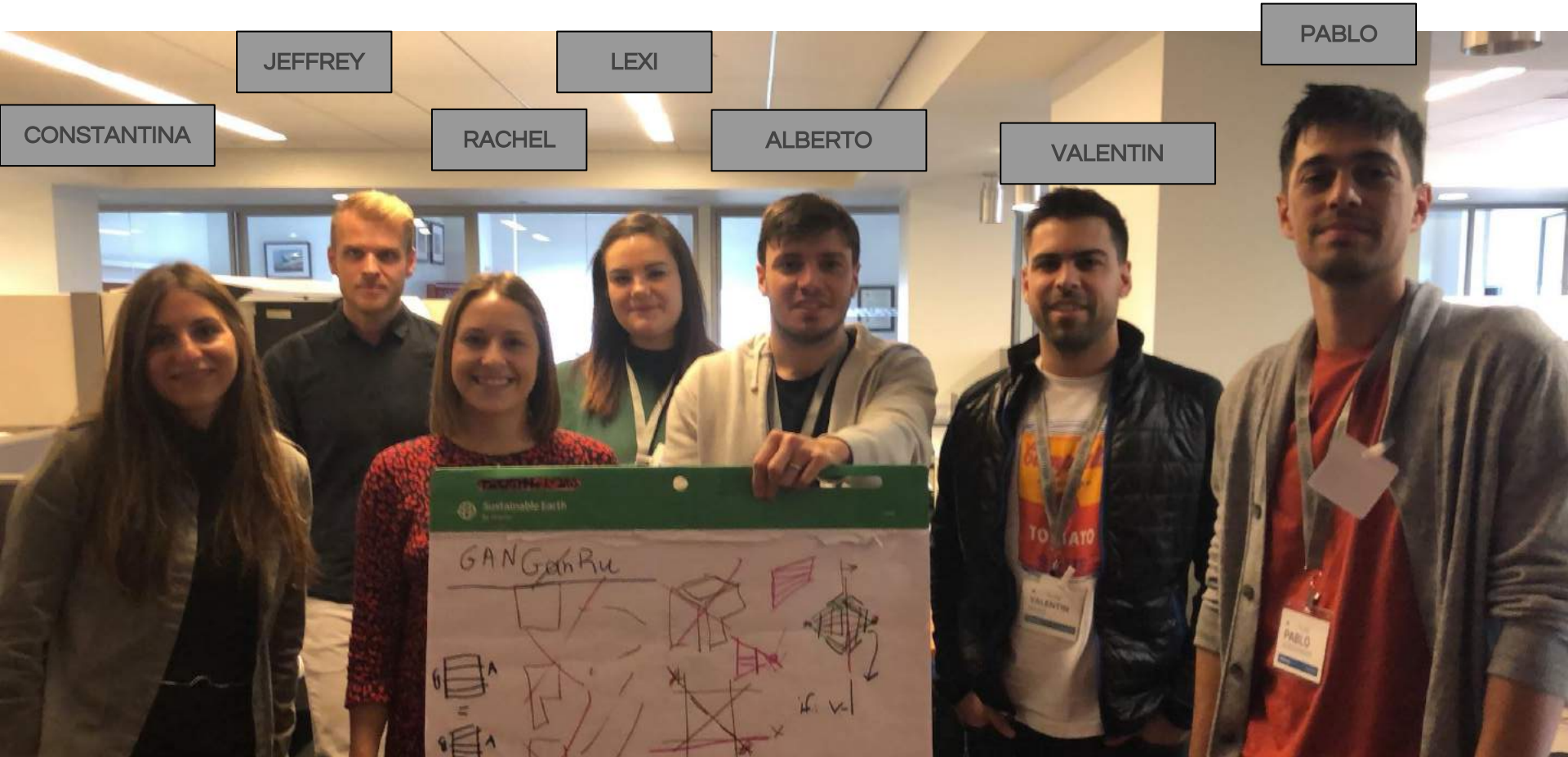
EXPLORE THE OUTBACK

GANgaru

Spring your sketches to life with GANgaru, an Outback app

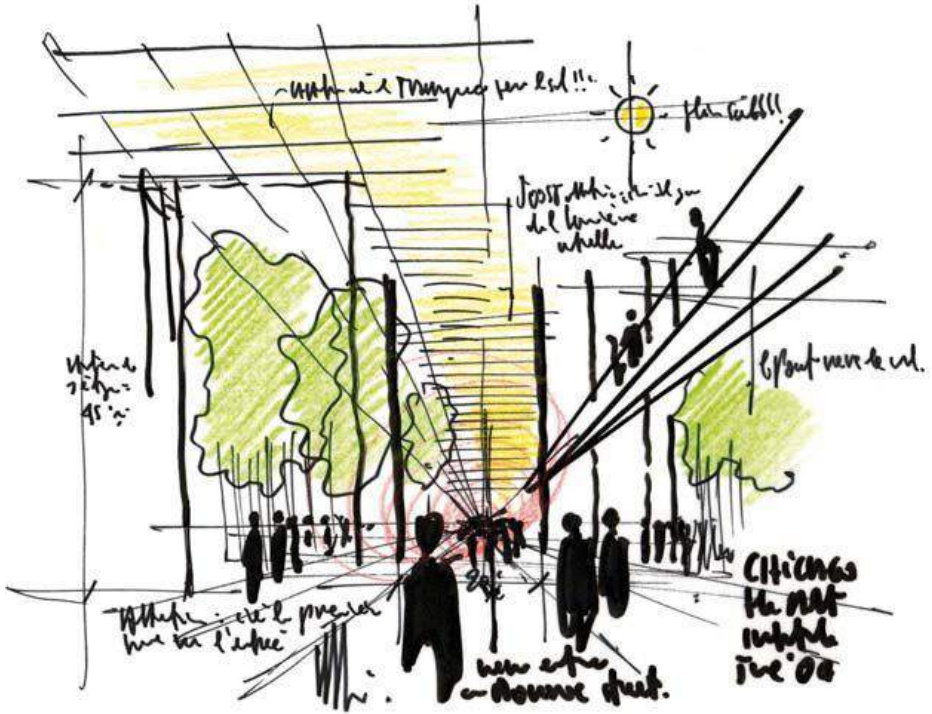
Meet the GANgaru Team



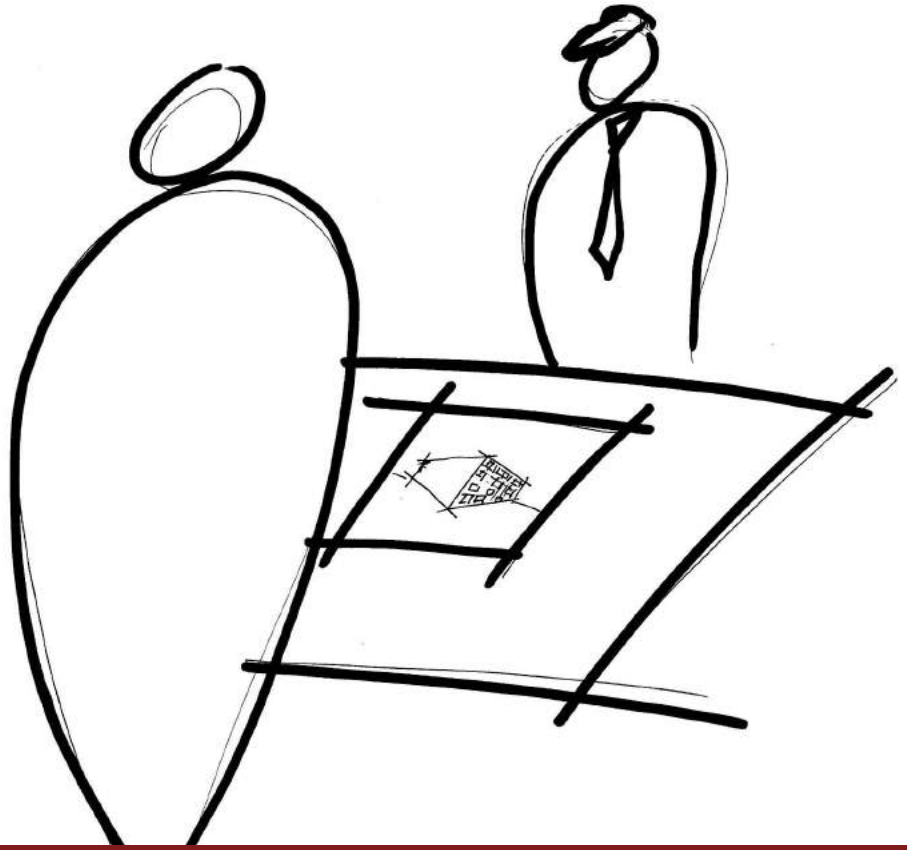
PROBLEM STATEMENT
WHAT ARE WE TRYING TO SOLVE?

How can we **enable a paradigm shift** of an entire industry **to move from a 2D deliverable to 3D**?

