






# Visualization of multispectral images in a virtual room





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22 June, 2016





# Objective

-  Digitize the room
-  Navigate in the virtual room
-  Add virtual reality multispectral pictures
-  Different perception of the RGB details
-  Enhancement of detail and color

# Cases where we can use this project




-  virtual tour of a museum
-  Preview renovation of a hotel or palace
-  Configuration history of a building before work or change
-  Simulation of a layout of a room in high quality rendering

# State of the art

-  Microsoft - HoloLens
-  Google - project Tango
-  Sony - 3D holographic football (for 2022)
-  Carnegie-Mellon university (Pittsburgh, Pennsylvania, United States) – Virtualizing Engine



# Needs

-  Project tango device
-  Camera multispectral
-  Gaming engine



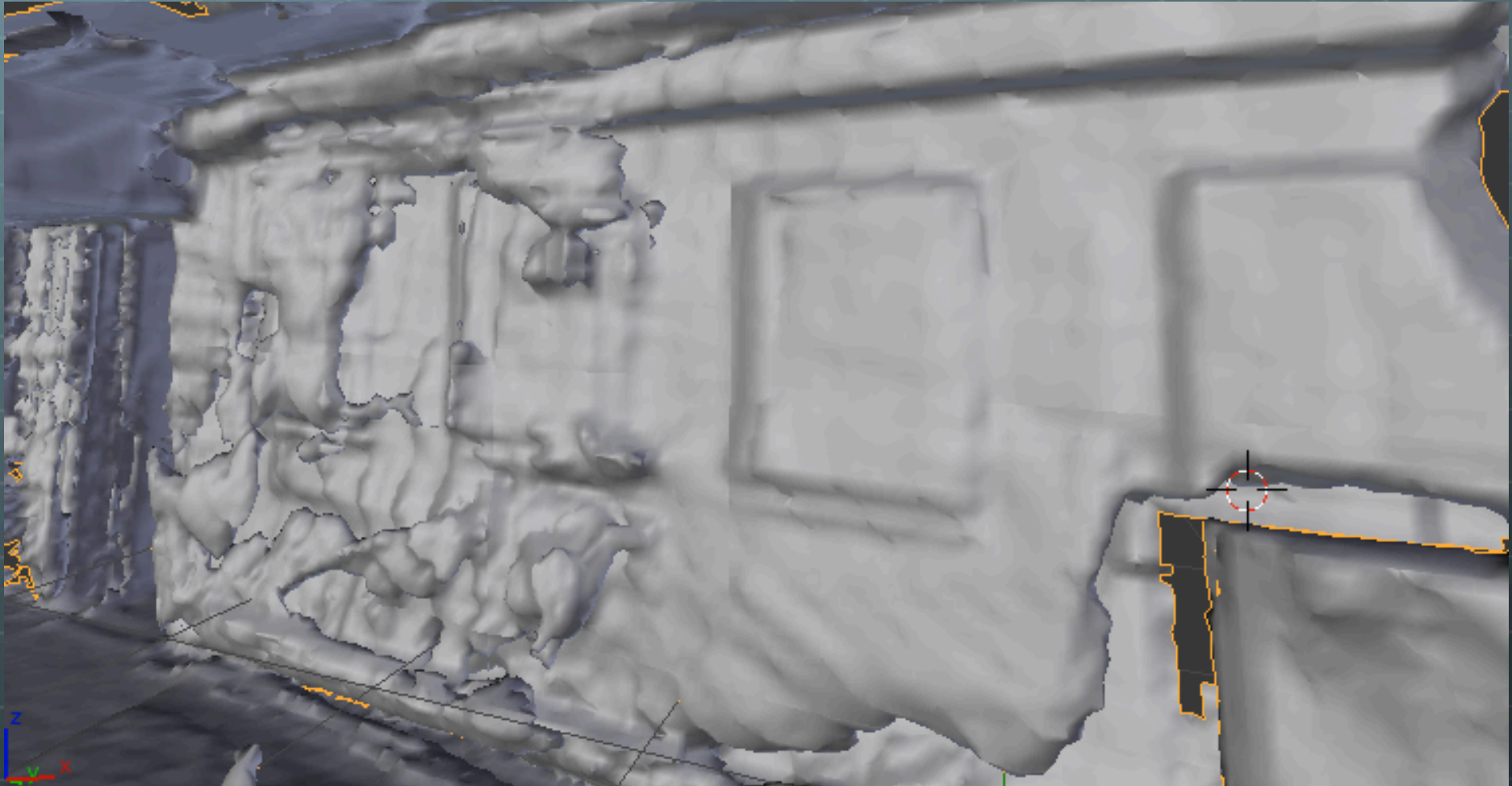
# Acquisition

(for 3D construction)

- Why tablet project Tango?
  - Odometry + stereovision infrared
- Constructor (by Google)
  - Export file .ply or .obj
- Quality for digitilize

