Gesture-based manipulation for collaborative computer-aided architectural design in virtual reality

Adrien COPPENS
Software Engineering Lab

Faculté d'Architecture et d'Urbanisme
Faculté des Sciences
UMONS Université de Mons

May 12 2018 @ CAMPaM, Bellairs Research Institute (BB)

Terminology

Mixed reality (MR)

Real world — Virtual world

Augmented reality (AR)

Spatial AR

See-through AR

Augmented virtuality (AV)

Virtual reality (VR)

Context: architectural design

Paper drawings & scale models

2D/3D modelling (WIMP interfaces)

AR/VR visualisation

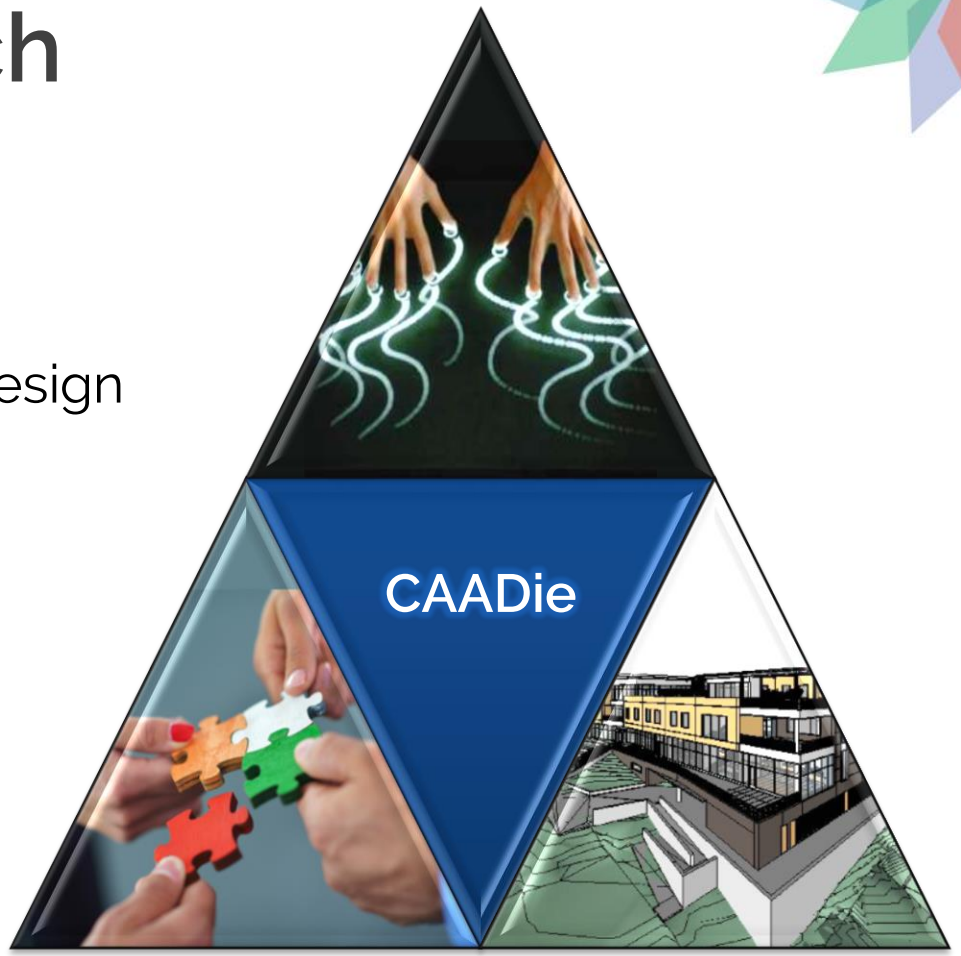
AR/VR modelling

Goals of the research

CAADie

Computer-**A**ided **A**rchitectural **D**esign within **i**mmersive **e**nvironments

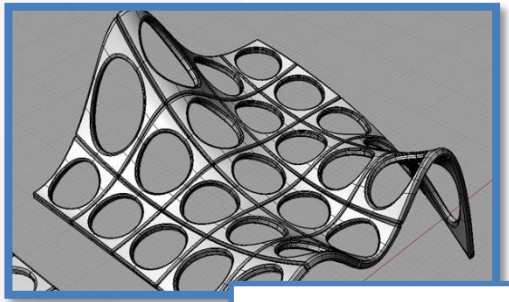
- Gestural interaction
- Collaborative work

