

Gen-AI Seminar Series

GenAI in 3D Space

Seojin (Year 3, Architecture)

Zin (Year 2, Design+)





Conventional/
Traditional ways of
working in 3D
virtual space



Gen AI

3D modelling

- Tools introduction
 - SEGMENT ANYTHING
 - MESHY AI
- Demonstration
- Try-on session
- References

3D reconstruction

- Tools introduction
 - Luma AI
- Demonstration
- Try-on session
- References



potential applications of 3D
reconstruction in diverse fields



Utilization in filmmaking and
animation



Discussion and Q&A Session

Key Takeaways



Exploration of Generative AI in 3D modelling and reconstruction with its potential applications in diverse fields and industries



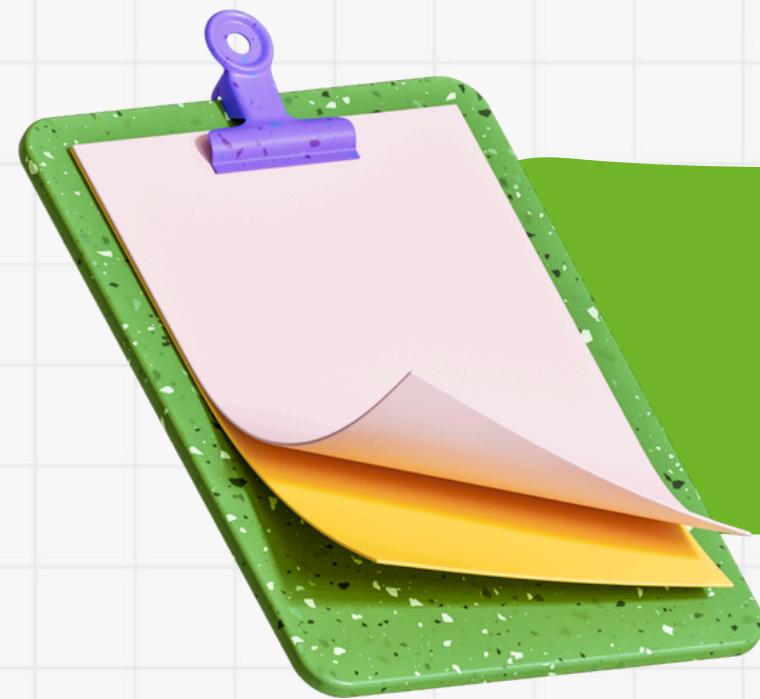
How to make use of GenAI to foster more opportunities from these emerging tools, especially for our creative pursuits?



How we used them as “an inspiring force” rather than “a mere practical tool” in the realm of creative storytelling and filmmaking



3 DIMENSIONAL SPACE



Representation and construction of
3D objects and scenes in a virtual world





CONVENTIONAL

3D modelling & reconstruction

Traditional 3D modelling

- 1 Draft the 2D plans
- 2 Figure out the Geometry
- 3 Model it in the software
- 4 Material and Textures set up
- 5 Lighting set up
- 6 Final Rendering



3D reconstruction



1

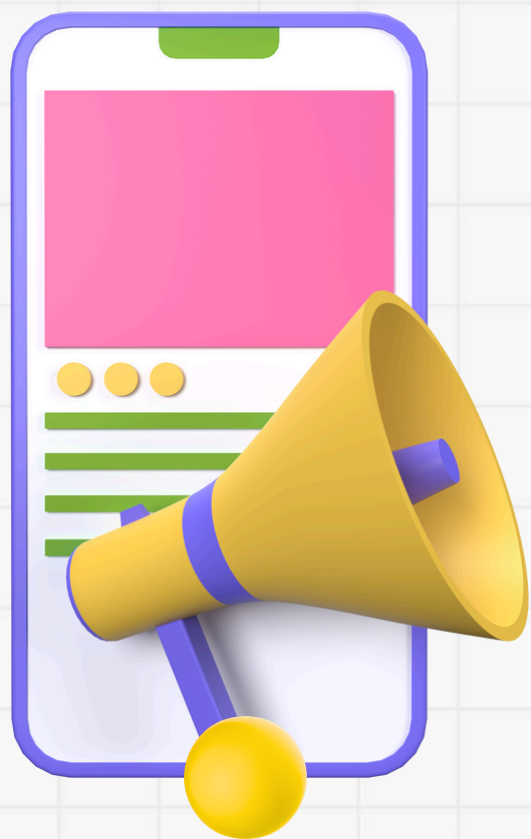
Sensor inputs
(pictures, point clouds & other data)