PROBLEM STATEMENT



USE CASE: Client Presentation



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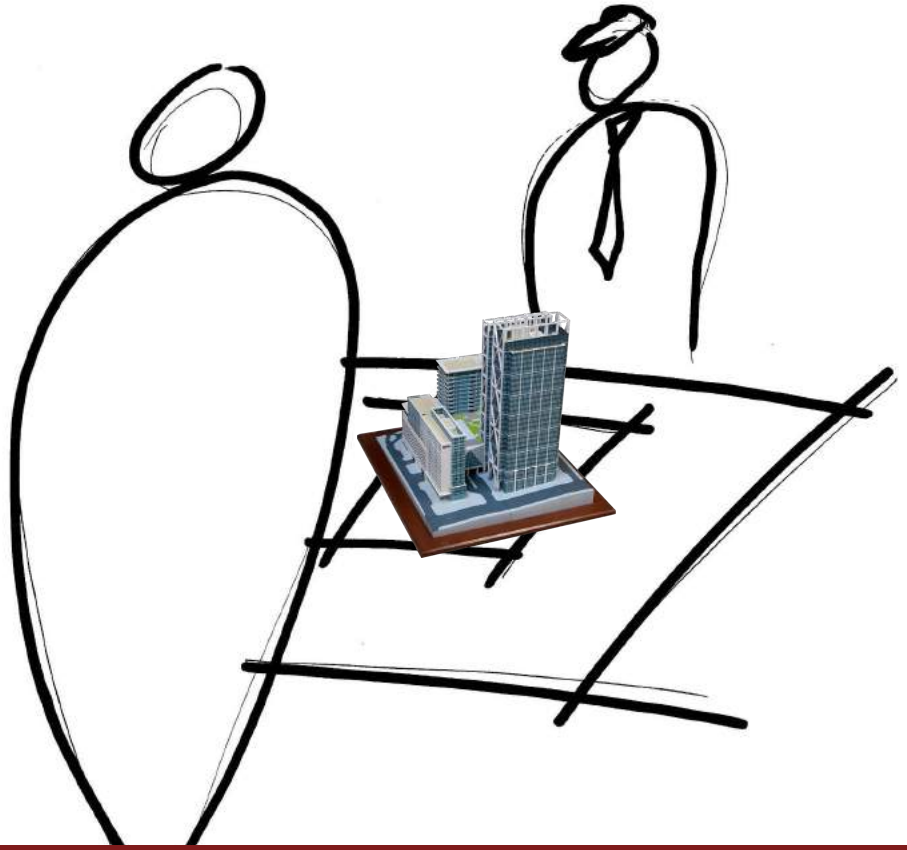
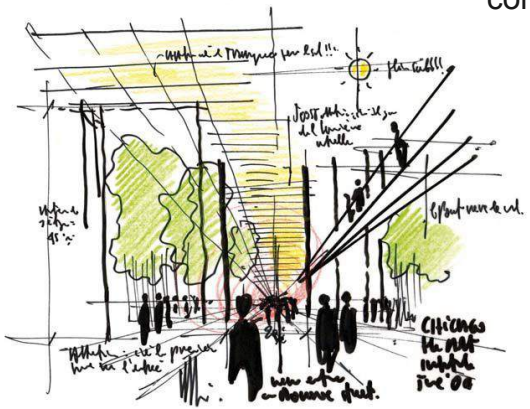
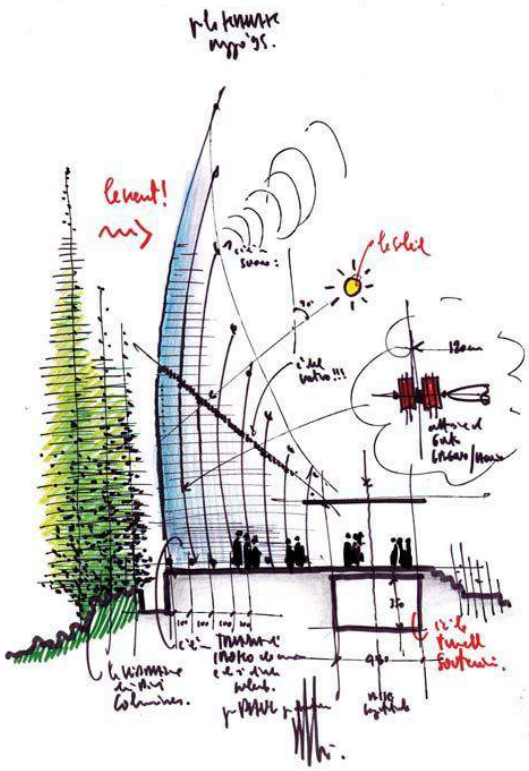


Theory of Sketches

The sketch is the right solution to gather volumes and structure, to put together context and details.