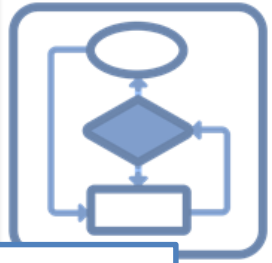


CAADie

Sketching

Gestural interaction



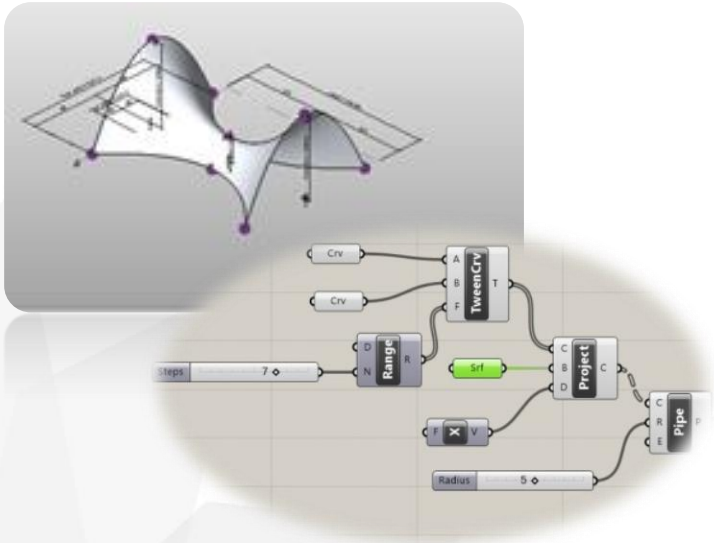


Advanced modelling

Live collaboration

First steps in architectural modelling in VR

Modifying parametric models in VR (parameter values)



