

An abstract graphic consisting of several thin, black, irregular lines that intersect and overlap, creating a complex, geometric pattern. The lines form various shapes, including triangles and polygons, and are scattered across the upper left and middle sections of the page.

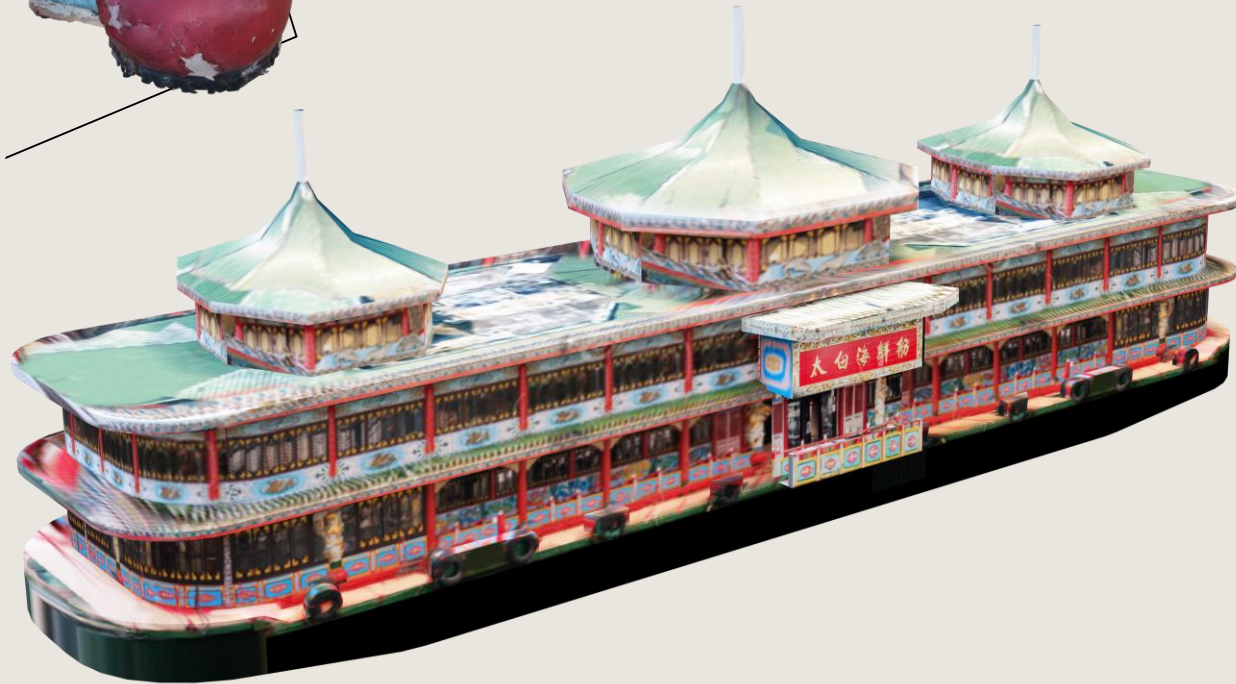
3D ASSET WORKSHOP: CREATE 3D ASSETS WITH PHOTOGRAMMETRY

For The Hong Kong Polytechnic University

Presented by Eugene Mak

Workshop Objective

1. Learn 3D Scanning with Photogrammetry and LiDAR
2. Learn how to prepare these models for multiple uses



WORKSHOP OVERVIEW

1. 3D Scanning
2. Practical Applications (Presentations, animation, VFX, 3D Copying, etc.)
3. 3D Modelling
4. Explore new roadblocks by practicing under guidance



PHOTOGRAMMETRY

PHOTOgraphs + proGRAM = geoMETRY



“SCANABILITY”

- Software needs **colour contrast data**



“SCANABILITY”

