

**Renault  
Group**

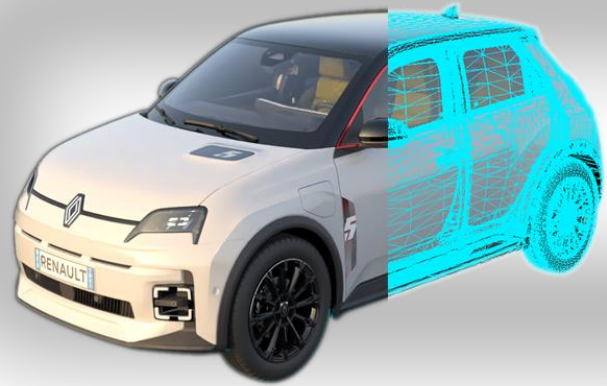
# Automotive Lighting Challenges: From Collaborative Design to Predictive Simulation

BENOIT DESCHAMPS

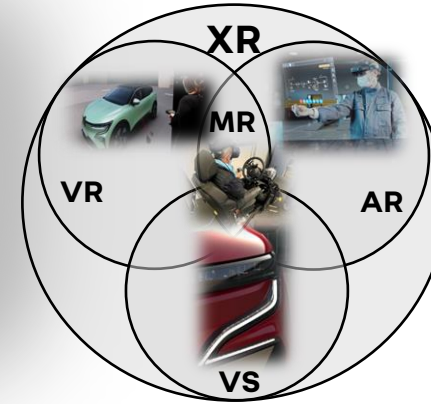


# Visualization MockUp & eXtended Reality

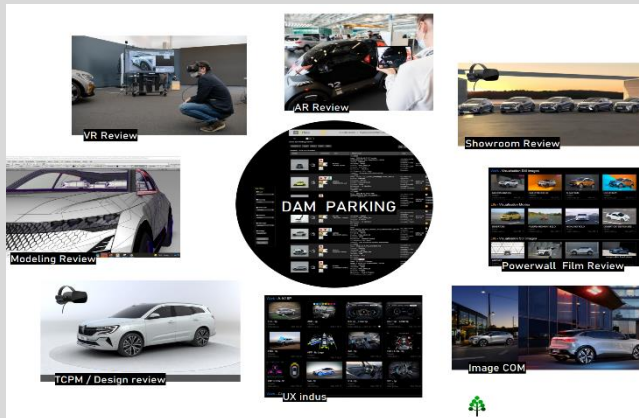
RG



&



## Design



## Engineering

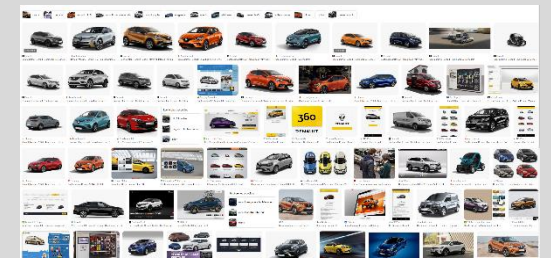
### Product



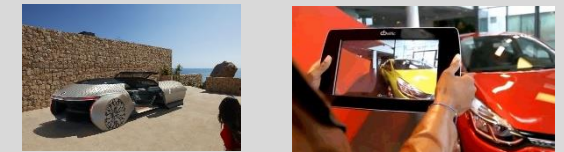