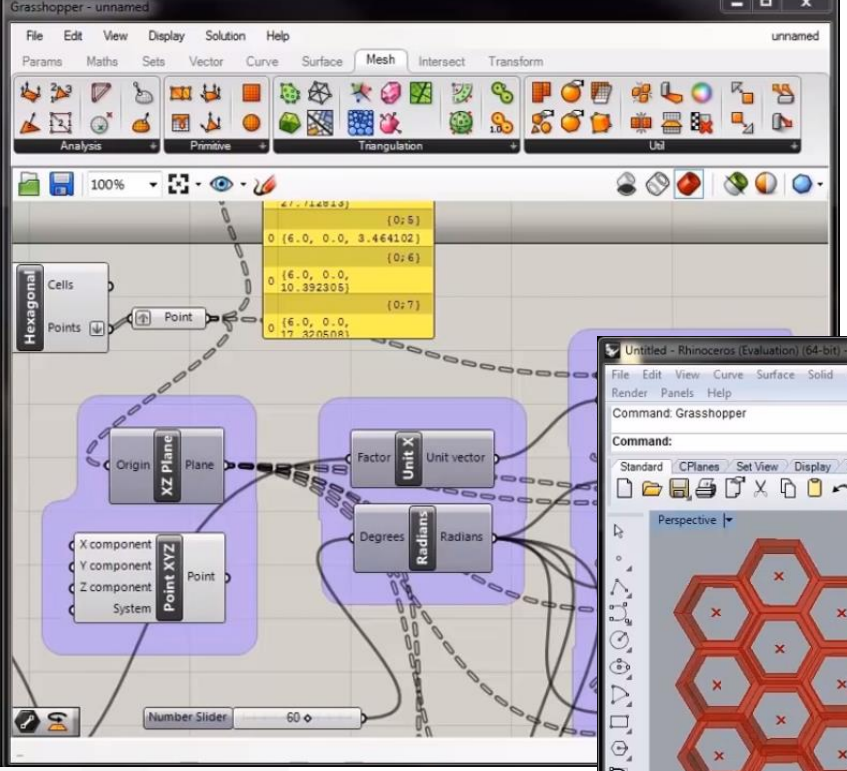
mesh streaming

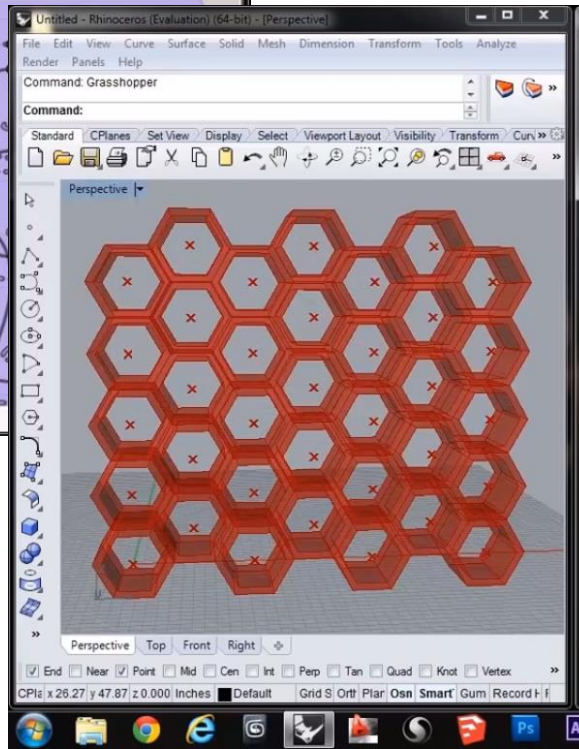
parameters