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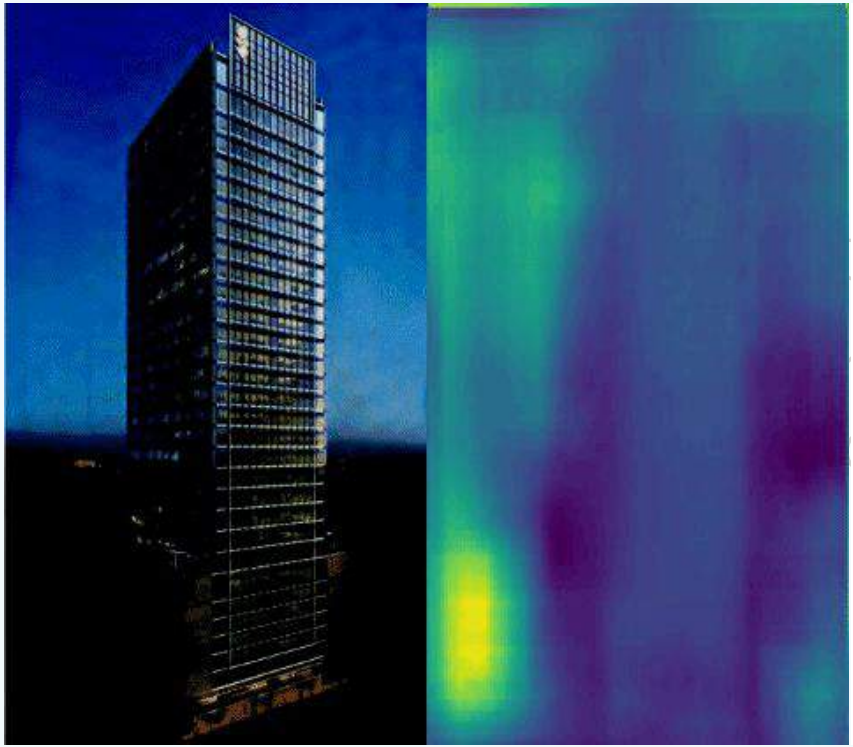
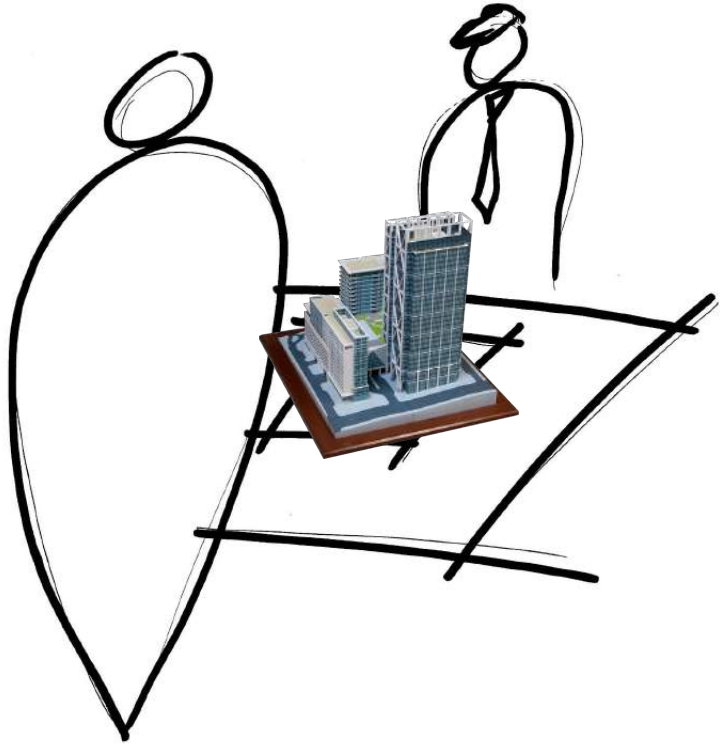


USE CASE: CLIENT PRESENTATION

WHO ARE WE SOLVING FOR?



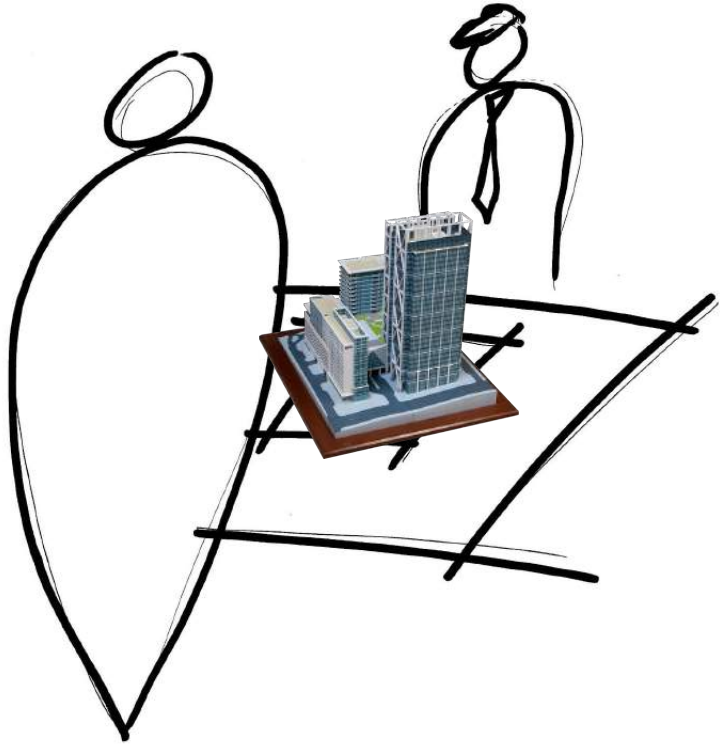
Designers often do not have the knowledge or time to transfer their sketch to a 3D model.

What if there was a way for a designer to move their sketch to 3D in real-time & reduce the cognitive load?

ENABLES A PARADIGM SHIFT

USE CASE: CLIENT PRESENTATION

WHO ARE WE SOLVING FOR?