ORIGINAL



MATT SURFACE COAT





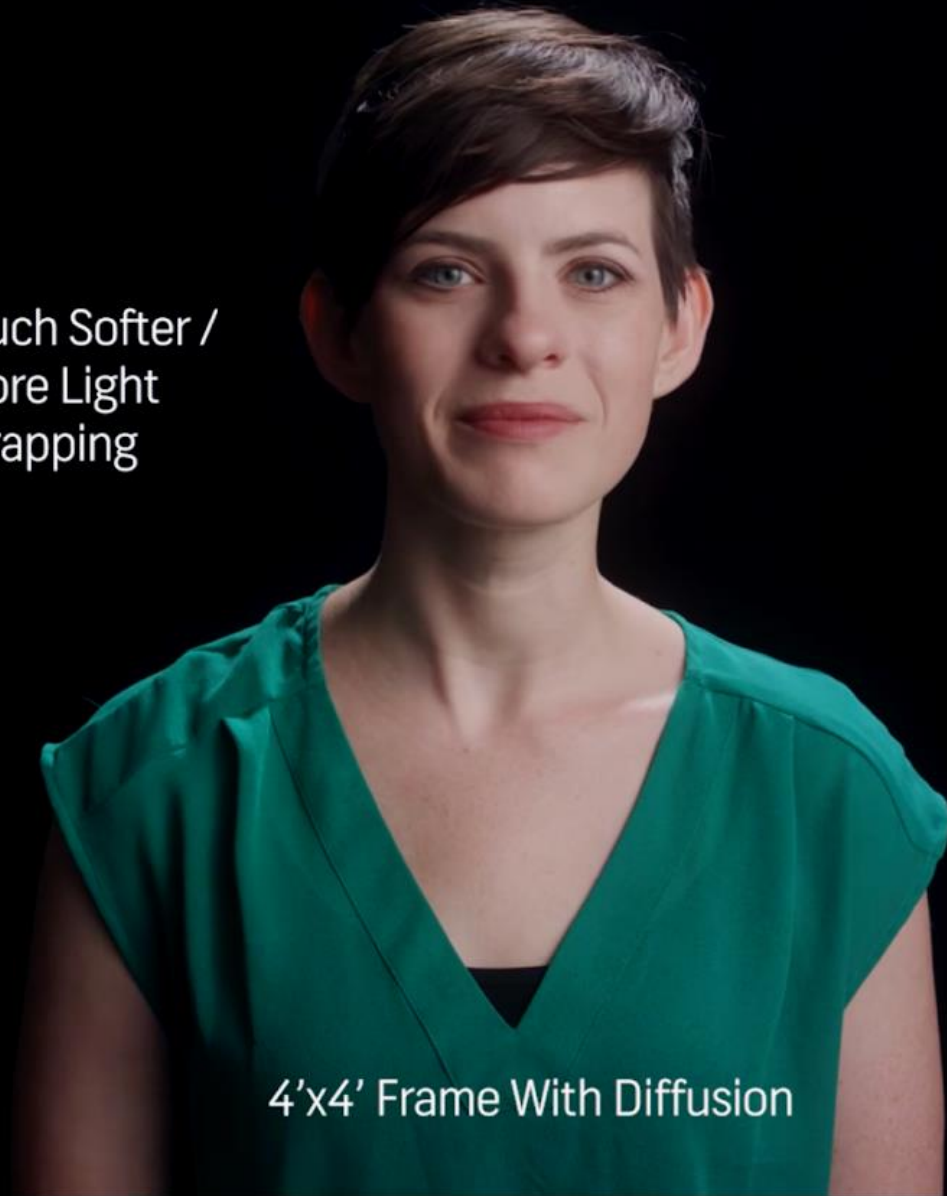
PHOTOgraphy

- Lighting
 - No hard shadows
 - Use diffused lighting (i.e. shower curtain / overcast skies)