# Building

## Quality of the model





# Building

## Weight of mesh

Original (before optimize): ~20MB

After optimize: less 500KB  
(2 facets)

This have a consequence to a final produce

# Building

(Optimise the mesh)



**Graham scan**



**Delaunay triangulation**



Source: wikipedia.org

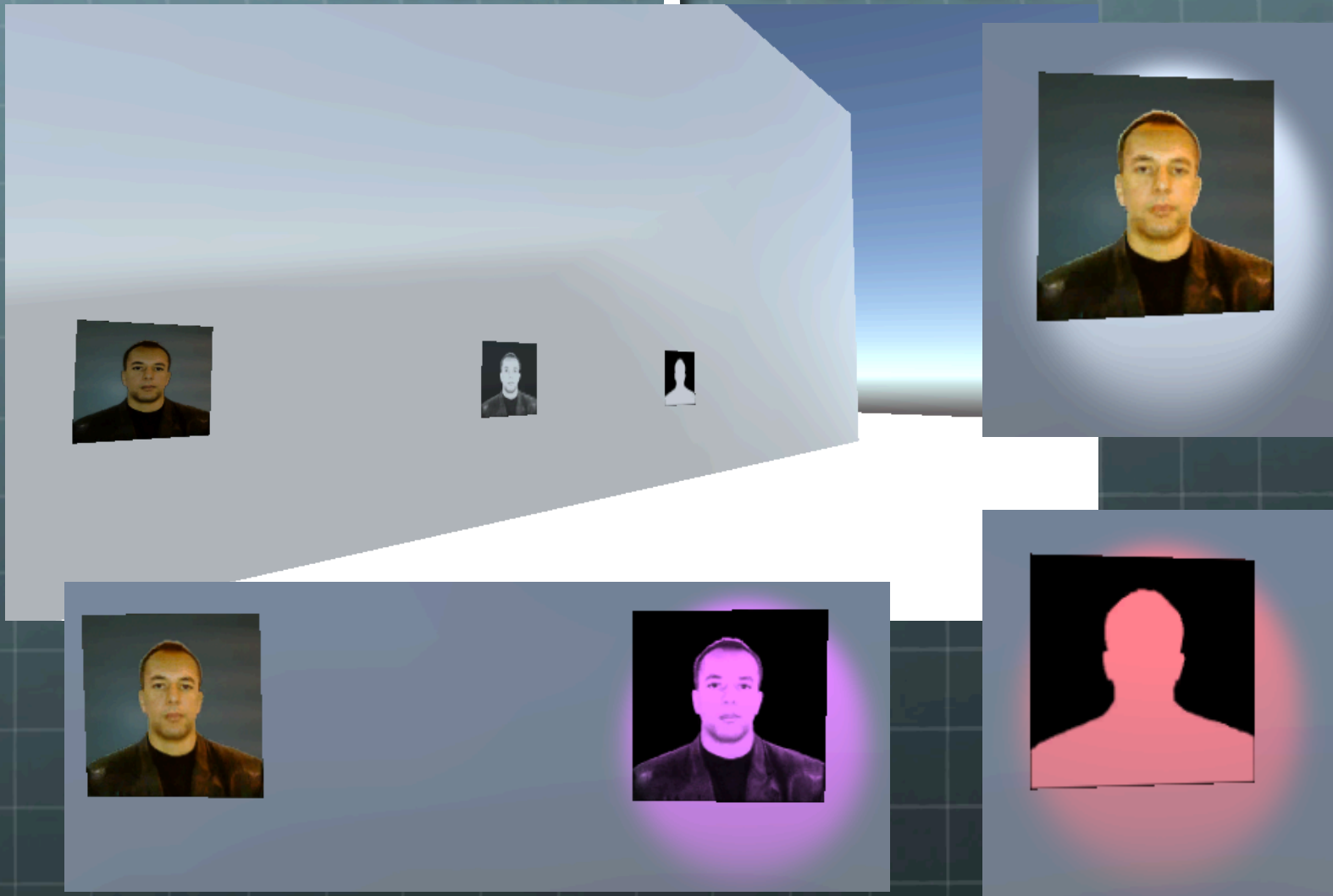
# Navigation

(Gaming Engine)



**UNREAL**  
**ENGINE**

# Multispectral





# Quantification

- More tests needed
- Now, the unique reference is Google tablet
- Possible future directions
  - Other equipments (Kinect exmple)
  - Other algorithms

# Futur direction

- 🌐 Use a library of object and replace this in the mesh for better quality, and light weight of file.
- 🌐 Solution for scan a glace, a object with reflexion, the black (or dark) color object, ...
- 🌐 Write a specifque Gaming Engine for a better rendering
- 🌐 Option for realtime manipulate a mustispectral image
- 🌐 Multispectral object (sculture, ...)

# Question?



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