

2015 Road Safety & Simulation International Conference
October 6-8, 2015, Orlando FL

Workshop - Virtual Reality (VR) and Augmented Reality (AR) for Transportation Research
Monday, October 5, 2015, 1:00-5:00 PM

VR/AR & Transportation – Examples from Industry

Human-Centered Development in Transportation

Need for new VR/AR tools!

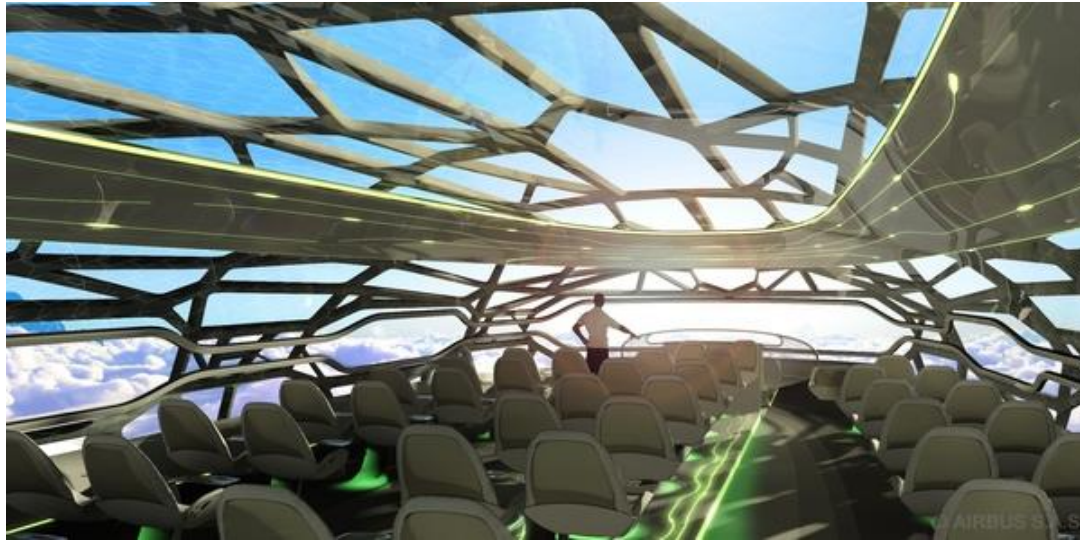
Oct 5th, 2015

Gilles GALLEE

Solutions Director

OPTIS headquarter, France





User Experience

Human-Centered

‘Affective’ & Safety Development

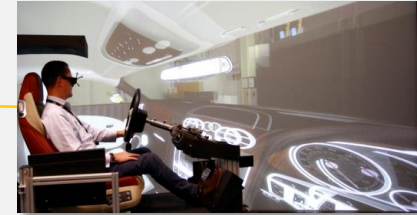
Human-Centered Development



 **Looking**
OBSERVING HUMAN EXPERIENCE

 **Understanding**
ANALYZING CHALLENGES & OPPORTUNITIES

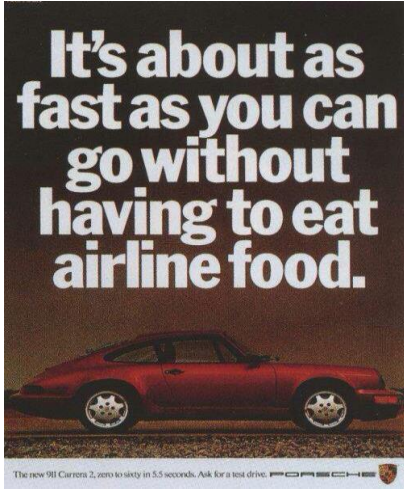
 **Making**
ENVISIONING FUTURE POSSIBILITIES



