Evaluating your automotive interiors with a total immersion driving simulator

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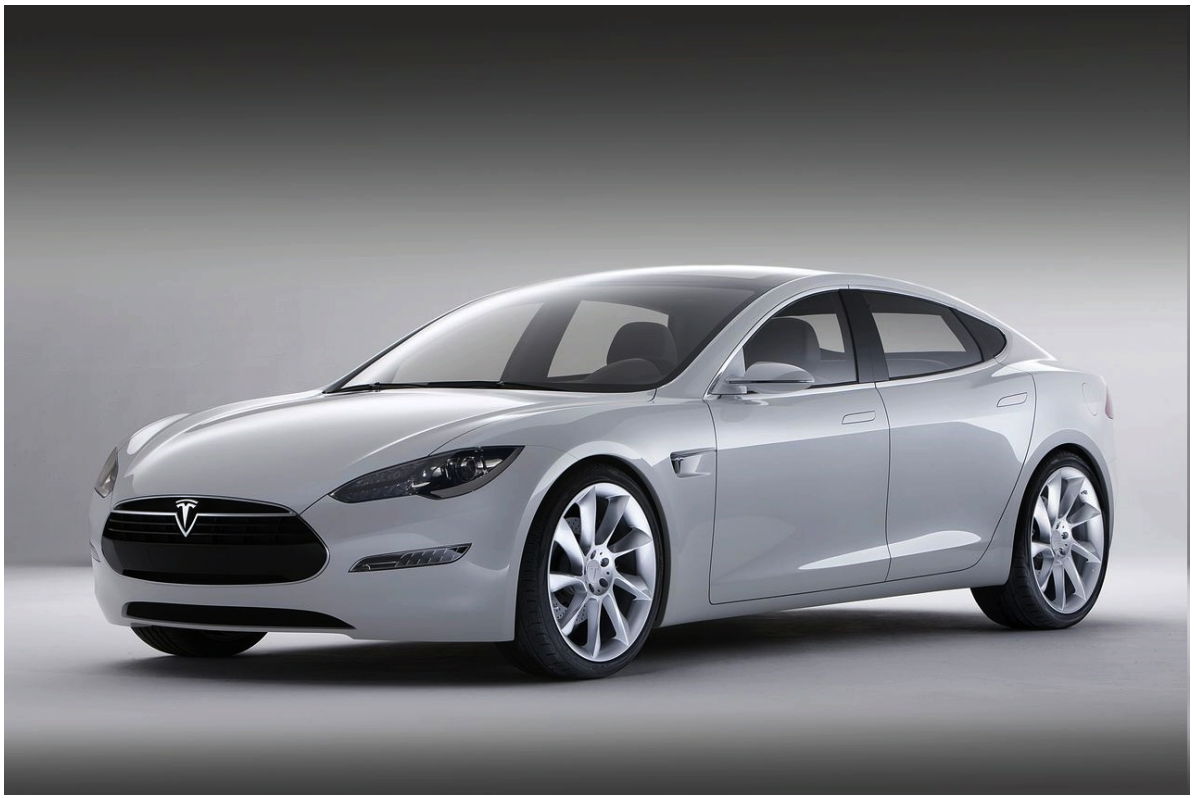
Evaluation and validation of interior designs

Macro economics and technology trends

- Electric vehicles



Evaluation and validation of interior designs

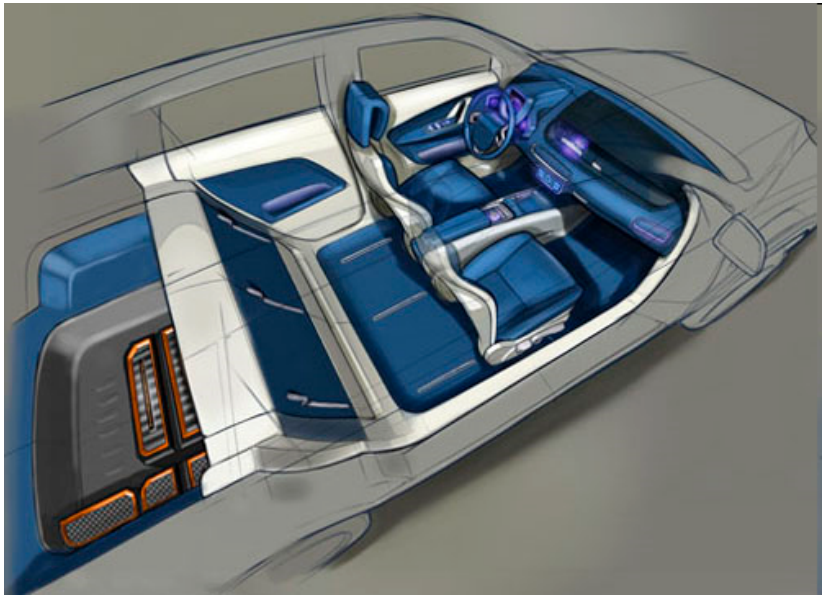
Macro economics and technology trends cont'd