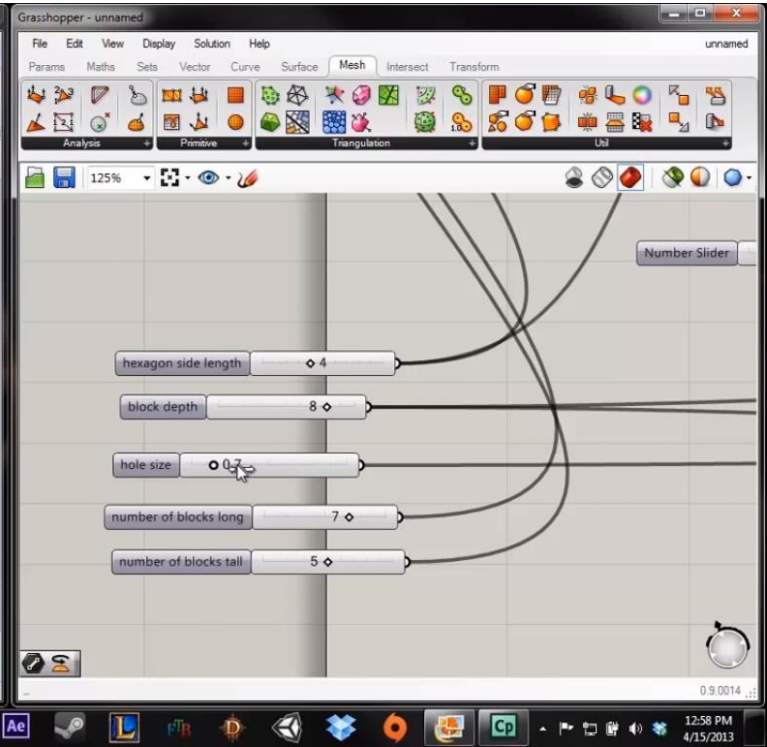
values

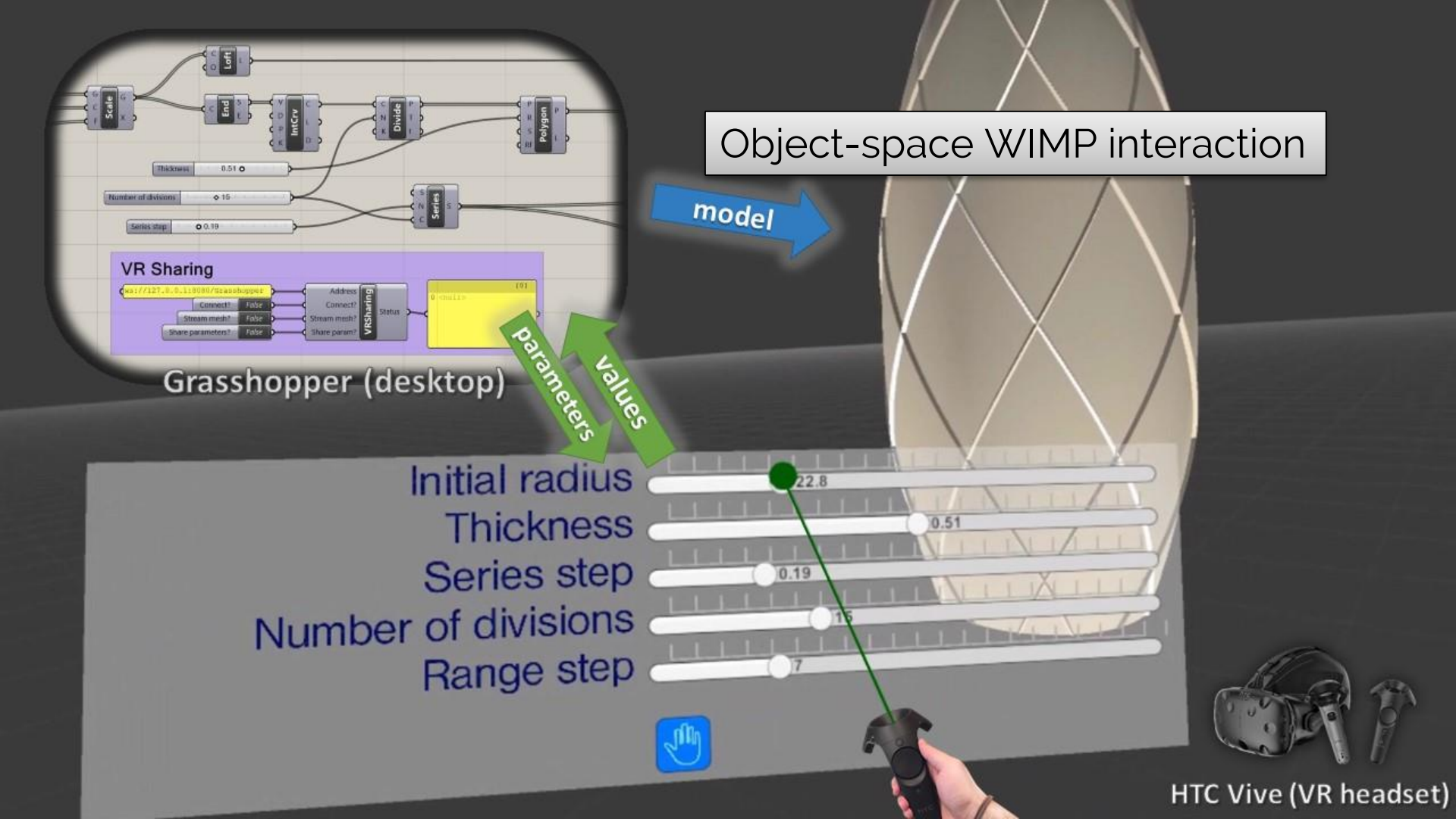
Demo (GH-VR bridge)