Trends & challenges for the automotive industry

Focus on driver





Perceived Value
& Differentiators

Vision
is **85%** of Perception



Complete new driving experience





Ergonomics

Visibility

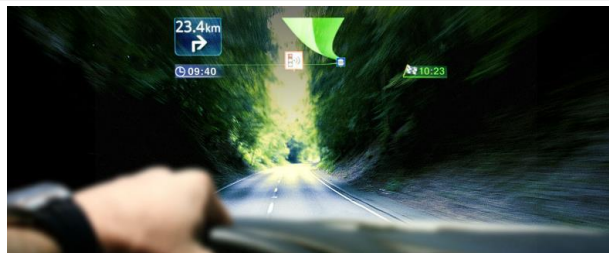
Readability

Reachability

Reflections & Glare Issues



Challenges – HUD & Augmented Reality inside the car



- ✓ Head-Up-Display
- ✓ AR Display
- ✓ Transparent pillars
- ✓ Transparent bonnet
- ...



Ambient

Homogeneous

Adaptive

Efficient

Weight

Electrical Consumption

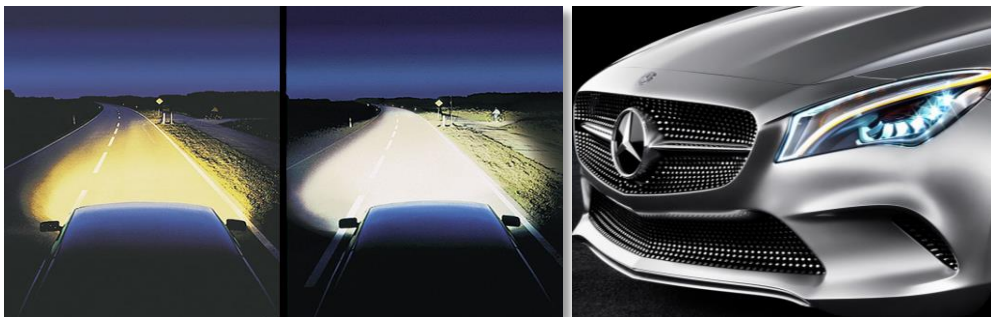
Performances



New acoustic HMI
spatialization

Custom sound engine

... and exterior sounds for
electric vehicle!