Harsh
Shadows
And
Cold Light

Not Diffused



Much Softer /
More Light
Wrapping

4'x4' Frame With Diffusion

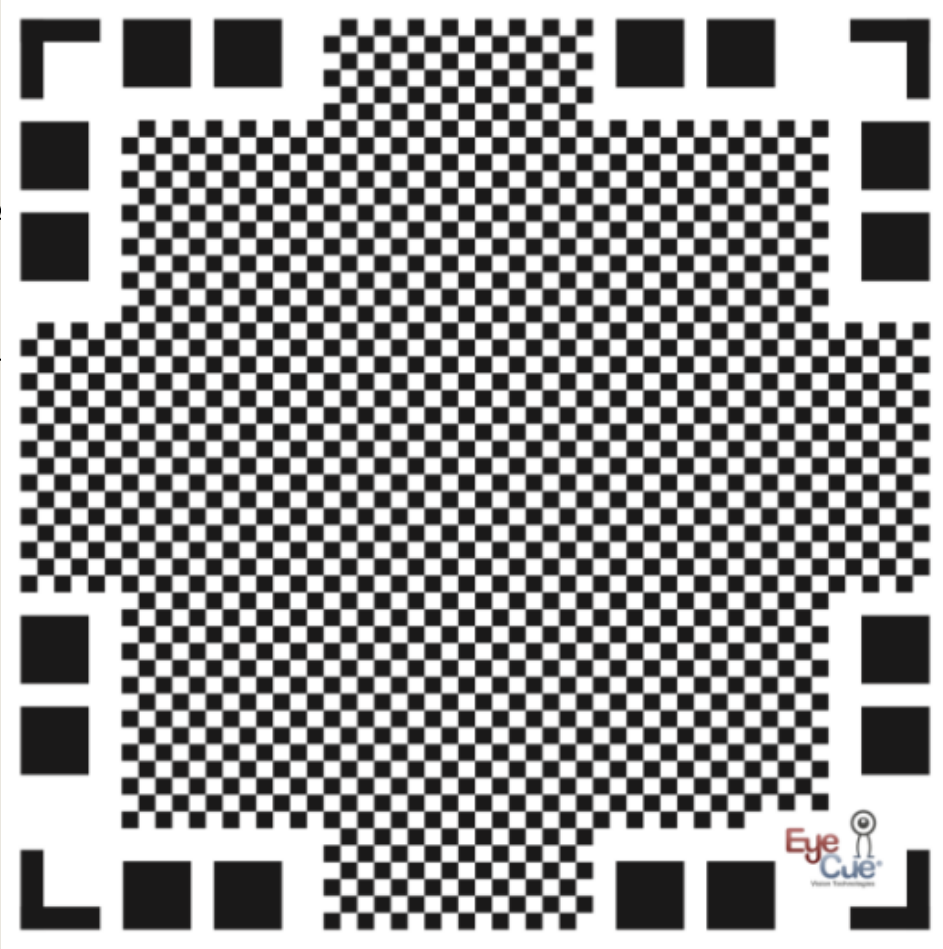




PHOTOgraphy

- Lighting
 - No hard shadows
 - Use diffused lighting (shower curtain / overcast skies)
 - Don't block the light source (create shadows)
 - Light source + object cannot move (unless the BG has no features)

PHOTOgraphy



PHOTOgraphy



PHOTOgraphy

- Lighting
 - No hard shadows
 - Use diffused lighting (shower curtain / overcast skies)
 - Don't block the light source (create shadows)
 - Light source + object cannot move (unless the BG has no reference)
 - De-lighting (Texture painting)
- Camera Setting (Advanced)
 - Aperture(f-stop) / Shutter Speed / ISO
 - Shooting on a boat vs. Tripod + Remote
- Method
 - Capture everything "in frame", maximize sensor area
 - Stay focus! Focal length / Aperture. RIRO
 - 60 – 80% overlap



proGRAM

Mobile Devices:

- PolyCAM
- Reality Scan

Computer (CUDA GPUs):

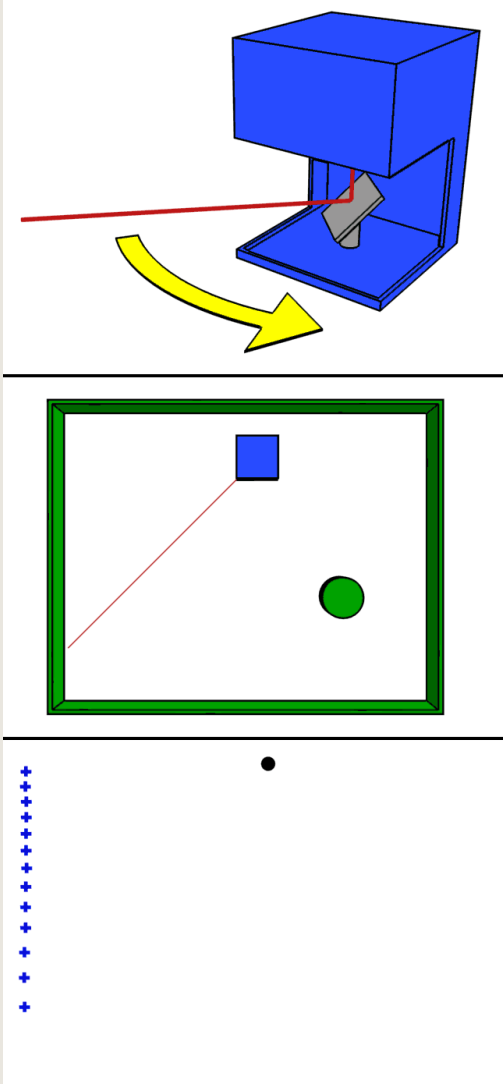
- Meshroom (Open Source)
- Reality Capture (Pay-per-input license)