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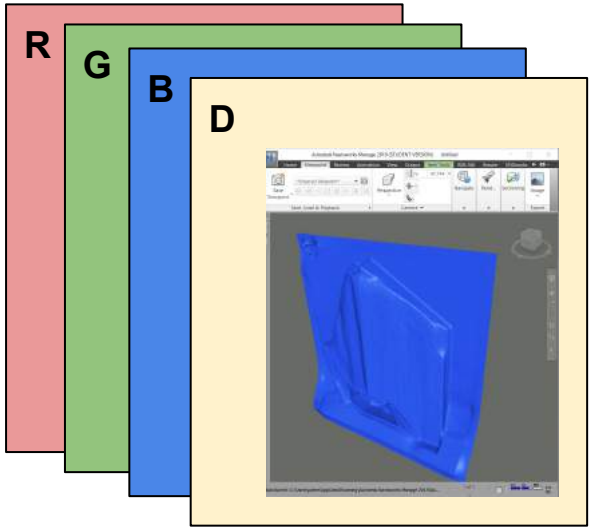
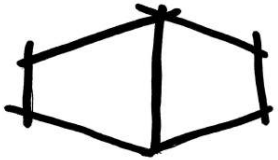
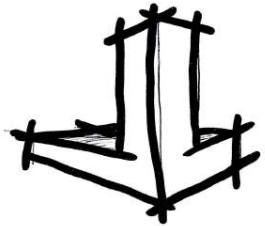
GANgaru FUNCTIONALITY

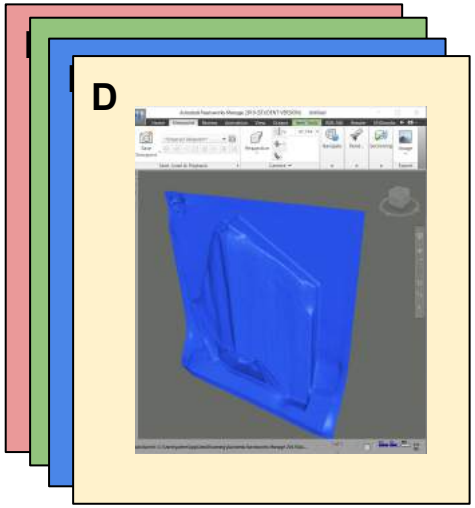


RGB+D

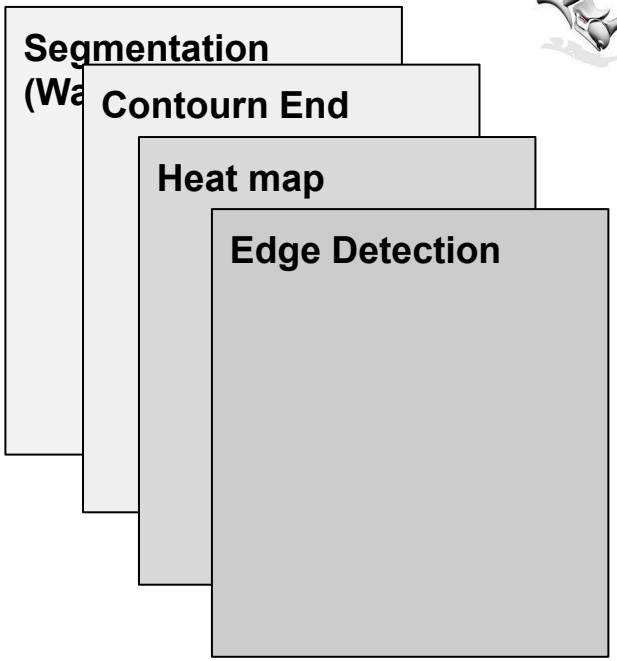




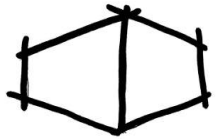
GANgaru FUNCTIONALITY

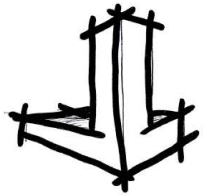


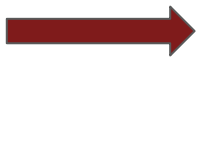
RGB+D

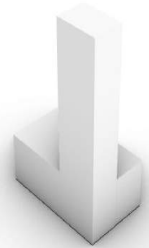


CLEANING









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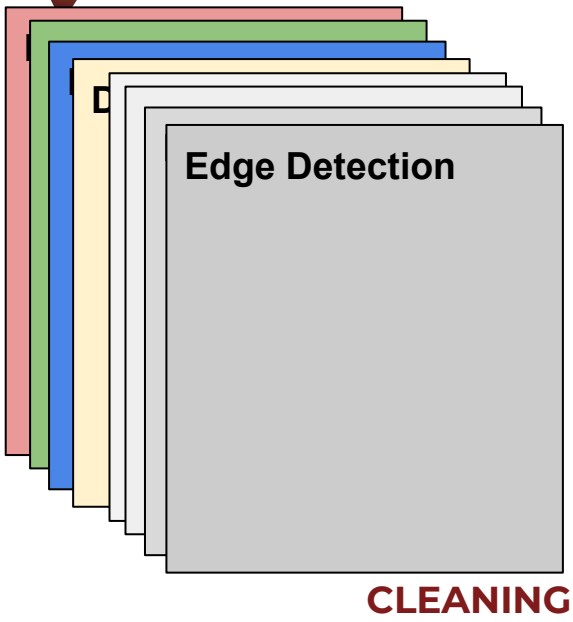

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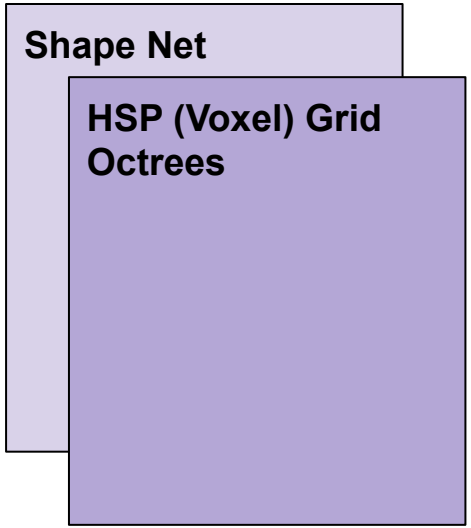