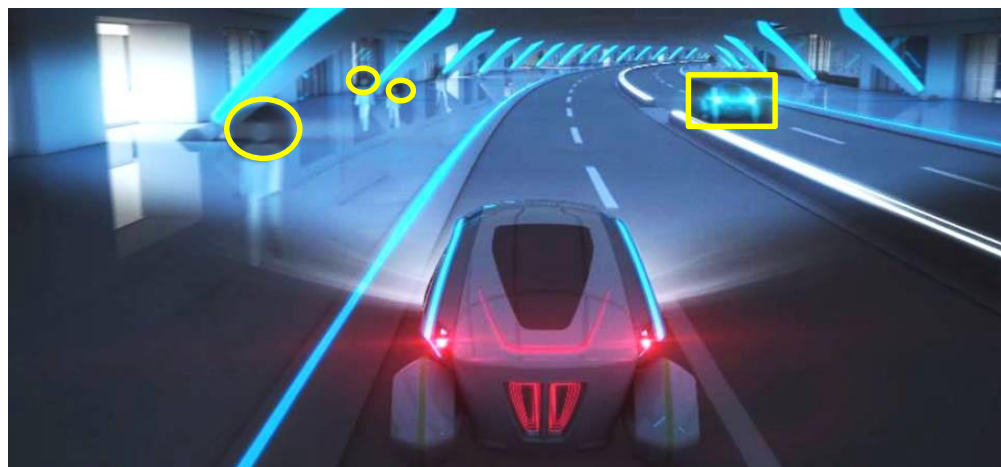


Major Style impact

represent 25% of the style

Increase Vision by Night

poor road lighting is stressful for 50% of people



Enhance vision

Highlight POI

Guide the driver



Studio vs. Real Context

Overall vs. Many Features



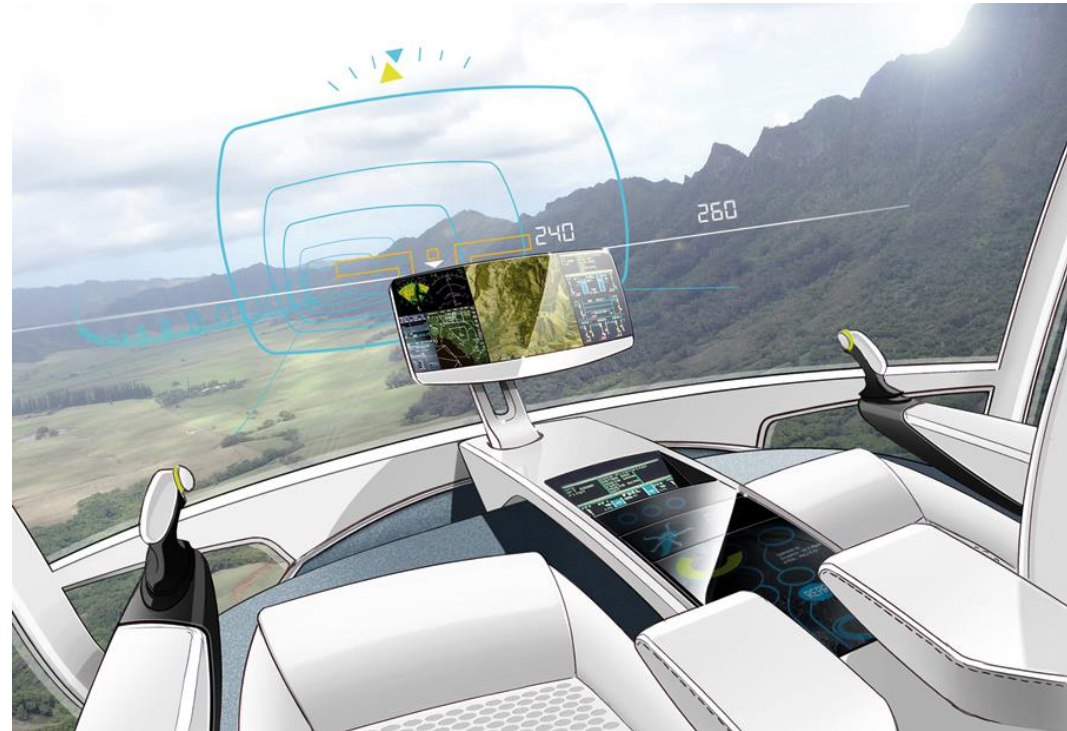
ConsumerReports.org

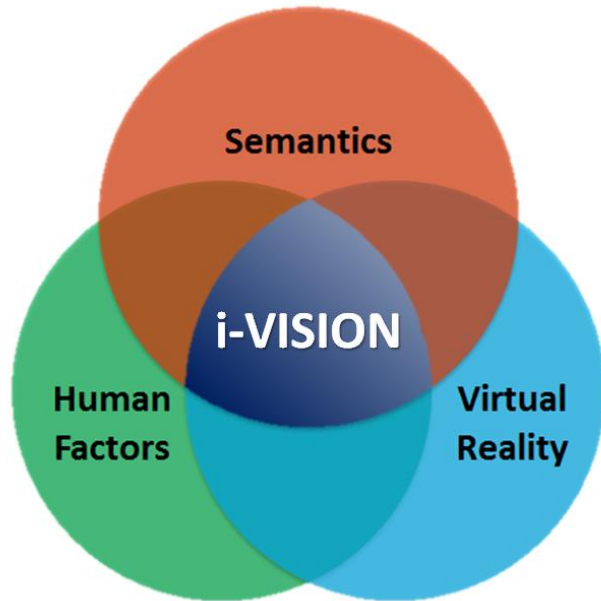


High-tech automotive headaches
Drivers find infotainment systems complicated and trouble-prone

Published: December 2013

New Flight Deck Evaluation





i-VISION aims at supporting **human factors design and validation** activities in aircraft cockpits during the early phases of the product life-cycle through **knowledge-based immersive virtual reality** technologies.