2

Corresponding 3D structure
automatically reconstructed

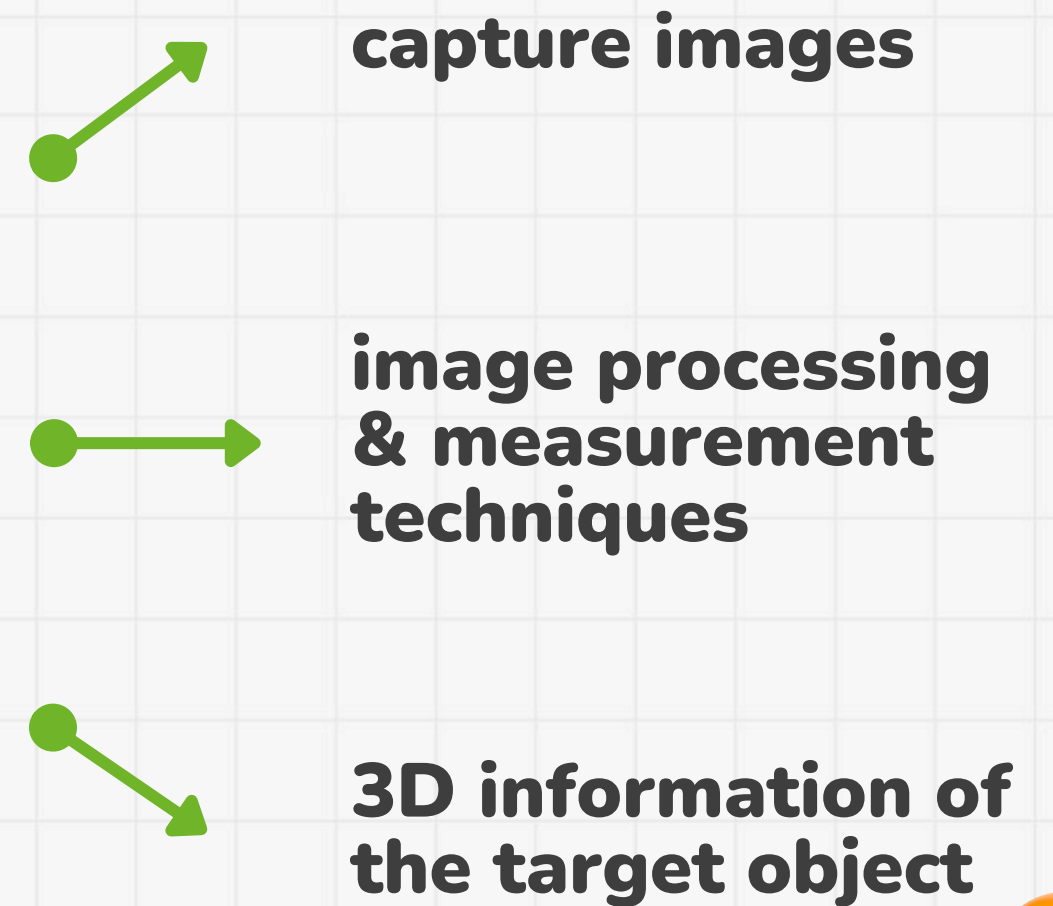


without manual labour



Traditional 3D reconstruction

“Photogrammetry”