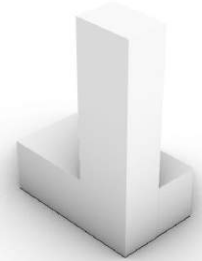
3D MODEL

GANgaru FUNCTIONALITY

HSP (Voxel) Grid
Octrees

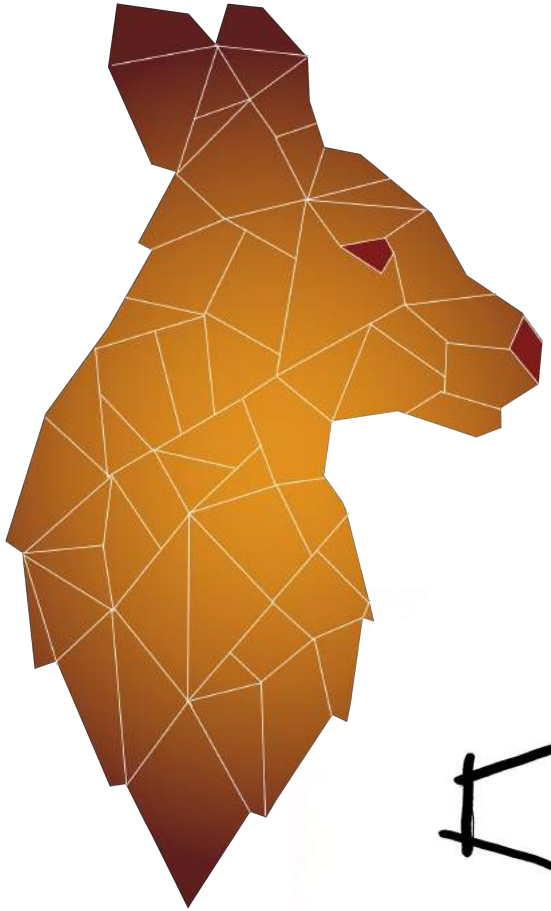
3D MODEL

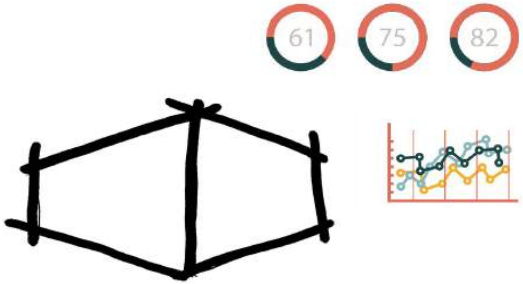
COMPUTATION



three.js

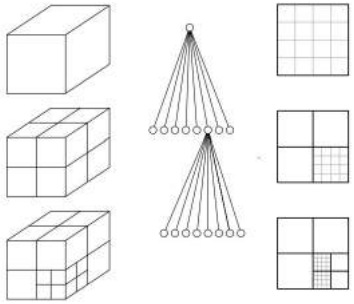
Data driven sketch with GANgaru





THANK YOU

BACKEND



https://github.com/chaene/hsp

RGBD (color and depth) images from a single color image and fuse them in a post-processing step

Hierarchical Surface Prediction for 3D Object Reconstruction

Christian Häne, Shubham Tulsiani, Jitendra Malik
University of California, Berkeley
{chaene, shubhtuls, malik}@eecs.berkeley.edu

***Abstract*—Recently, Convolutional Neural Networks have shown promising results for 3D geometry prediction. They can make predictions from very little input data such as a single color image. A major limitation of such approaches is that they only predict a coarse resolution voxel grid, which does not capture the surface of the objects well. We propose a general framework, called hierarchical surface prediction (HSP), which facilitates prediction of high resolution voxel grids. The main insight is that it is sufficient to predict high resolution voxels around the predicted surfaces. The exterior and interior of the objects can be represented with coarse resolution voxels. Our approach is not dependent on a specific input type. We show results for geometry prediction from color images, depth images and shape completion from partial voxel grids. Our analysis shows that our high resolution predictions are more accurate than low resolution predictions.**

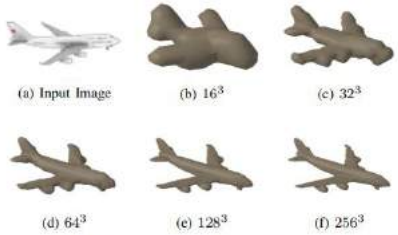


Figure 1: Illustration of our method on the task of predicting geometry from a single color image. From the image our

PYTORCH

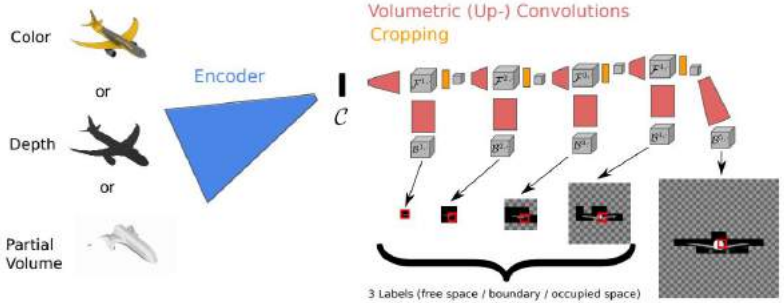
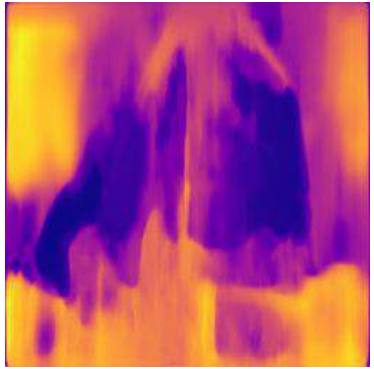
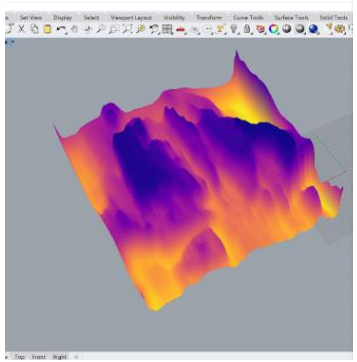


Figure 2: Overview of our system

Proposed Solution

Create a rendered image of your sketch to support a client's visualization of design concepts



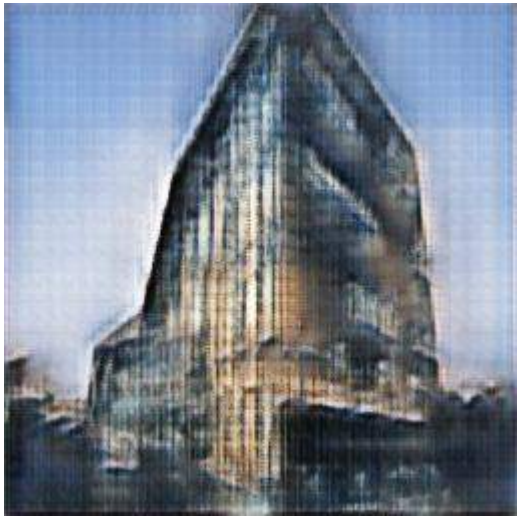


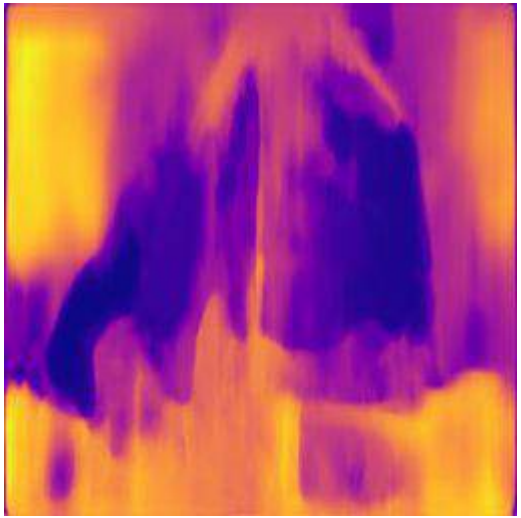
Generate a 3D model used for actual documentation and further design development