### Process



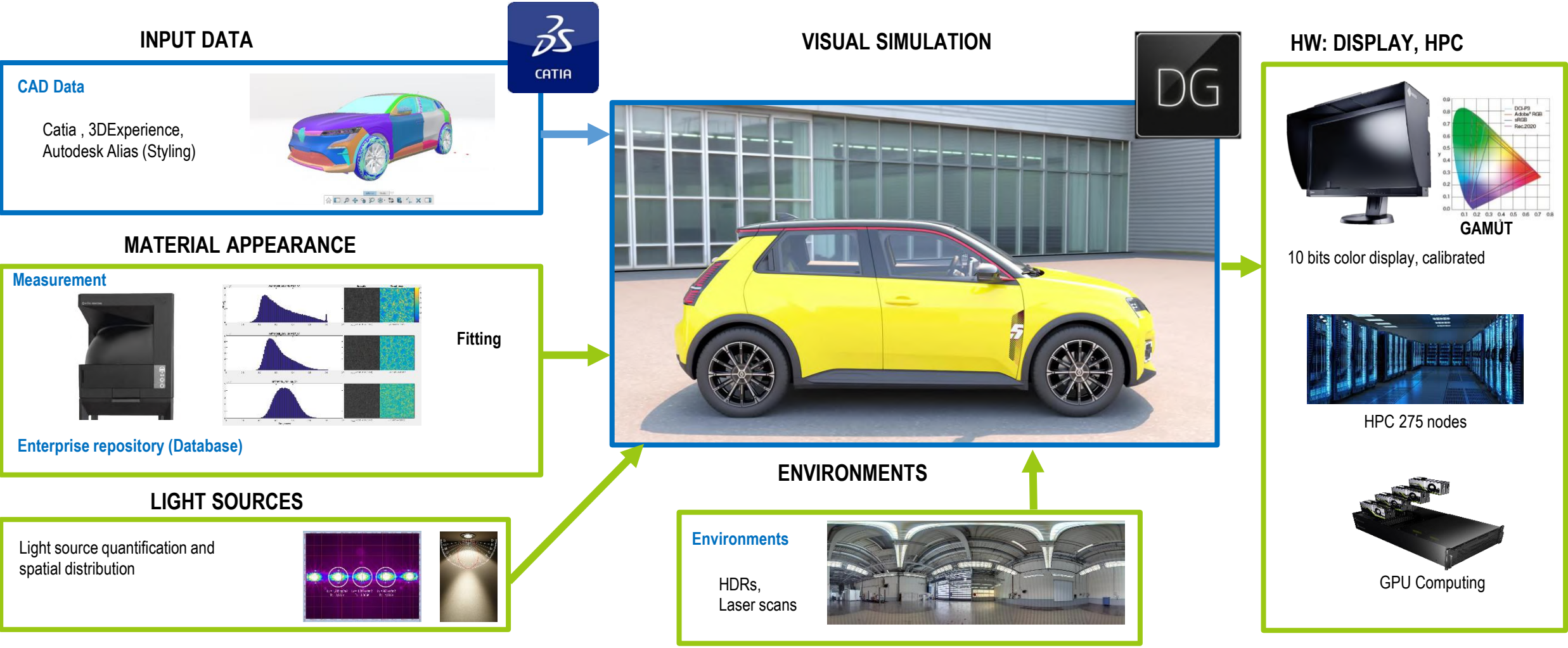
## Marketing, After Sales,...



### External agencies



# Tools, Methodologies and R&D



# Specific methods and tools for lighting

## OBJECTIVE APPROACH



*Homogeneity analysis from luminance views*



*Leak of light zoning and intensity from illuminance views*



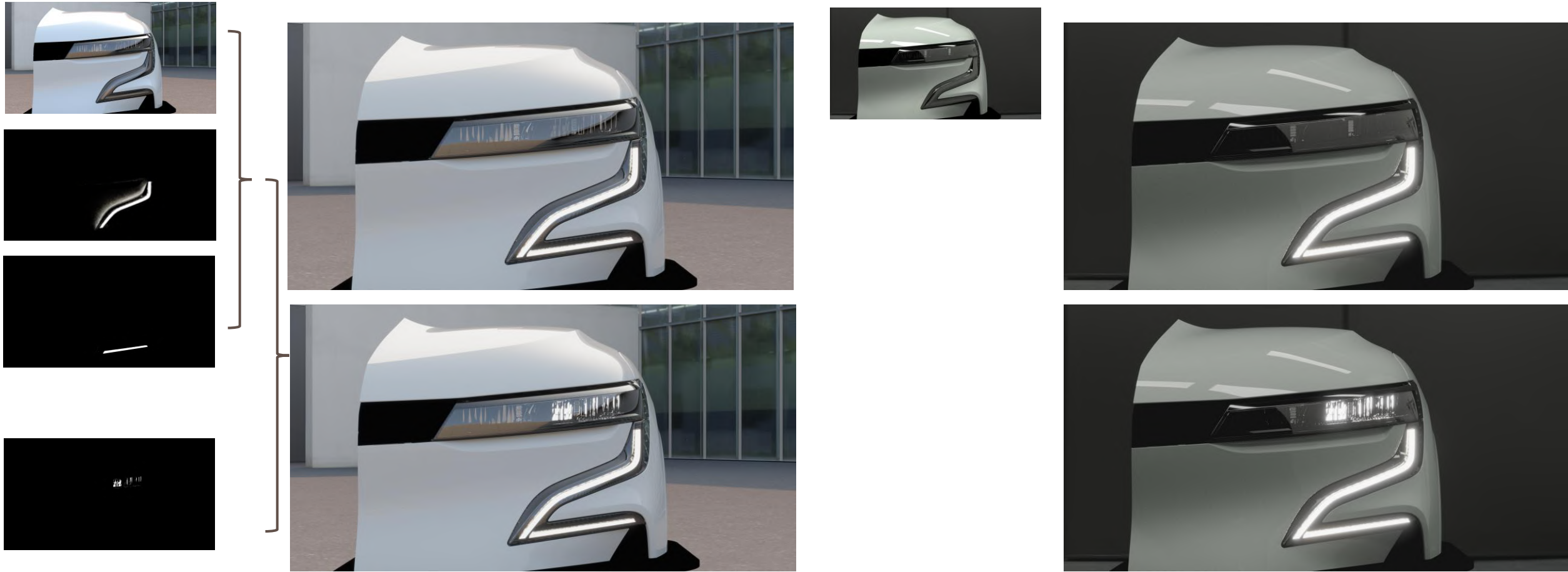
*Contribution analysis by lighting system using raw visualization*

