High performance driving simulator design for a new research center

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INTRODUCTION

- New simulation building in BMW GROUP’s R&D centre
- Setting a new world reference in the field of simulation
- New driving techniques and systems → new functions in the simulation
Extreme performances

- Main focus points:
  - User experience
    - Drivers
    - Experiment manager
    - Simulator’s operator
  - Performance as a tool for R&D
    - Optimized manoeuvres and procedures for efficiency of everyday use
    - Automatic performance measurement included
  - Reliability
  - Maintenance
    - New procedures and tools
  - Flexibility for upgrades
    - Benefit of the latest technologies in the coming years
    - Be ready for the next use cases
Extreme performances – details

- Aim for an homogenous level of high performances on all functions
- Motion system of the latest generation
- Visual system:
  - more than ten LED 120Hz projectors for 360° with a very fine rendering
  - 3D compliant
- Sound system: flexible matrix system
- Exchangeable mockups:
  - Full equipped mockups delivered
  - Motorized exchange system
  - Compliant with RHD and LHD mockups
- High grade simulation control system
  - Centralized management of the simulators,
  - Safety system included
New challenges

- Conjunction of high performances → less off-the-shelf components available on the market
  - Ex: projectors, cable management systems …
  - Bench testing the latest generations of components
  - Weight optimization on all components

- Not one but two simulators in the same building!

- Design of the domes
  - Carbon structure, 7m inner diameter
  - Holds the projection system
  - Optimized shape for the visual field of view
  - Doors for the passengers & the mockups
  - Safety hatches in the floor
  - A/C included

- Flexibility for future upgrades

- Certification of the whole simulators