Pre-hackathon development

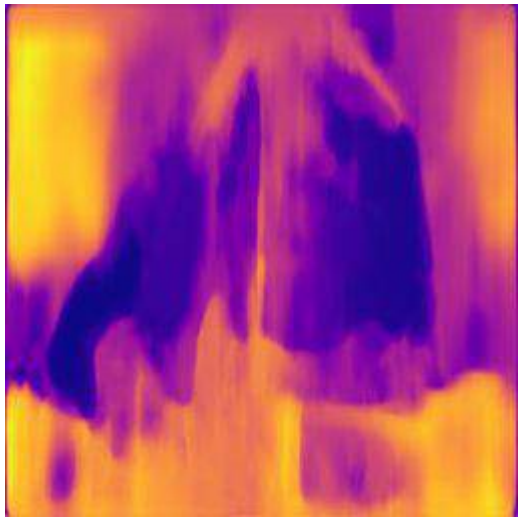
Based on sketchGAN and cycleGAN repositories

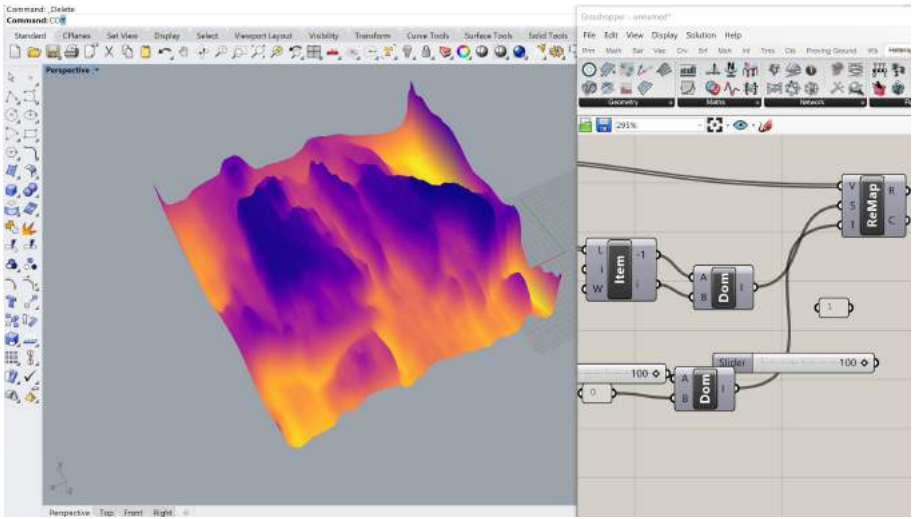
Hackathon ML progress





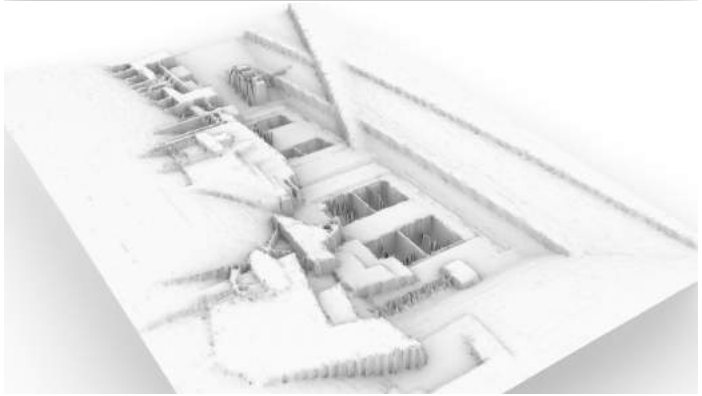
Hackathon 3d prototyping





Translation of the depth image to generate 3d geometry

Hackathon 3d prototyping



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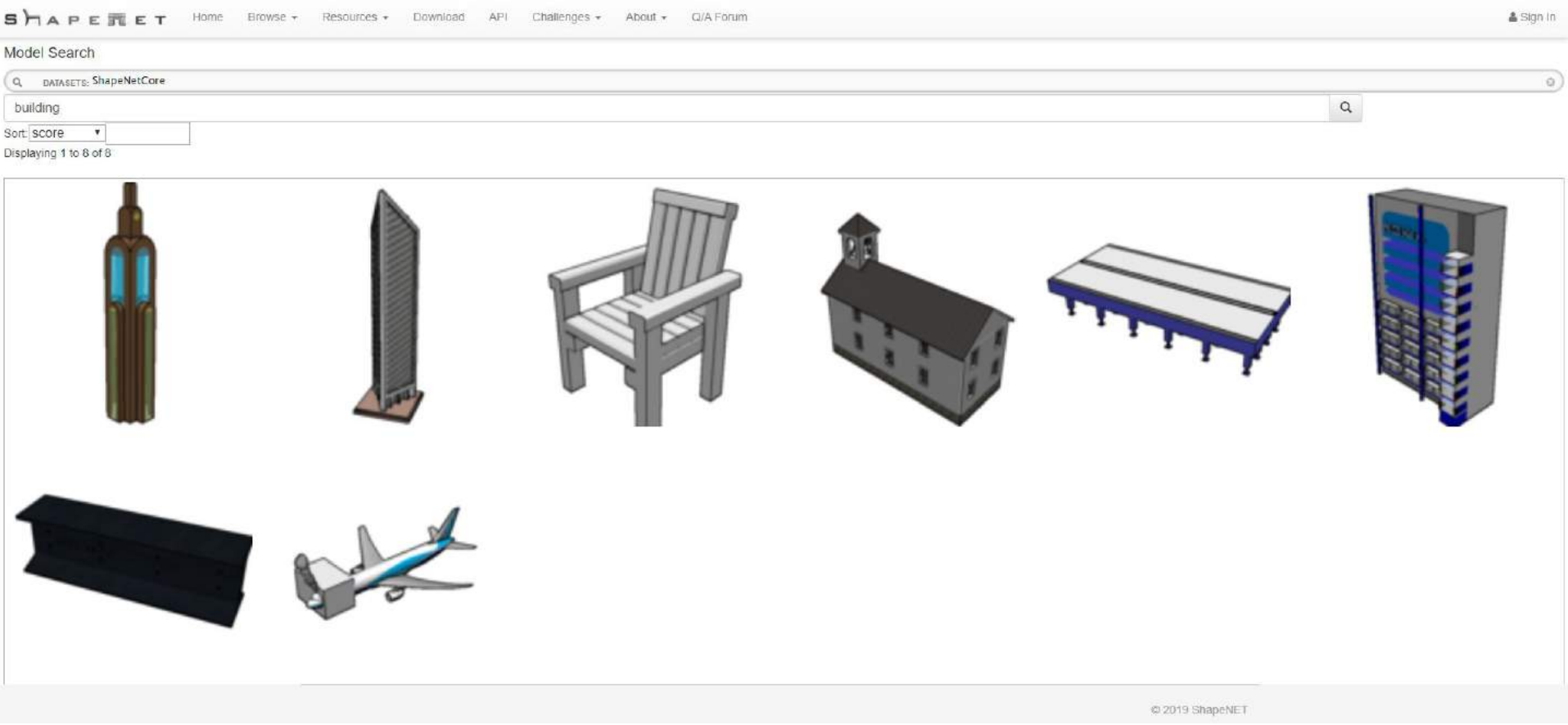
Technical Solution