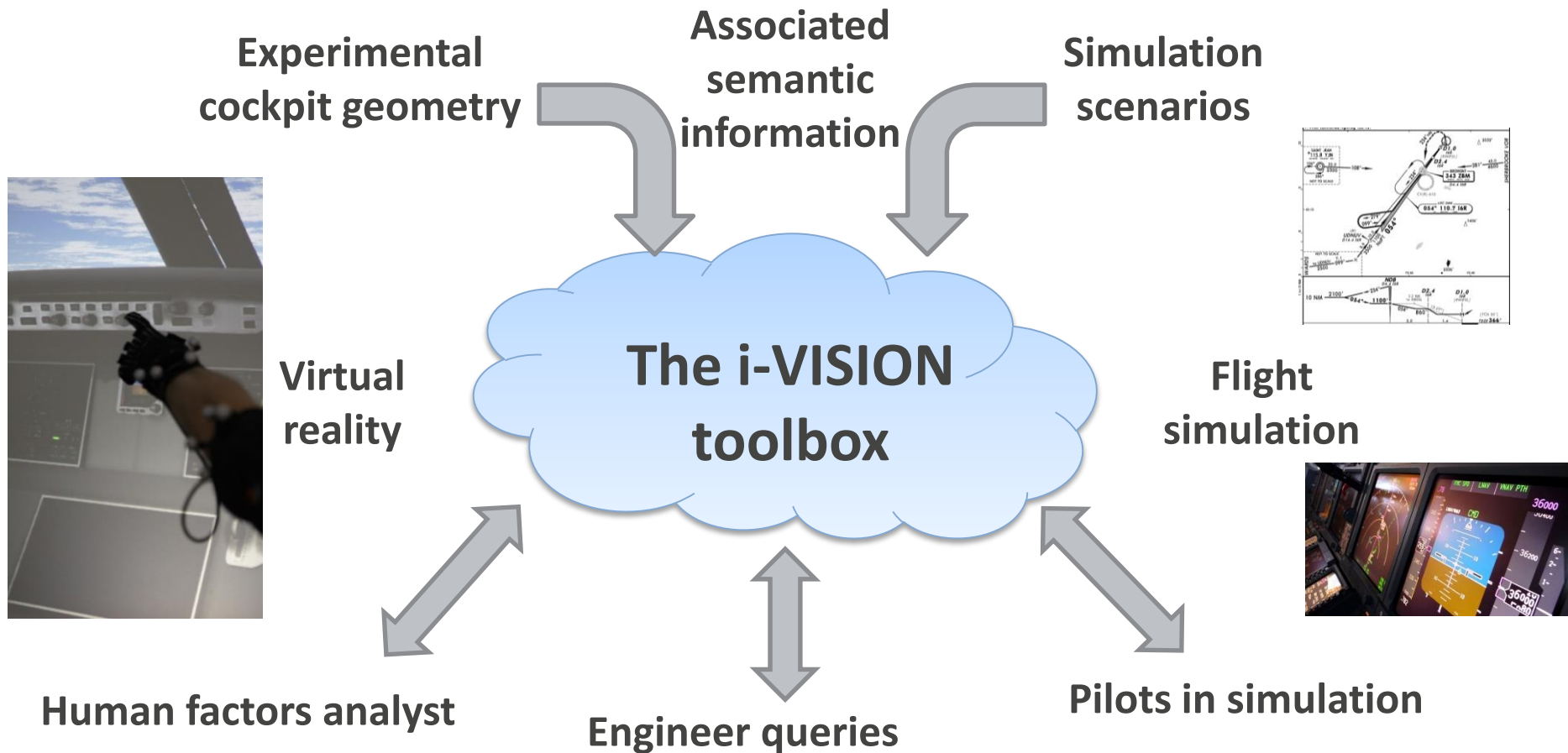
The objective is to **increase the flexibility** and **reduce the cost** of aircraft cockpit design and evaluation.