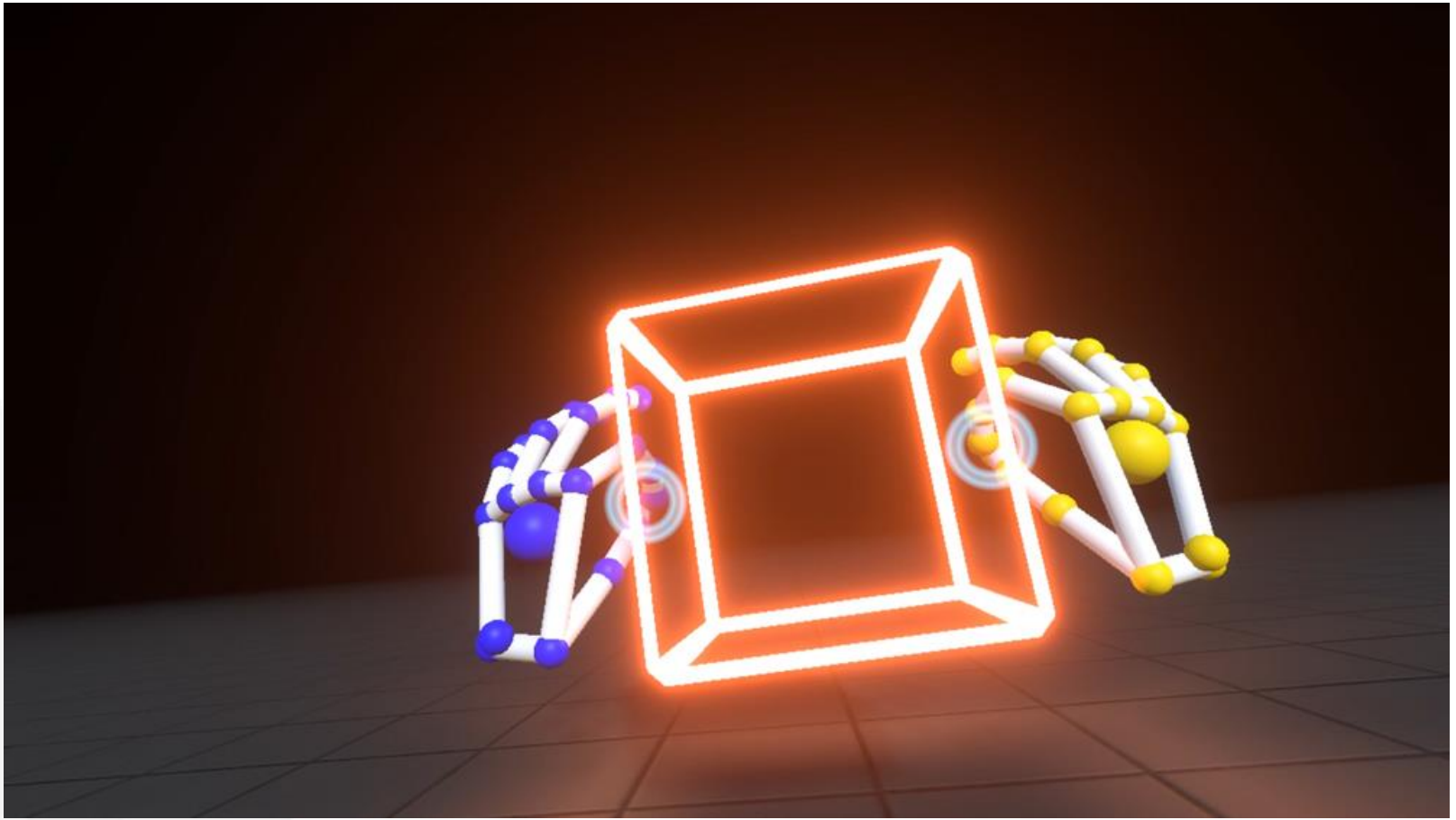
Screen-space WIMP interaction








Object-space WIMP interaction
model
parameters
values
Grasshopper (desktop)
VR Sharing
Initial radius
Thickness
Series step
Number of divisions
Range step
22.8
0.51
0.19
15
7
HTC Vive (VR headset)



Towards post-WIMP interaction

Gesture-based manipulation for collaborative computer-aided architectural design in virtual reality

Adrien COPPENS

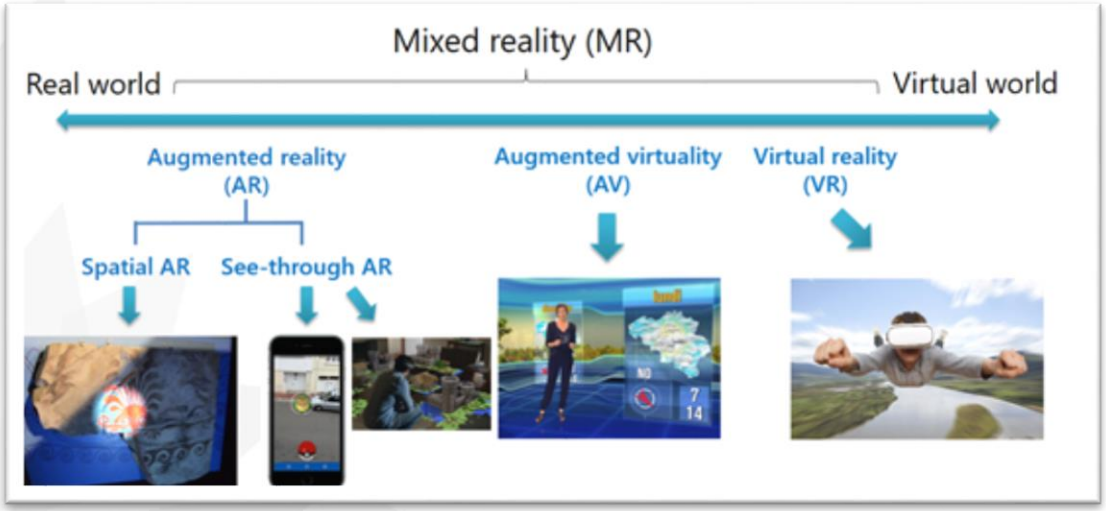
Master's thesis (arXiv:1706.08096)