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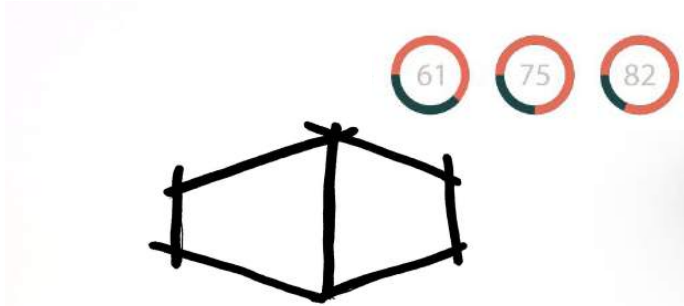
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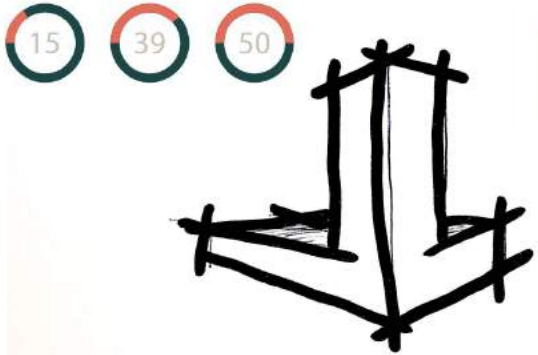
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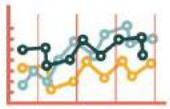
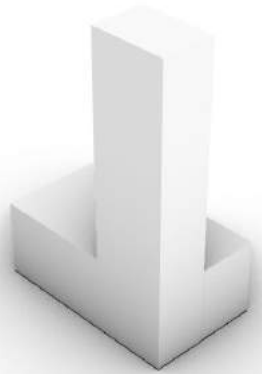