geoMETRY



LiDAR

Light Detection And Ranging



LiDAR Examples

[CAT Scan](#)

[Street Scan](#)





LiDAR Mobile Devices

iPhone 14 Pro.

iPhone 14 Pro Max.

iPhone 13 Pro Max.

iPhone 13 Pro.

iPhone 12 Pro.

iPhone 12 Pro Max.

iPad 2020 Pro (iPad Pro 12.9 inch 4th gen,

iPad Pro 11 inch 2nd gen)

iPad Pro 2021 13 inch.

PolyCAM



Android



iOS



Reality Scan



iOS Only (at the moment)

PolyCAM



Android

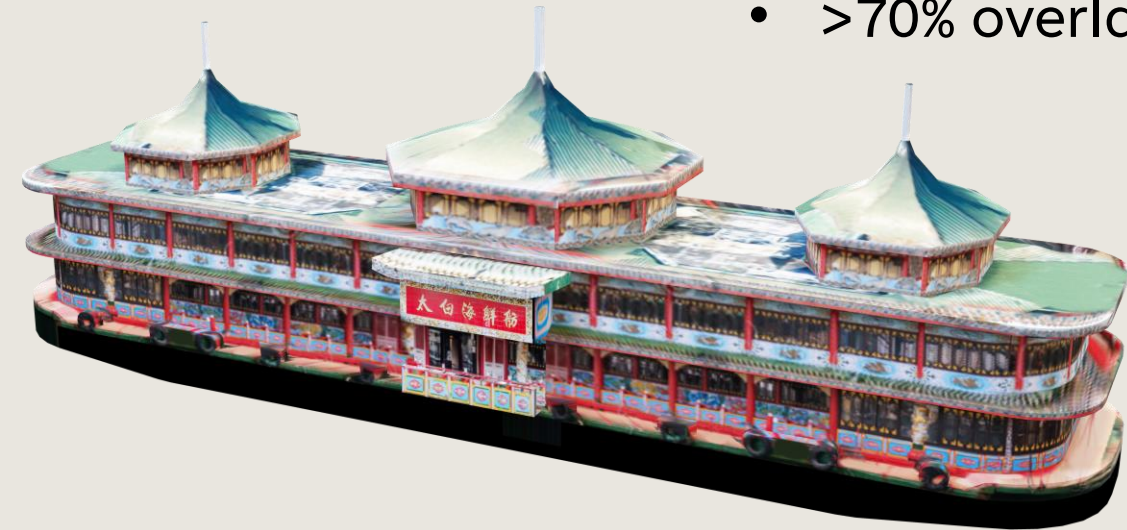


iOS

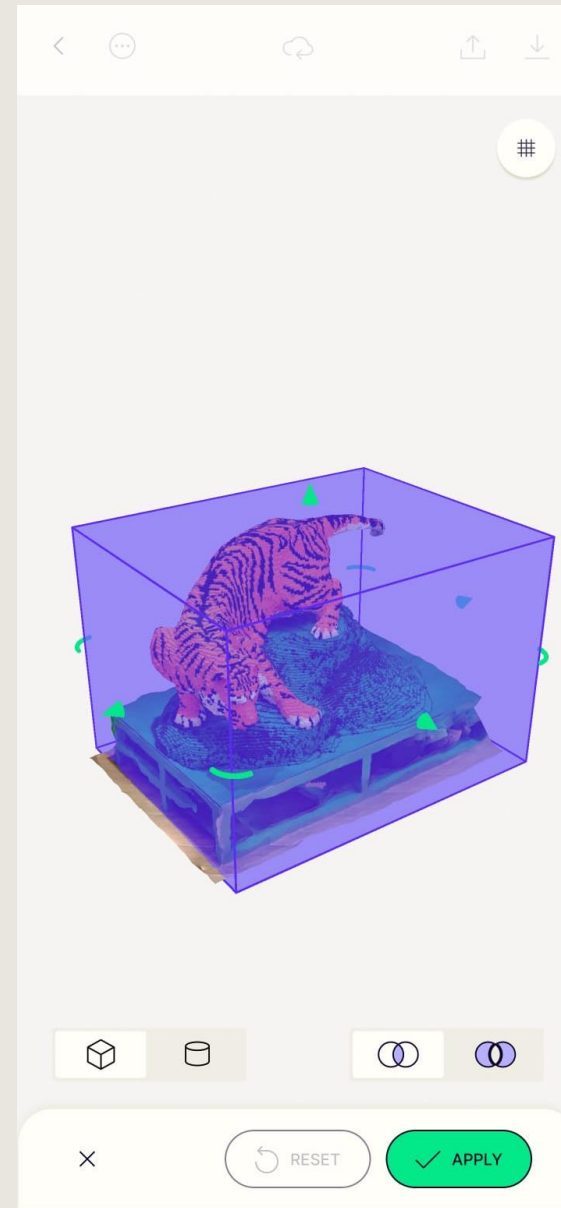
LET'S START SCANNING

Rules

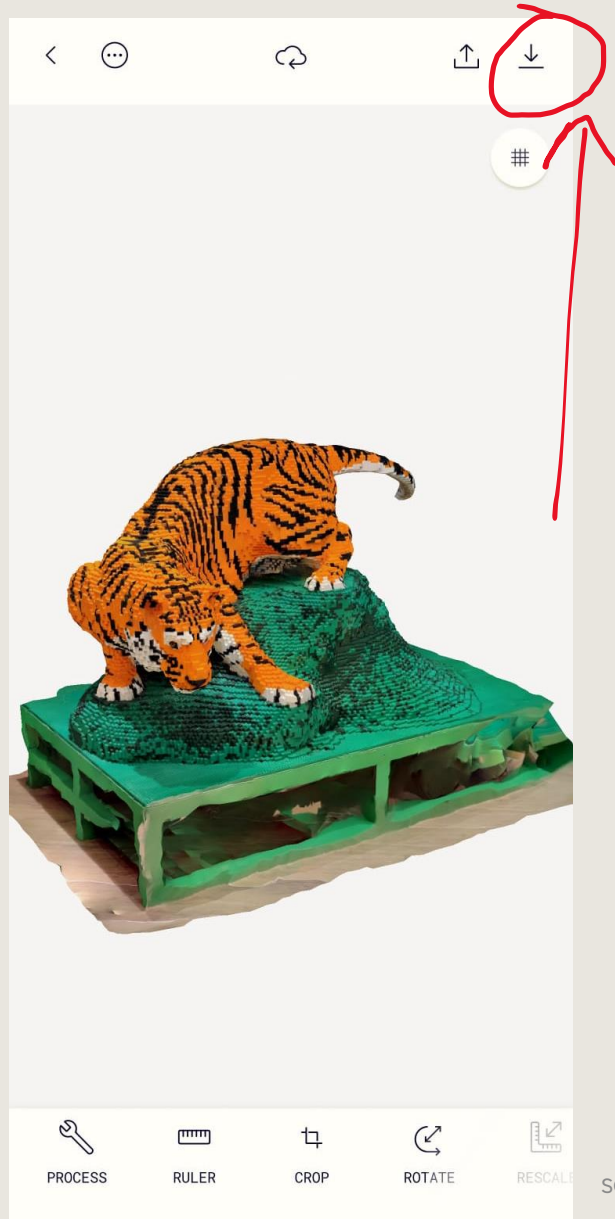
- Don't move the object
- Don't create shadows
- Make sure object is in focus
- Fill up the frame
- >70% overlap