*Contribution analysis under different lighting conditions to detect daylight artifacts*

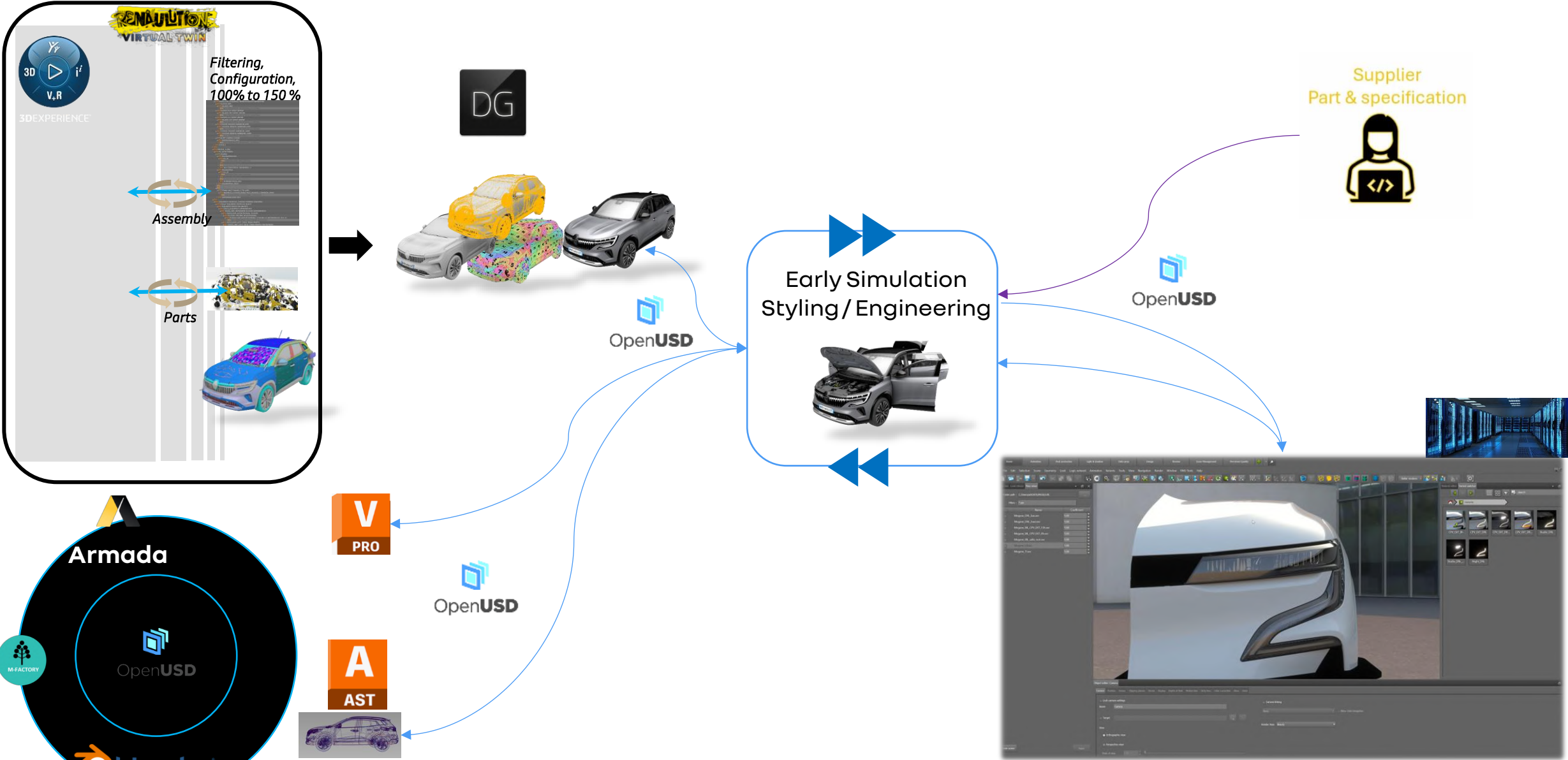
# Optimization by Light Path Expressions