Benefits of GenAI in 3D space

1

**Increased efficiency
due to less steps**

2

**Direct and
straight-forward**

3

**Reduced
requirements for
advanced tools and
equipments**

4

**Increased
accessibility to the
tools and techniques
to wider audience**

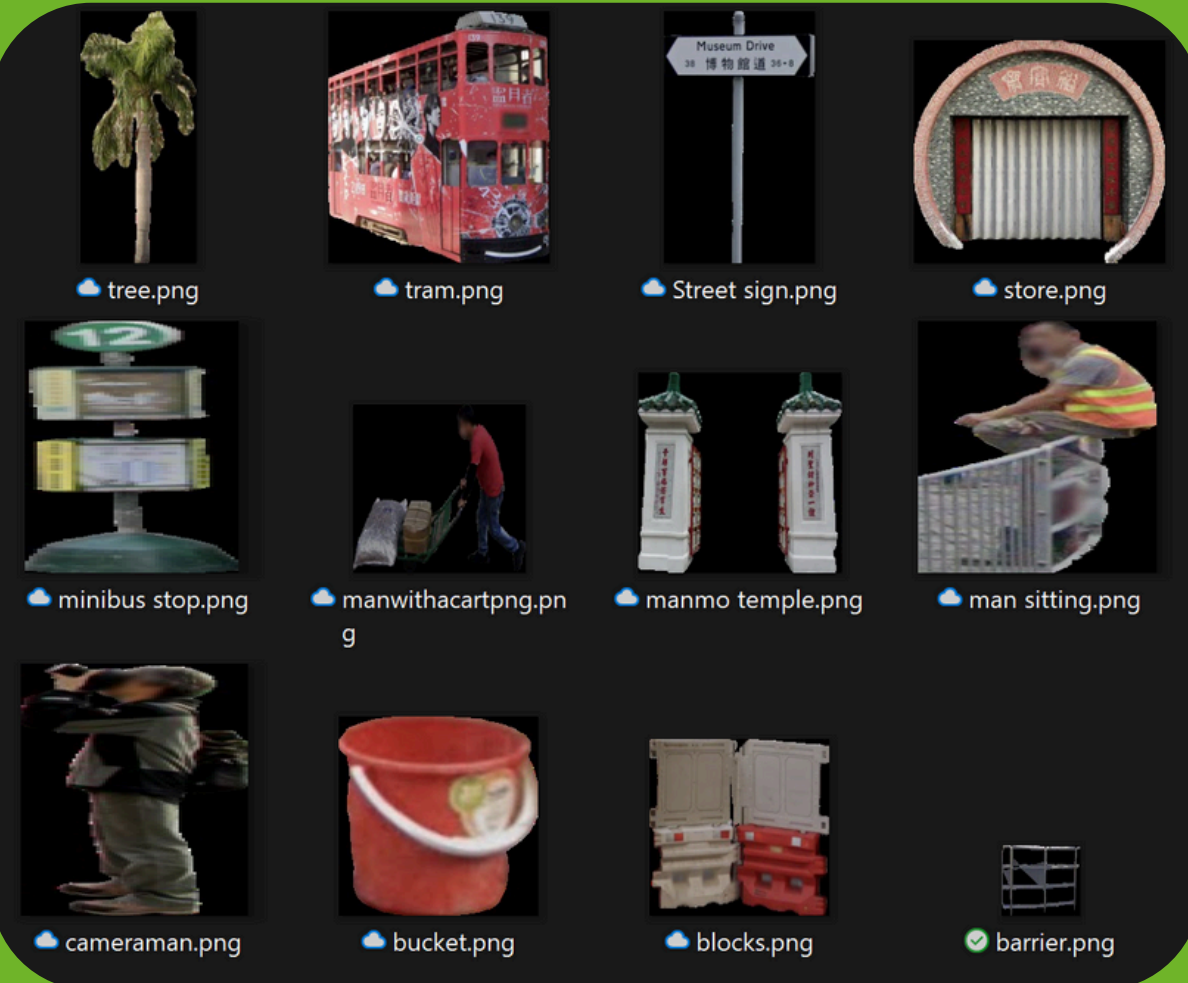


GENERATIVE AI

3D modelling

GenAI in 3D modelling

SEGMENT ANYTHING



&

MESHY AI



GenAI in 3D modelling

**SEGMENT
ANYTHING**

<https://segment-anything.com>



MESHY AI

<https://www.meshy.ai/discover>



DEMO #1



Demonstration and Try-on Session

Exercise:

1. Think of 1 object that you wanna create a 3D model.
2. Write a description as accurate as you want (style/ color/...)
 - a. Christmas Tree Vs. Yellow Christmas Tree with a globe on top
3. Generate a model
4. Generate a texture



Demonstration and Try-on Session

Exercise:

1. Choose an image (from your gallery or internet)
2. Cut-outs from Segment Anything
3. Save one of the cut-outs that you wish to produce a 3D model (as png).
4. Go to “Image to 3D” in Meshy.
5. Upload the image.
6. Generate the model.

