HPC physics simulation at the heart of industry

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Jacques Delacour | OPTIS Founder & CEO
27 Years of Innovation

1989

Optics

Physics-based rendering

Virtual reality

Sound

2016

CAD integration

Human vision

Real time simulators
A Unique Combination of Know-how

- Optics
- Virtual Reality
- Acoustics
- Computing
- Simulators
- Perceived Quality

Jacques Delacour
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PHYSICS SIMULATION
What is the result I get if I do that in this situation?

Simulation is necessary to replace real prototypes and experiences.
Why performing numerical simulations?
Optical Simulation
Optical systems…

Defense

Science

Consumer goods

Lighting
How does it work?
WHAT FOR ?
Making your dream real

From **30 days** with real prototype to **4 days** with SPEOS

From **4 days** to **30 min** with SPEOS HPC (**8 640 cores**)
Significant time savings on lighting simulation

From 10 days to 4 h with SPEOS HPC
(57 600 core.h)
In Complex projects: ITER

From 24 hours to 1 mn with SPEOS HPC (8 640 cores)

Joint European Torus (UKAEA)

Full metallic environment

Cosmetic & skincare simulation on skin

Simulation time: 5H50
Reduced to 16 mn
Cosmetic & skincare simulation on skin
An example: At Bentley Motors

Simulated by OPTIS with the courtesy of Bentley Motors
Gain in Quality & Productivity

- **ACTUAL gain**
  - Extended Virtual + 2 Physical Prototype
  - **USD 0.28 million**

- **FORECASTED**
  - Virtual with 4 Physical Prototypes

- **FROM 12 PHYSICAL PROTO**
  - + **USD 2.10 million**

**GLOBAL MULSANNE DEVELOPMENT =**

- **6 MONTHS SHORTER :**
  - **1.82 Million USD saved**

**HOW MANY MORE CARS SOLD?**
IMPACTS AND PROSPECTS
Simulation has many advantages in industrial areas

- Time
- Ecology
- Energy
- Cost
- Performances
Towards a new paradigm

From 1 prototype a week….

...To 1 prototype an hour
Simulation in the loop: where virtual helps real
Fast simulation allows multi-physics

Mechanics → Dynamics → Fluid → Thermal → Optics
Fast simulation allows multi-physics

Mechanics ➔ Dynamics ➔ Fluid ➔ Thermal ➔ Optics
From products to complex autonomous systems
Living real life virtually

wouldn't it be better if we focused on making people smarter?
CONCLUSION
What happened in 130 years?
What happened in 130 years?
What will happen in the next century?
And in other industries?

AUTOMOTIVE

AEROSPACE

HI-TECH

WHITE GOODS

MEDICAL

LUXURY

ENERGY

ARCHITECTURE

LIGHTING

RESEARCH

AUTOMATION
Simulation is the new key to efficiency

Time
Cost
Exploration
MERCI