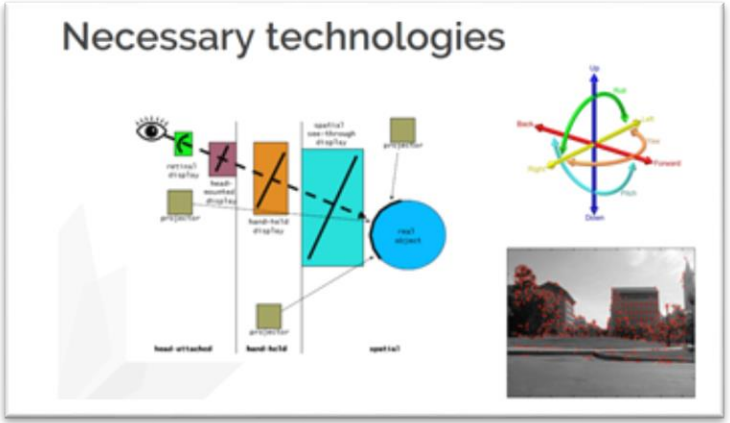
Merging real and virtual worlds:

An analysis of the state of the art and practical evaluation of Microsoft Hololens

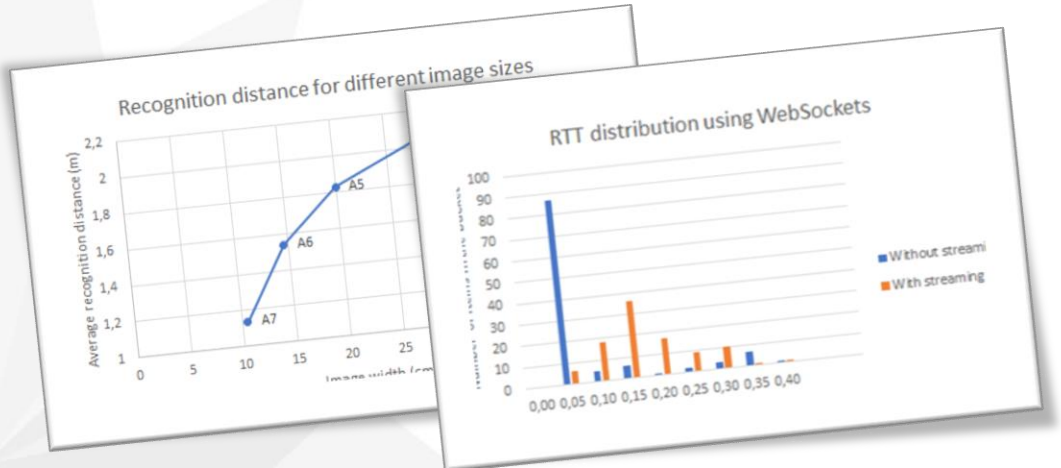
Supervisor: Prof. Tom MENS

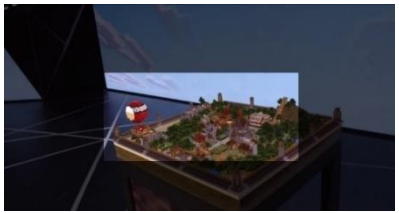
Reviewers: Prof. Thierry DUTOIT // Gauvain DEVILLEZ





Master's thesis





Limitations

Prospects


vuforia™

Demo (HoloEscape)