Hong Kong's Urban Platter



Potential Applications



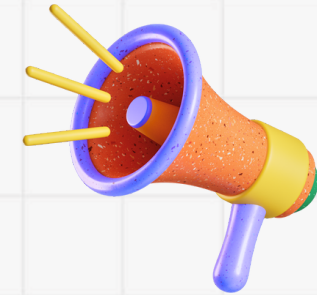
Heritage Conservation

Protecting and digital archiving historical relics and cultural heritage



Game & Movie Industry

Dynamic 3D scene reconstruction



Robotic Training

to improve navigation accuracy & safety by understanding its surrounding environment



Industrial Design

Creating precise digital models



Medical Imaging

constructing patient-specific organ models for surgical planning



Product Design

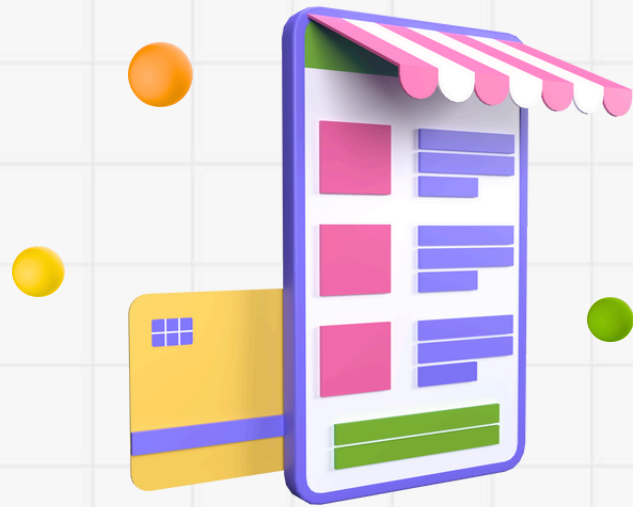
Personalized products based on user's body shape, needs or preferences