## MOVING TO AN EFFICIENT WAY TO MANAGE PRODUCTION

- “Unlimited” external lighting condition capability.
- Luminance adaptation possible in post-production.
- Adaptive sampling quality for IBL lighting and individual technical components



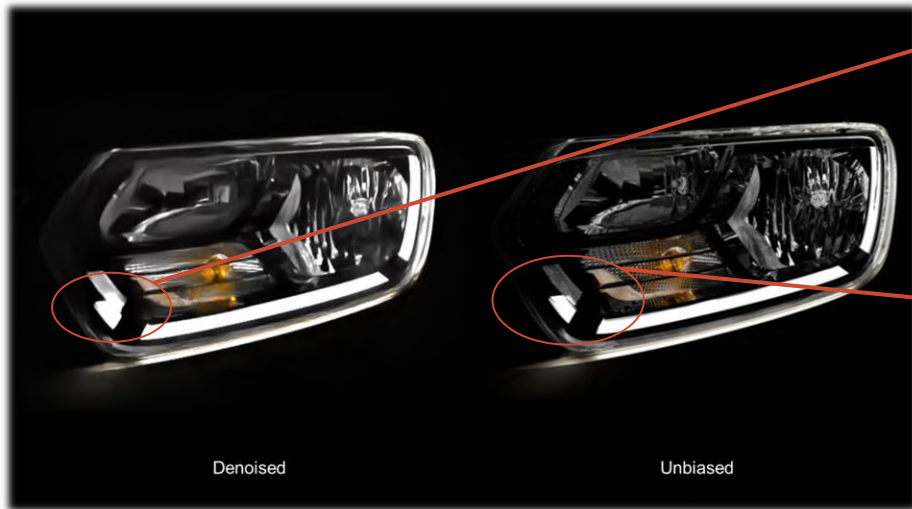
# Next challenges: Collaborative Design



# Next challenges : reducing leadtime with AI while preserving accuracy

## VISUAL SIMULATION VS BEAUTY SHOT

- State of the art techniques enable realtime ray tracing using AI denoising.
- Excellent for beauty shots but how do we guarantee accuracy ?



Denoised



Unbiased

# Next challenges for functional simulation

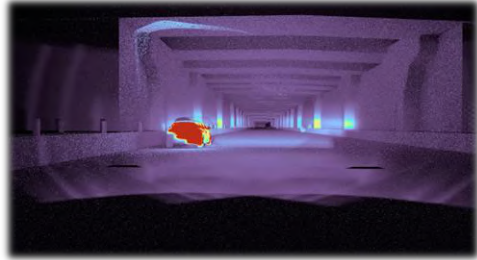
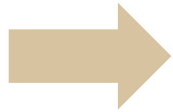
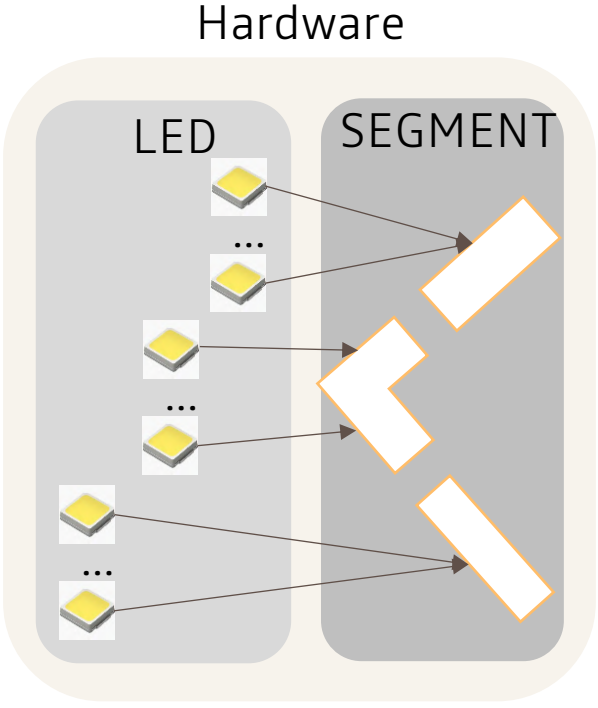
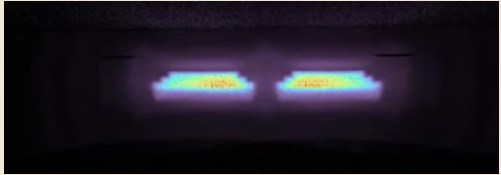

UX Design

DIL , environment



Software & logic

Functions to activate elements



Intelligent Lighting



Design animations & transitions



Welcome sequences / ambient lighting

# Thank YOU

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