Clean up in PolyCAM



PolyCAM Export



Export .gltf file format

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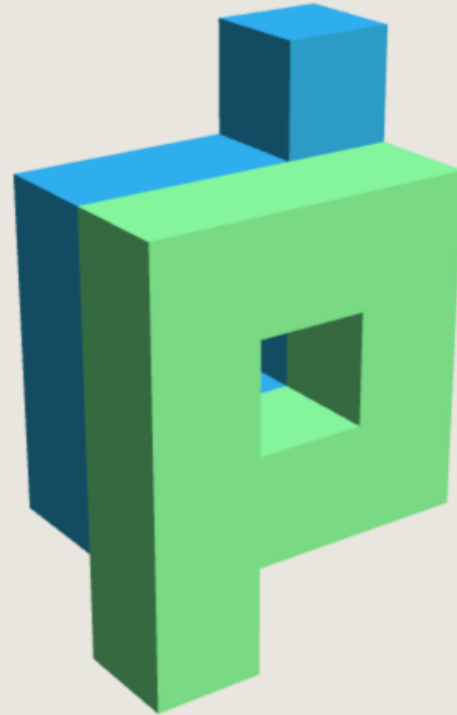




Monster Mash

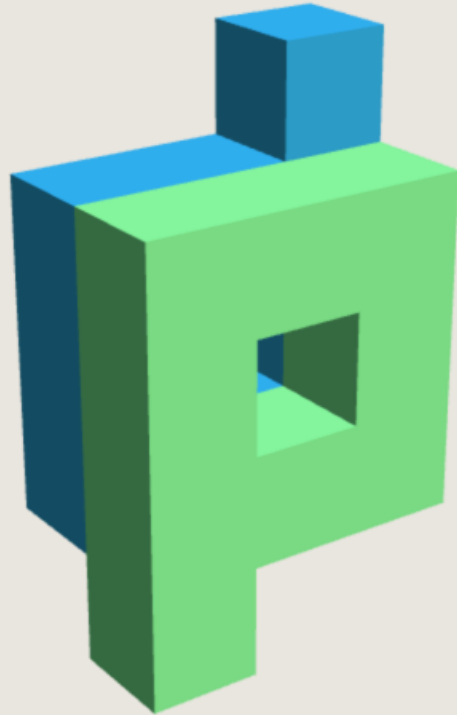
<https://monstermash.zone/>

PolyCAM -> AR Workflow



<https://p3d.in/>

PolyCAM -> AR Workflow



- Drag and Drop .glb
- Setup Material
- Optimize Textures
- Set Default View
- HDRI Settings
- Enable AR