Demo test for
digital archive at
HKU Architecture
Credit:
frankanlisa



3D construction Technology



**Training extensive
computer vision
models**



**Development of
General
Artificial Intelligence**



**Increasing demand for
unmanned system,
virtual reality and
many more fields**

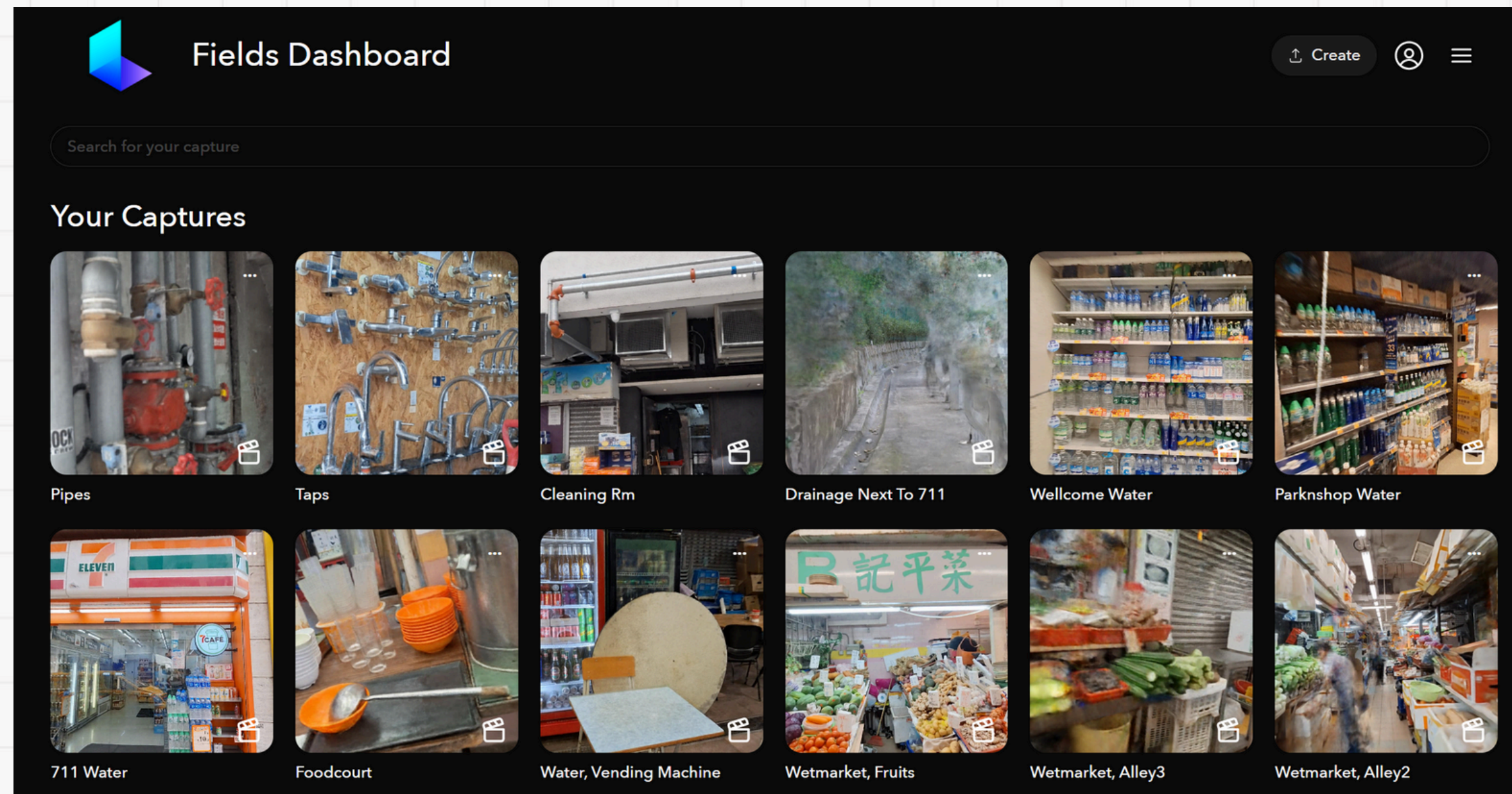


GENERATIVE AI

3D reconstruction

GenAI in 3D reconstruction

LumaAI



GenAI in 3D reconstruction

LumaAI

<https://lumalabs.ai/dashboard/captures>



DEMO #2



Demonstration and Try-on Session

Exercise:

1. Have a look around the space
2. Open your camera app and take 10-20 seconds of video.
*Tips: keep a steady camera movement, try to focus on one object or one particular space. (eg. a corner of a room, a water bottle)

Examples of good and bad scans





Demonstration and Try-on Session

Exercise:

3. Upload the video file in LumaAI
4. Wait for the result - should take about a day or two
5. You can export the them in .ply, .obj or mesh format to post process in rhino, blender, unreal engine, etc.