It combines **3 distinct areas** of research into a single advanced design and validation tool:

Human-Cockpit Operation Analysis

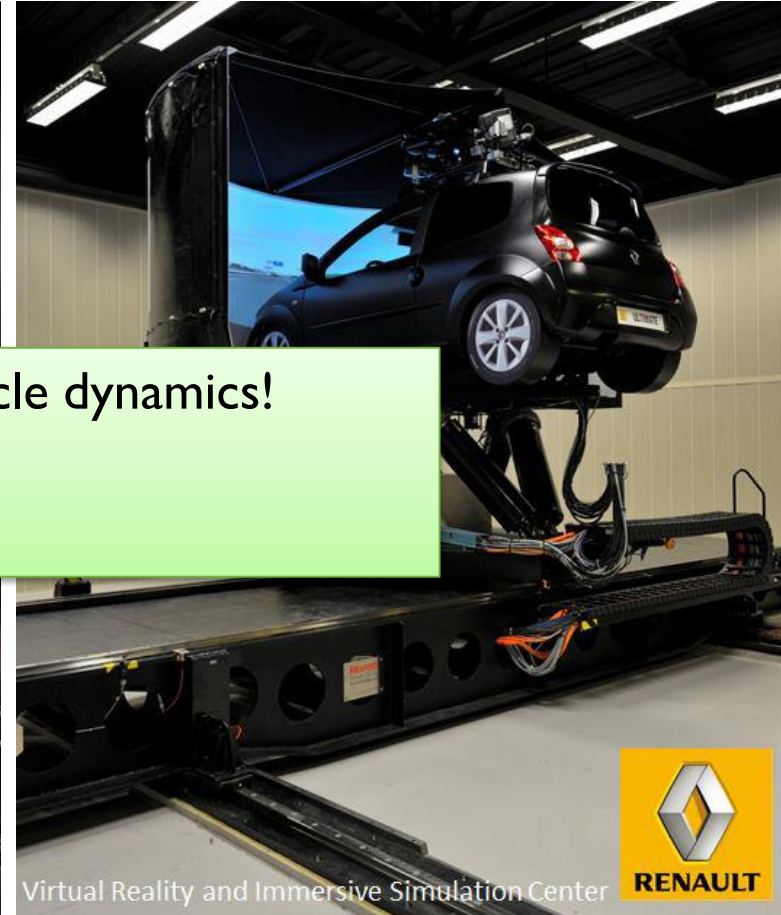
Semantic Virtual Cockpit

Virtual Cockpit Design Environment



How testing this ?





Usefull for driver performance and vehicle dynamics!

Not for new car concept.



Erwin R. Boer @ Driving Simulation Conference, Sept 15-16, 2015

Simulator utilities:

- Human performance
- Human limitations
- ADAS
- Road design
- Vehicle Dynamics
- Driver Training

Still need Driving Simulators for testing self-driving cars

To explore all new oncoming challenges early in the process development, we need:



Immersive Driving Simulators

Including:

- Immersive stereo visualisation
- Head, eye and finger trackers
- Complete multi-sensory simulation:
 - Visual with Physics-based lighting simulation
 - Sounds
 - Motion cues

Immersive evaluation of ambient lighting

Dynamical assessment of interior lighting:

- Check perceive quality
- Design theme
- Place lights
- Observe light and materials interaction
- Observe spectrum change
- Measure lighting performance and behavior

In static or dynamics conditions.





Conclusion & Perspectives

New trends and challenges require virtual testing to **keep the human in the loop**.

Virtual testing using « classical » DS / VR DS / AR DS

Perspectives:

Use predictive VR with certified simulation tools

Improve Realism & Presence by integration of:

- Physics based light simulation
- Acoustics simulation
- Multi-sensory / Human perception models
- Understanding of simulator sickness

Improve simulation software:

- More interoperability
- More standards
- Scenario & AI
- 3D Maps
- ADAS/Sensors

+ Price reduction for hardware... **will spread VR into the industry!**



OPTIS Virtual Platform provide solutions to assist you in each development phases: From User Experience study, through Engineering design to Manufacturing and maintenance operations, **keeping human factors in the loop** all along the development process

OPTIS → Global presence, Local understanding



FOLLOW US

<http://www.optis-world.com/>



THANK YOU