folding linkages responsible for the folding action or through restructuring the contour style of the seat.

Objectives
The primary goal of this project was to create a zero degree folding angle on the rear seat of a Ford Escape. A secondary goal set by Ford was to achieve this angle while also increasing the overall comfort experienced by passengers.

Approach
- The team began this project by conducting thorough background research into both seat comfort design and dimensional synthesis for analysing linkage motion
- Benchmarking was conducted to understand the current competition on the market
- In an effort to increase passenger comfort, it was decided by the team to focus on the contours of the seat
- The Eames chair was selected as the primary prototype model due to its minimalist design and potential to reduce cushion thickness
- 3D scanned models of an authentic Eames chair were machined into foam prototypes and hand contoured to fit the existing seat frame
- Various foam densities were tested to add local compliance to the seat design
- Ford-supplied upholstery was then applied to the seat pan prototype to model Ford production quality
- CAD models were created to show potential changes to the seat belt guide clip
- A one-pull folding method of both the seat and head restraint proved possible during testing, provided that a properly sized cable is used

Outcomes
- Early comfort tests provided ample feedback to continue pursuing the Eames chair design in future Ford Escapes
- The new seat design reduced the folding angle by 3.5°