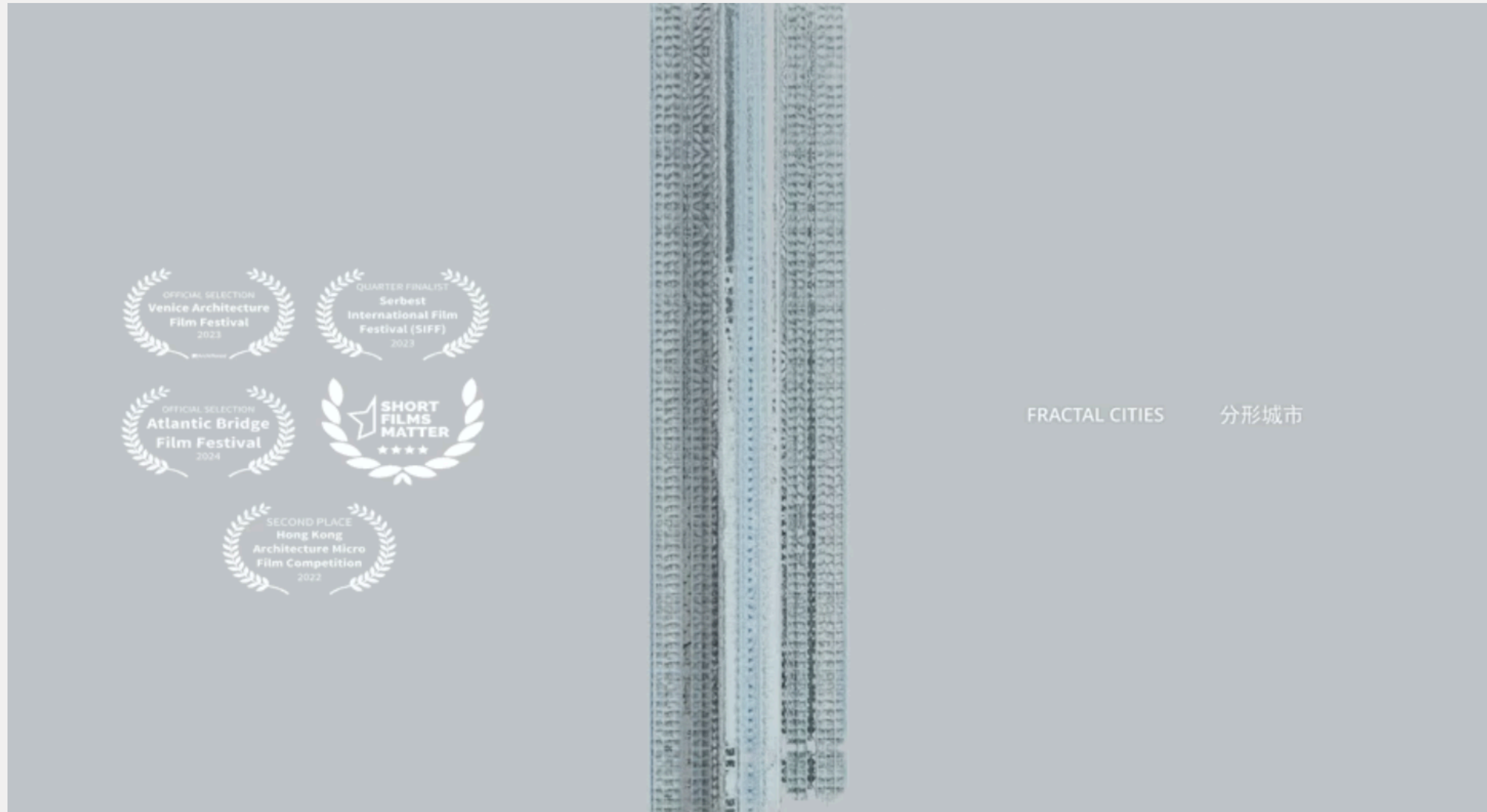


Real-life examples in
filmmaking and animation
“Moments in Motion” screening (luma AI +
blender) creative process/ workflow





