# COMPUTER GRAPHICS GROUP

**THE COMPUTER GRAPHICS GROUP AT AALBORG UNIVERSITY**
DEPARTMENT OF ARCHITECTURE, DESIGN AND MEDIA TECHNOLOGY
TECHNICAL FACULTY OF IT AND DESIGN

Designing Augmented and Virtual Reality experience and interaction. The research also involves modeling and estimating the interaction between light and surfaces, applicable to surface inspection.

## RESEARCH

### KEY RESEARCH AREAS

The research group focuses on collaboration driven research in Augmented and Virtual Reality.
We aim at:

- pushing the boundaries of the enabling technologies
- contributing to the understanding of how to optimally apply the technologies in terms of sensing, perception, and usability

### WHAT WE DO

We address the challenges of balancing limited computing resources with the need for obtaining convincing and usable Augmented and Virtual Reality experiences, while taking into account, that the systems need to operate in real-time.
The results are applicable to designing perceptually optimal Augmented and Virtual Reality experiences, and interaction in such experiences.
The research also involves modeling and estimating the interaction between light and surfaces, applicable to surface inspection.

## EDUCATION

### STUDY RELATED ACTIVITIES

The group teaches aspects of Computer Graphics programming, rendering, visualization and Computer Vision in various B.Sc. and M.Sc. programmes.

## COLLABORATION

### WHO BENEFITS FROM OUR RESEARCH

Our research is interesting for developers and users of Augmented and Virtual Reality experiences.

### EXTERNAL PARTNERS

Unity Studios
Grundfos
Aalborg University Hospital
PowerCurve
Aalborg Kommune
North Denmark Transportation Authority
Kanda
No Parking Productions
Vattenfall
Vesthimmerlands Museum

## PUBLICATIONS

### IMPORTANT PUBLICATIONS

- Handheld visual representation of a castle chapel ruin
- Perceptual Evaluation of Photo-Realism in Real-Time 3D Augmented Reality
- Estimating Outdoor Illumination Conditions Based on Detection of Dynamic Shadows
- Player Experience in a VR and Non-VR Multiplayer Game
- Self-overlapping Maze and Map Design for Asymmetric Collaboration in Room-Scale Virtual Reality for Public Spaces

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## KEY PROJECTS

### THE LER PROJECT

The LER project developed techniques for submilimeter 3D scanning of wind turbine blades and estimation of surface roughness due to erosion.

### THE DARWIN PROJECT

The DARWIN project develops techniques for estimating illumination and surface reflectance for indoor and outdoor applications.

### ROBOT SURGERY TRAINING

In collaboration with Aalborg University Hospital and MIUC, we developed virtual-reality and augmented-reality tools for training in robot-assisted minimally invasive surgery.

### VR AND AR FOR MUSEUMS

In collaboration with Vesthimmerlands Museum we are developing virtual-reality and indirect-augmented-reality experiences for intangible cultural heritage.

## VIDEO PRESENTATION

## CONTACT


### RESEARCH GROUP HEAD

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