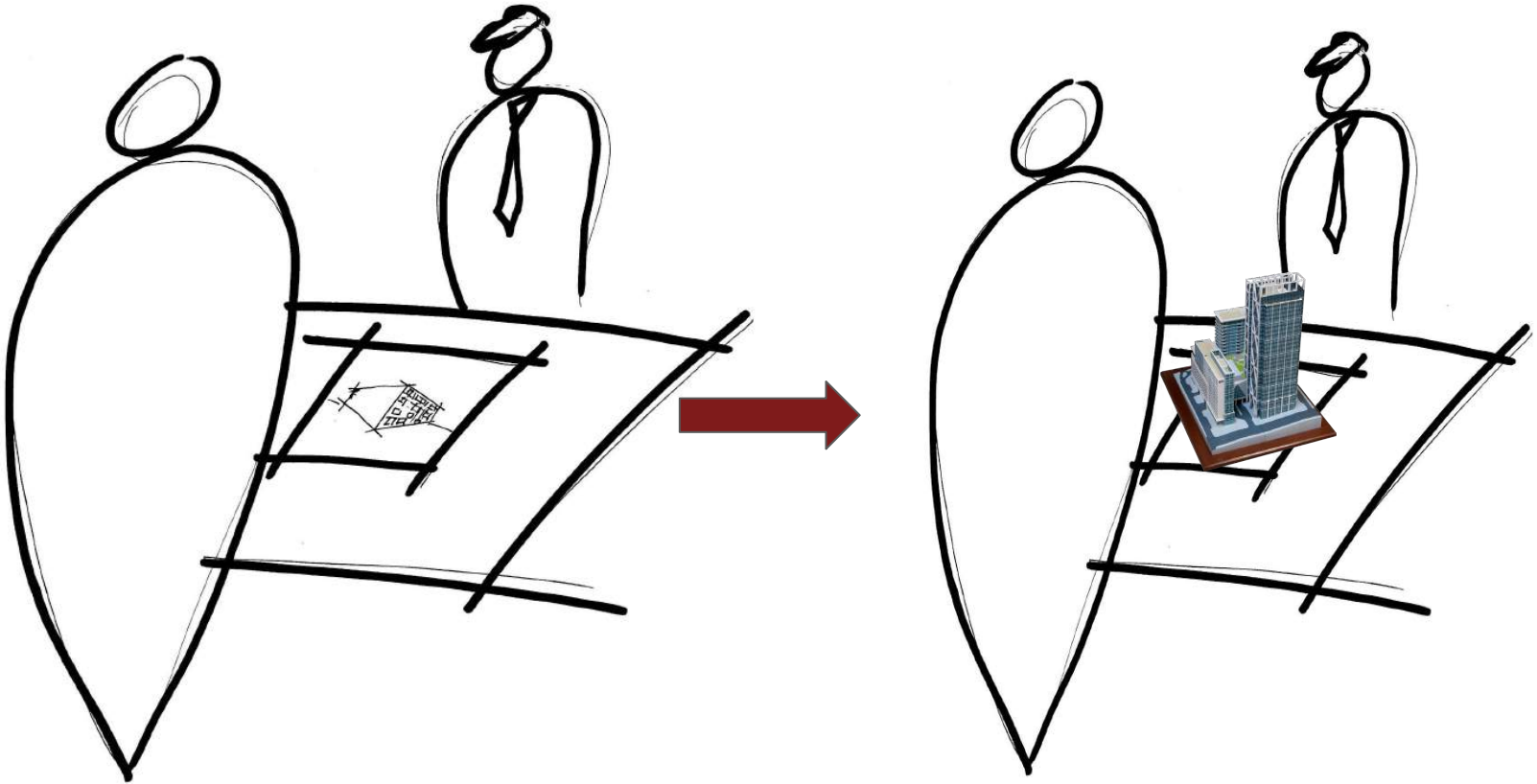


USE CASE

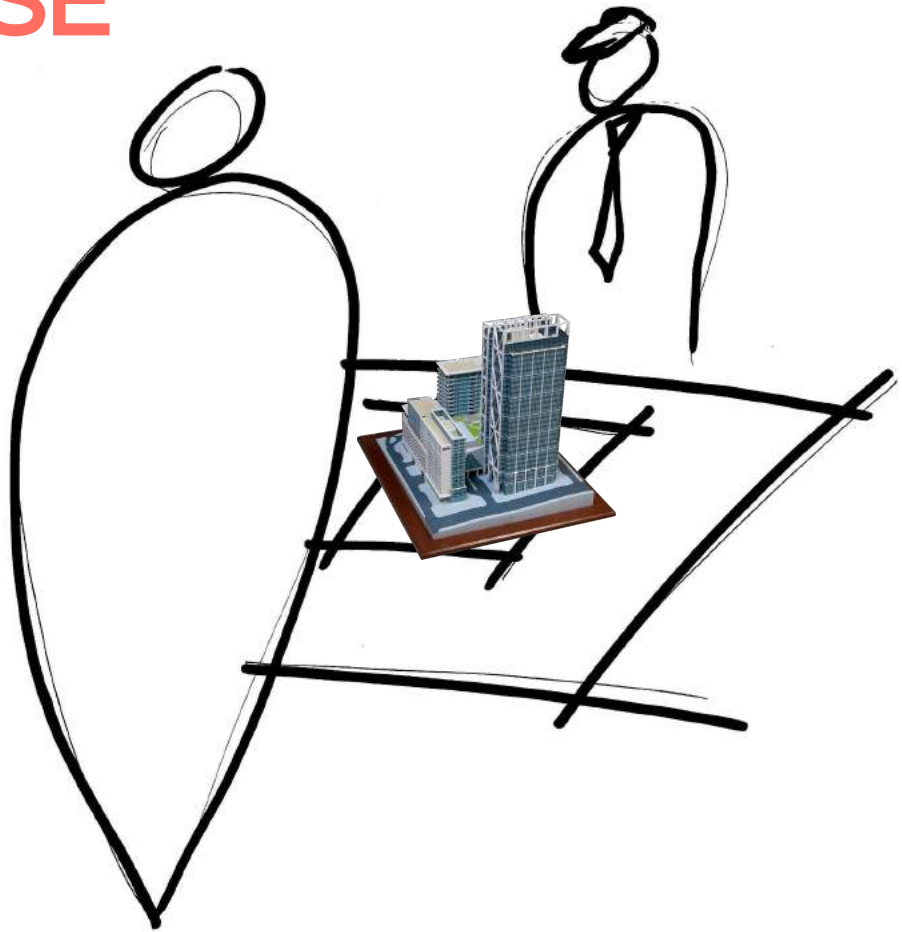
EDUCATIONAL

CLIENT PRESENTATION

ENABLER PARADIGM SHIFT



USE CASE



Progress

Rhinoceros®

esri®

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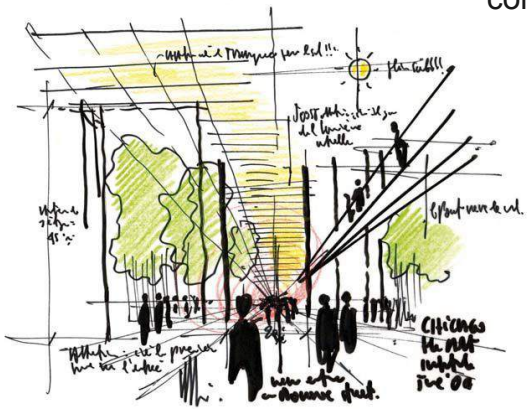

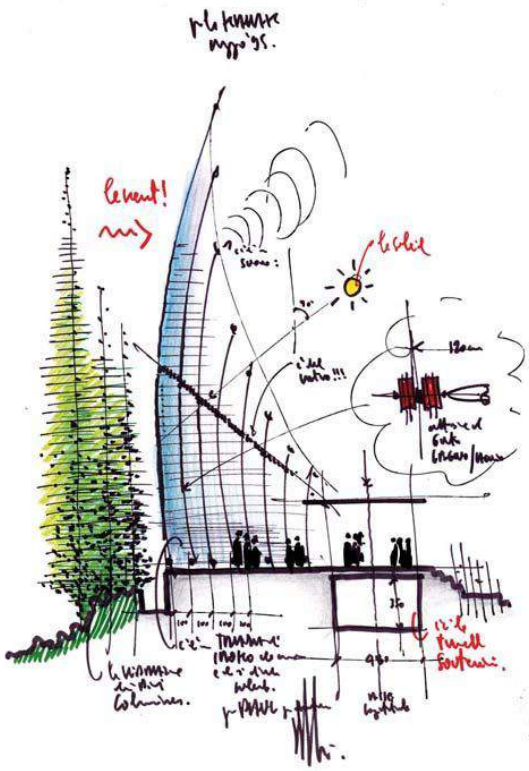

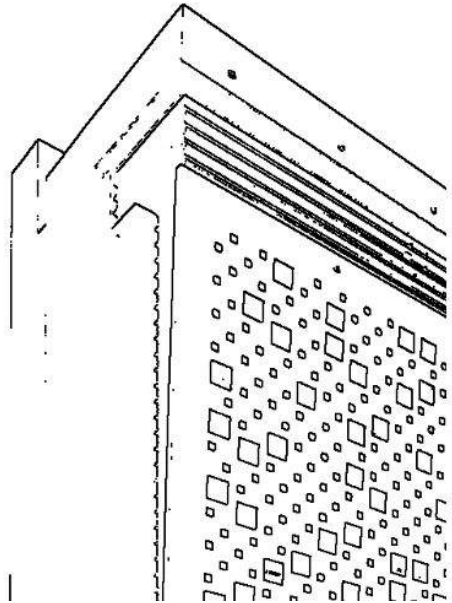

Hierarchical Surface Prediction for 3D Object Reconstruction

Surface - Depth -

References

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https://deepmind.com/blog/article/neural-scene-representation-and-rendering
https://colmap.github.io/
https://www.youtube.com/watch?v=BjwhMDhbqAs&t=15s
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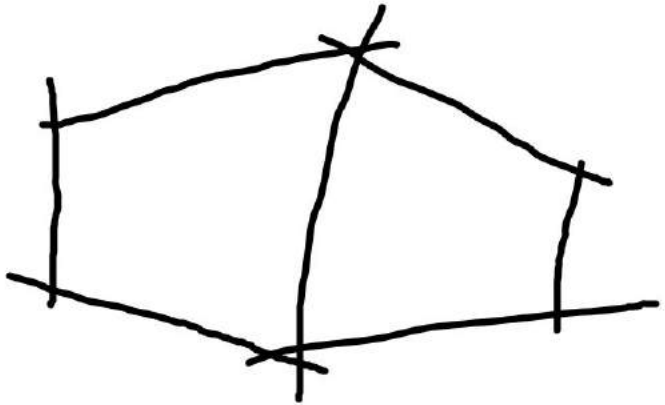

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https://quickdraw.withgoogle.com/
https://github.com/googlecreativelab/quickdraw-dataset

Generative Query Network (GQN), a framework within which machines learn to perceive their surroundings by training only on data obtained by themselves as they move around scenes