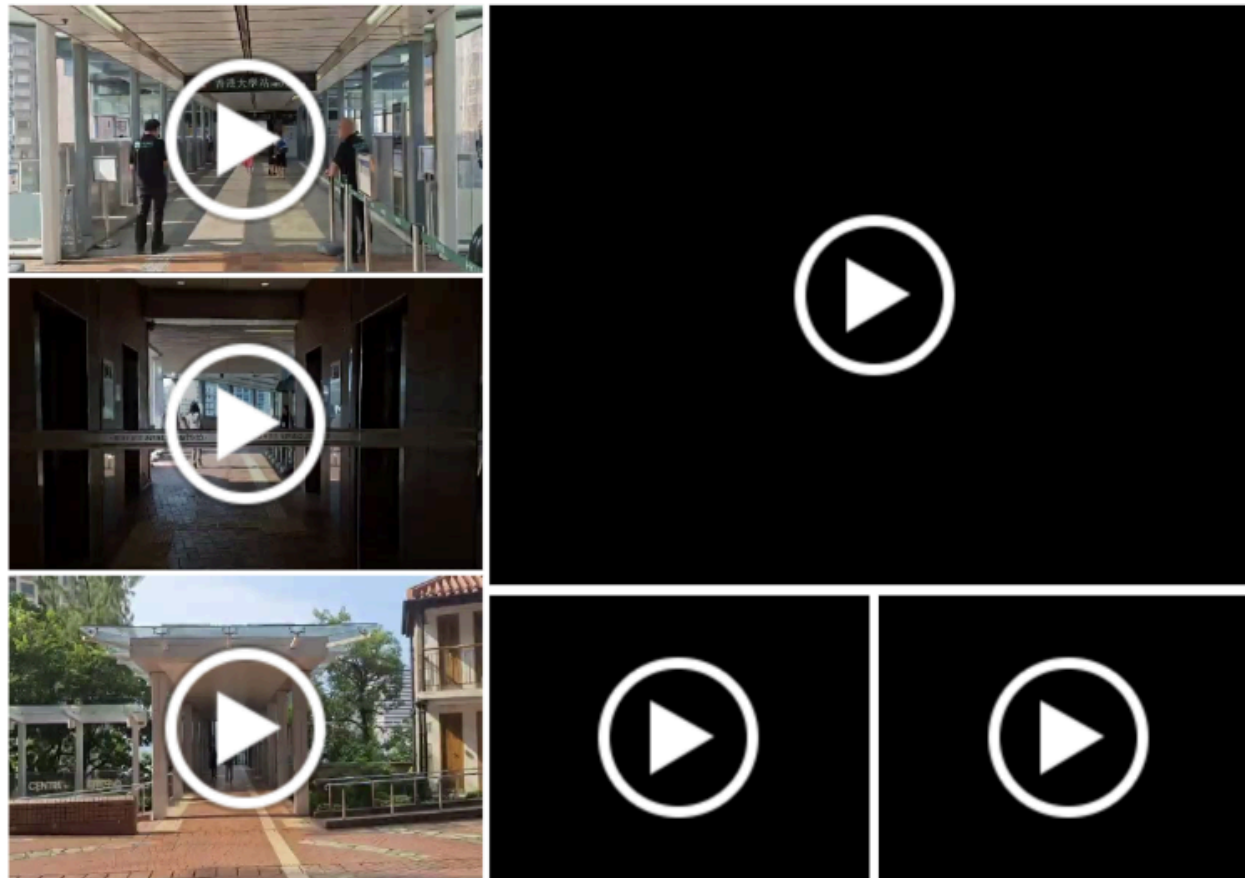
Moments in Motion by Seojin and Zin



Fractal Cities by Haotian Zhang

WORKFLOW

Video footages screenshots and LumaAI scans

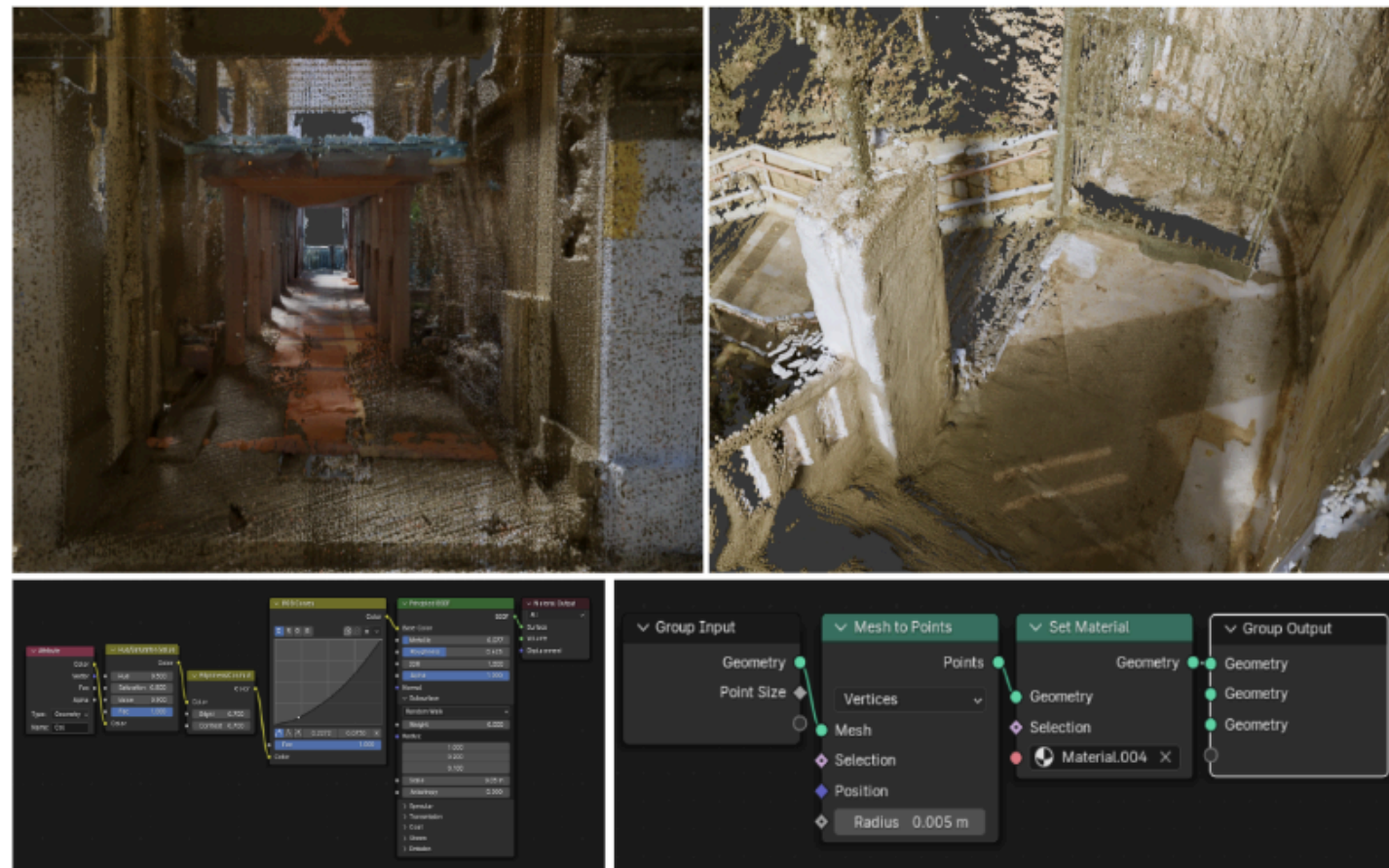