- Integration of sensors and cameras
- Driver assist technologies
- Voice technologies, heads-up displays, interior lighting
- Navigation and entertainment ('infotainment')

Evaluation and validation of interior designs

Macro economics and technology trends cont'd

- New innovations in seating
- New materials
- Ride comfort and ride quality
- Market segmentations
- Brand recognition
- Globalization



The correlation between ergonomics and safety?

The human machine interface challenges

- Keeping your hands on the wheel and your eyes on the road
- Alternative concepts for steering and acceleration controls
- Implementing active safety without overwhelming the driver
- Matching ergonomics to customers and markets

How can you evaluate these new concepts?

The coalescing of test and simulation

- Create a realistic driving environment in the lab
- Add the human into the loop
- Integrate existing hardware
- Use simulation tools to create the virtual reality
- Integrate all to create a complete simulated driving environment

Why use a total immersion driving simulator?

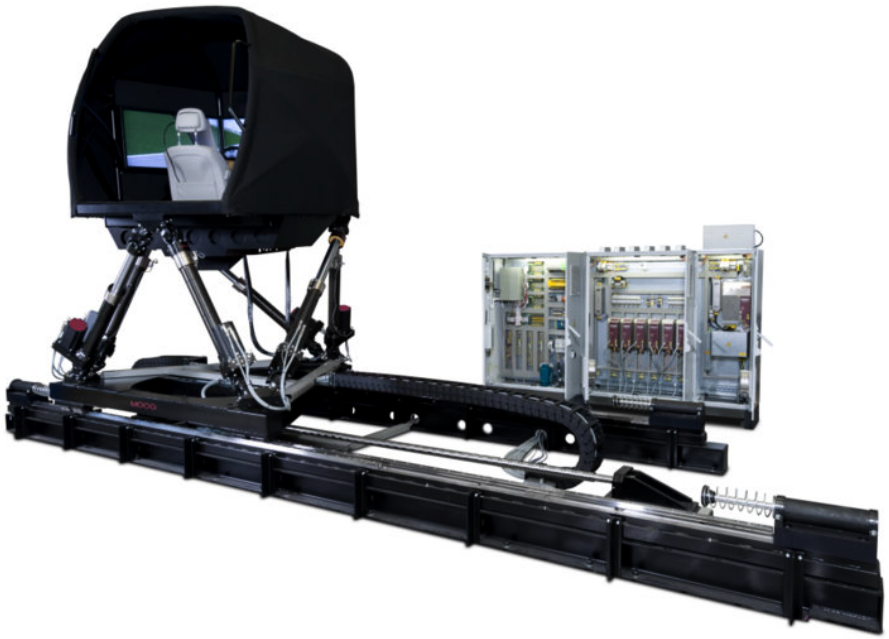
Motivations for realistic simulation

- Focus on user oriented design -> improve customer satisfaction
- Validate prototypes and/or concepts
- Provide quick design feedback
- Validate and improve virtual design models
- Reduce costs and time to market
- Benchmarking and standards development

What is a total immersion driving simulator?

Driving simulator building blocks

- Motion platform
- Linear rail or turn table
- Dome/cabin environment
- Audio and visuals
- Motion cueing, g-tilting
- Vehicle models



A 7 DOF driving simulator with lateral rail

Understanding the human in the loop factor

The role of perception in design

- Haptic feedback (steering, pedals)
- Audio, visual, and motion cues
- Evaluating the human and machine interface
- Effects of cabin environment on perceived driving quality
- Beauty by design (intelligent design)

The benefits of realistic simulation

Total immersion driving simulator results

- Improved perceived customer quality
- Accelerated time to market
- Reduced development and warranty costs
- Quick feedback for new designs
- Verification for changing regulations
- Bridge the gap between virtual design and reality

Questions?