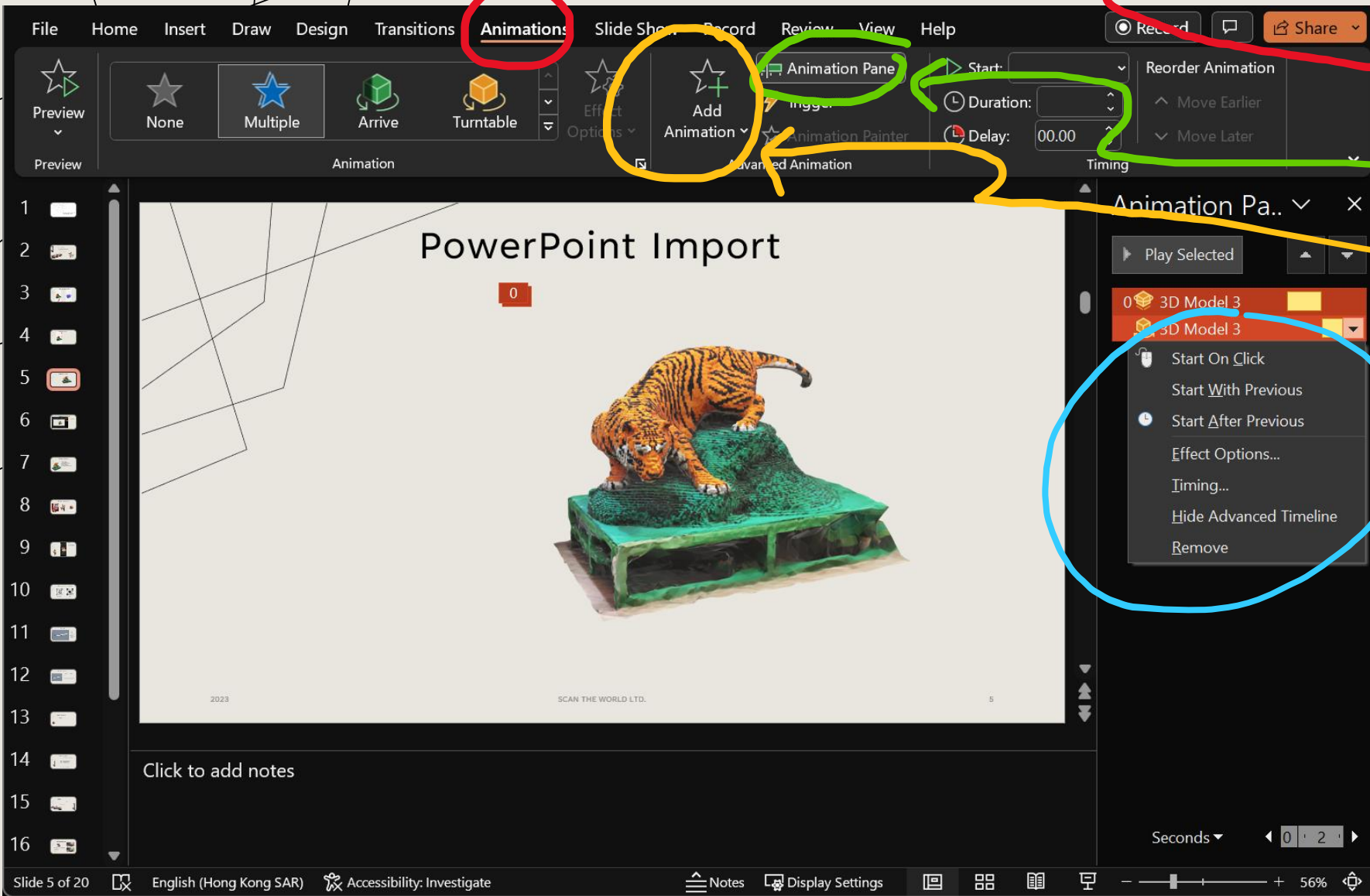
<https://p3d.in/>

PowerPoint Import



Drag Pup Here..