Rhino point clouds trimming, Blender point cloud manipulation

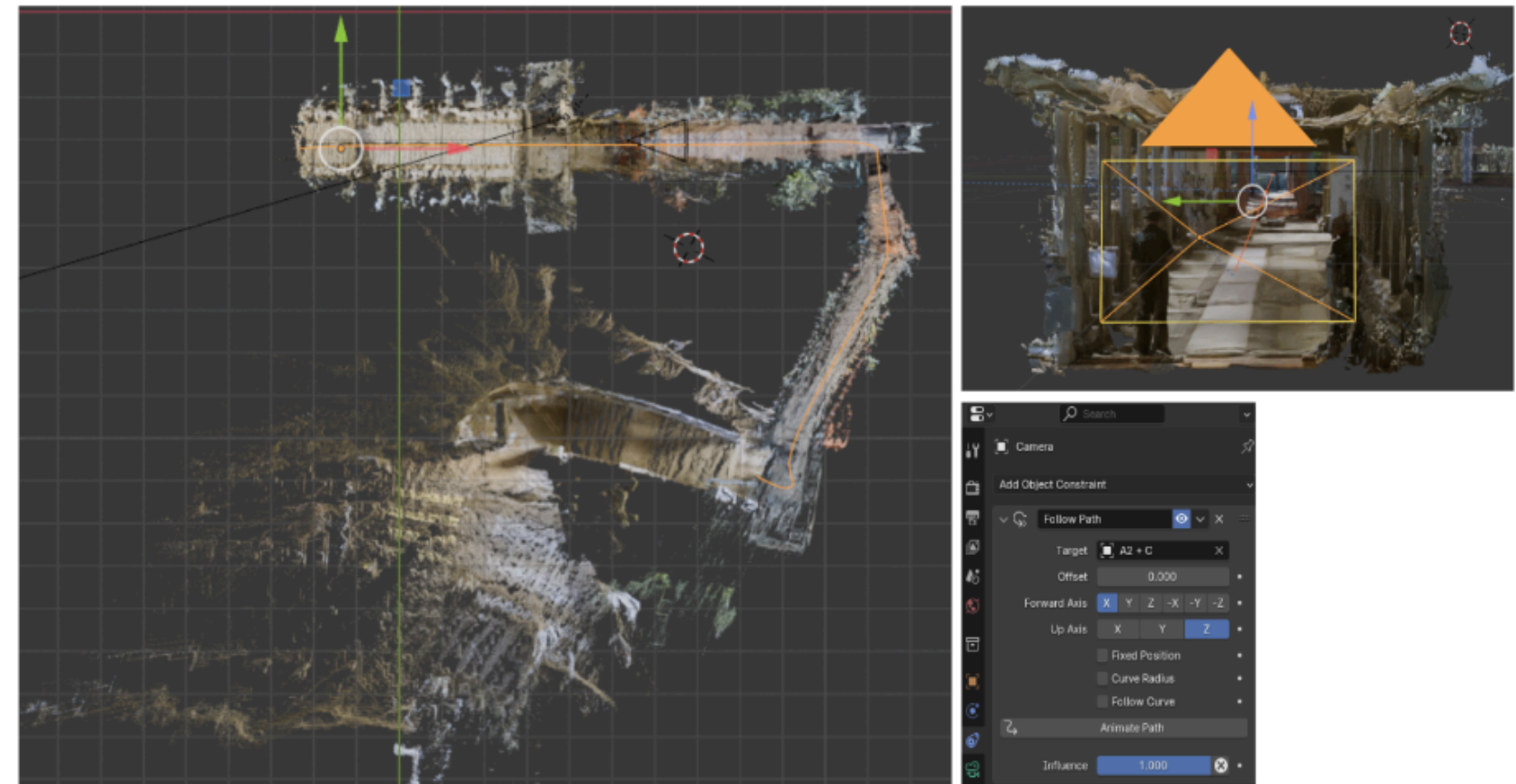


WORKFLOW

Rhino point clouds trimming, Blender point cloud manipulation



Camera path setup and animation process



Moment of

Questions and answers





Thank you!!