PowerPoint Animation

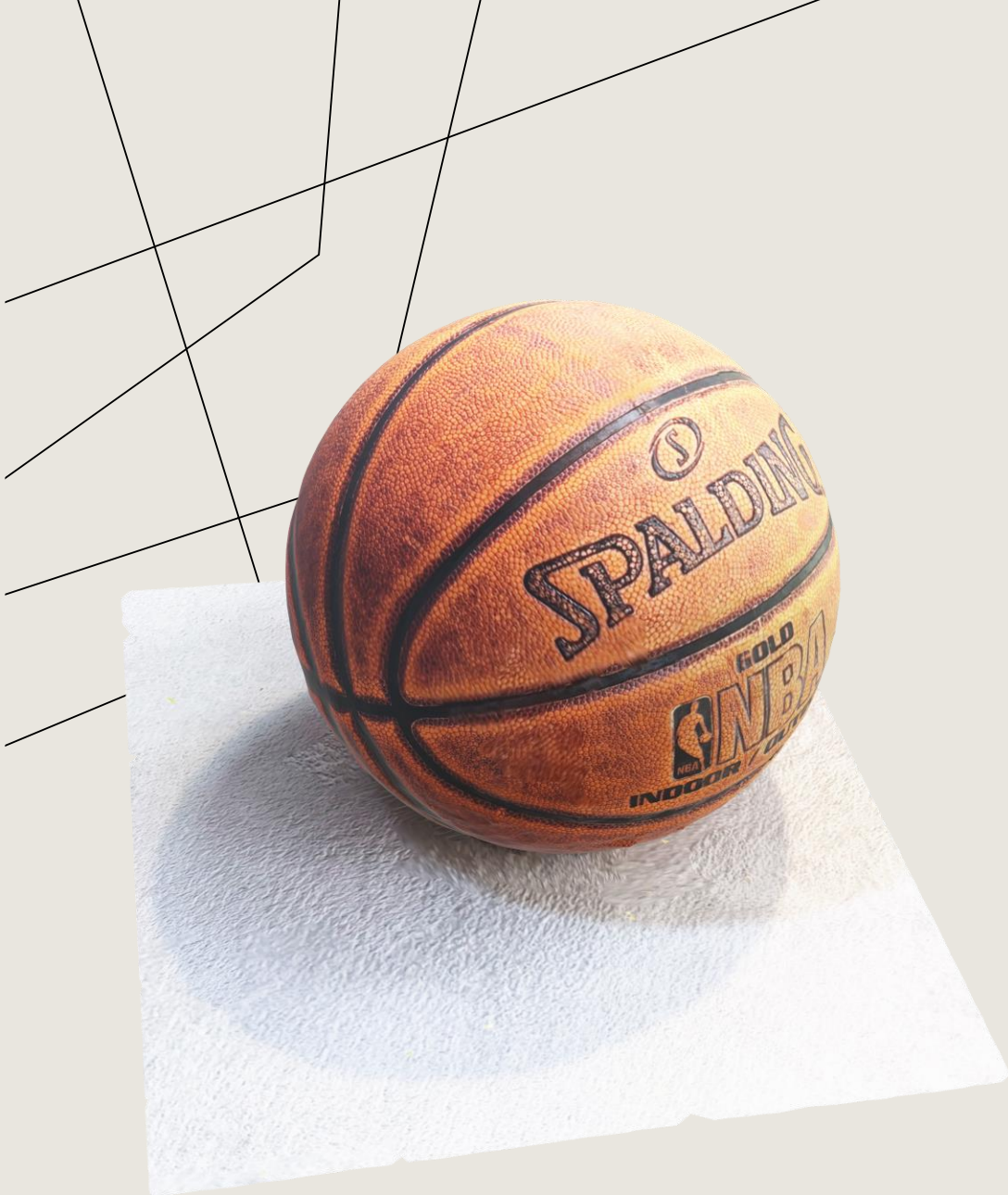


- Animation Tab
- Animation Pane
- Add Animation
- More options (Right Click)
 - Timing
 - Repeat
 - Axis of Rotation

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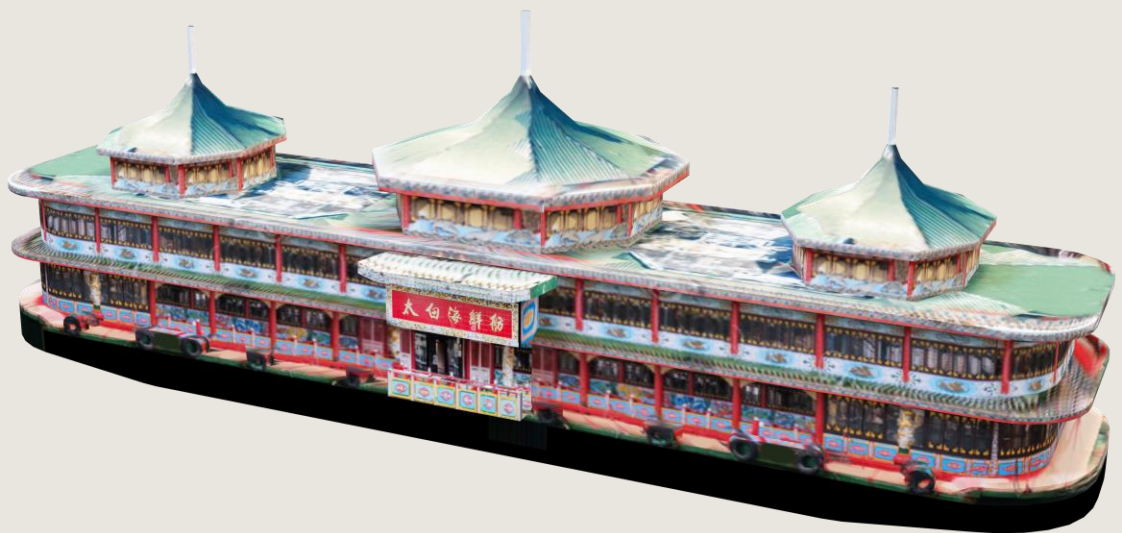




3D MODELLING



blender.org



TODAYS 3D MODELLING WORKFLOW

Baby Pool

- Basic Blender Controls

Shallow end

- Merge and Crop mesh

Medium depth

- “Water-tight”, UV mapping, Bake texture

Deep End

- Simplify Mesh, Sculpt, Re-Topography, Texture Painting

Really Deep End

- Procedural shading (Nodes/Blueprint in Unreal and Blender)

The Abyss

- Mixing Math, Time and Materials.
- Limitless things that I don't know