



COMPUTER VISION

3D OBJECT RECONSTRUCTION

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INTRODUCTION



3D object reconstruction is a critical area in computer vision, enabling machines to understand and interact with the real world in three dimensions. Deep learning has revolutionized this field by providing powerful tools to create accurate and detailed 3D reconstructions.

PROJECT PROPOSAL

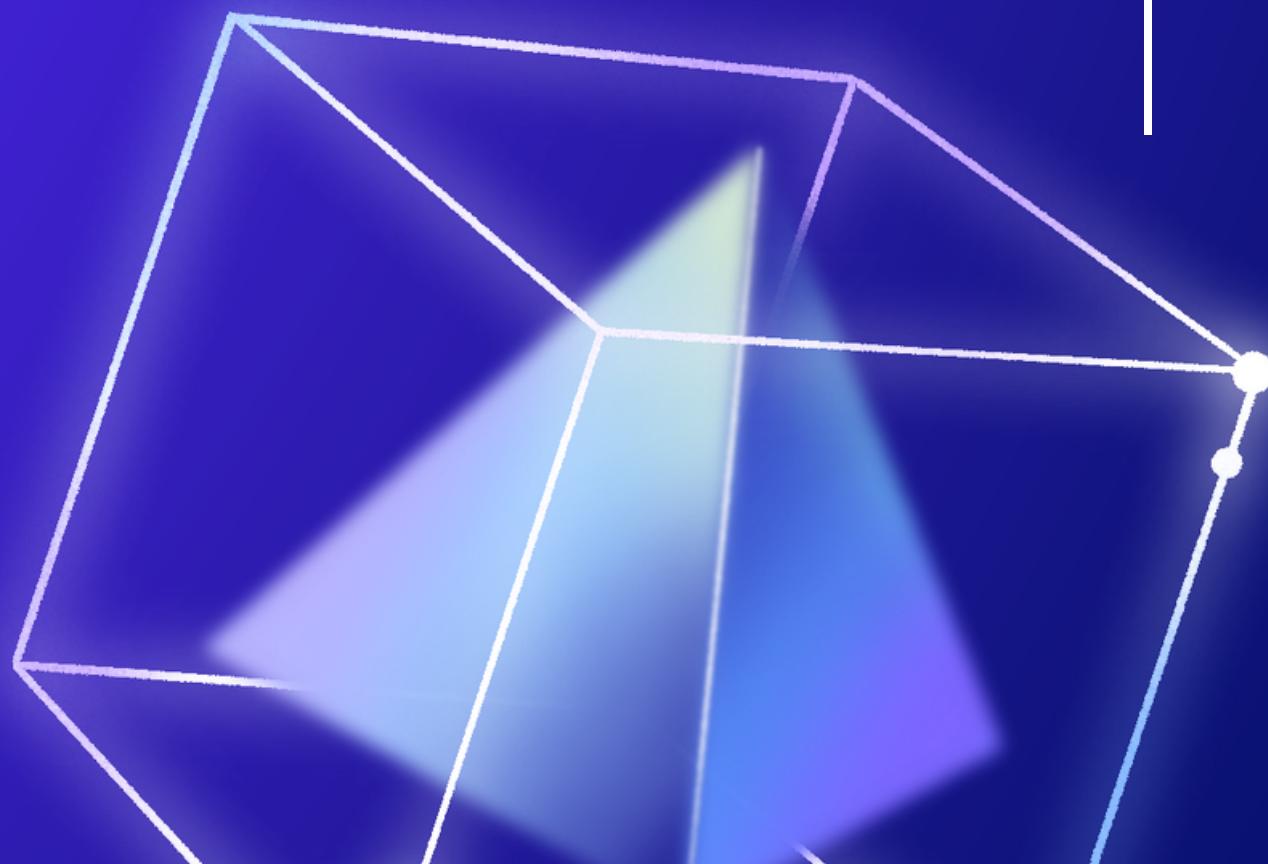
1. To develop a deep learning model for 3D object reconstruction
2. To Implement evaluation metrics and strategies To assess and improve the accuracy of 3D reconstructions
3. To provide resources and documentation





LITERATURE SURVEY

- PointNet: Deep Learning on Point Sets for 3D Classification and Segmentation
- DeepVoxels: Learning Persistent 3D Feature Embeddings
- Pixel2Mesh: Generating 3D Mesh Models from Single RGB Images

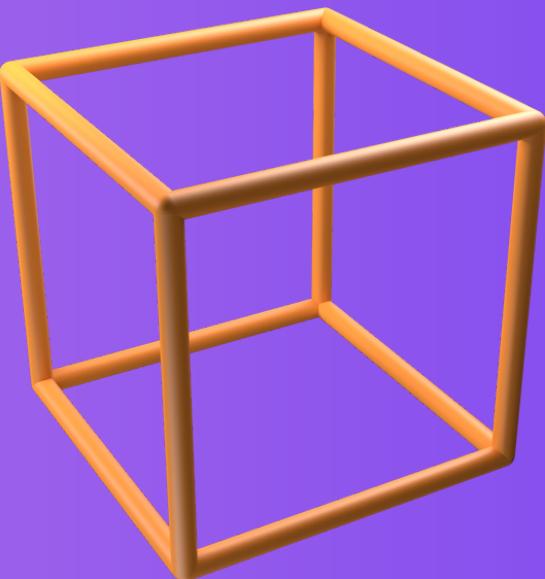


2017

POINTNET: DEEP LEARNING ON POINT SETS FOR 3D CLASSIFICATION AND SEGMENTATION



Authors: Charles R. Qi, Hao Su, Kaichun Mo, Leonidas J. Guibas

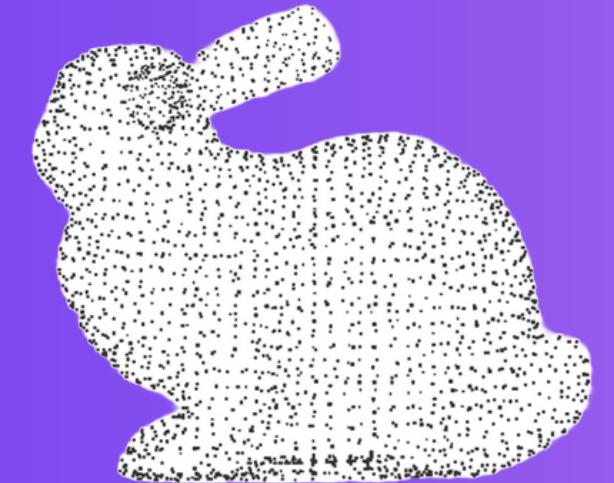


Purpose:

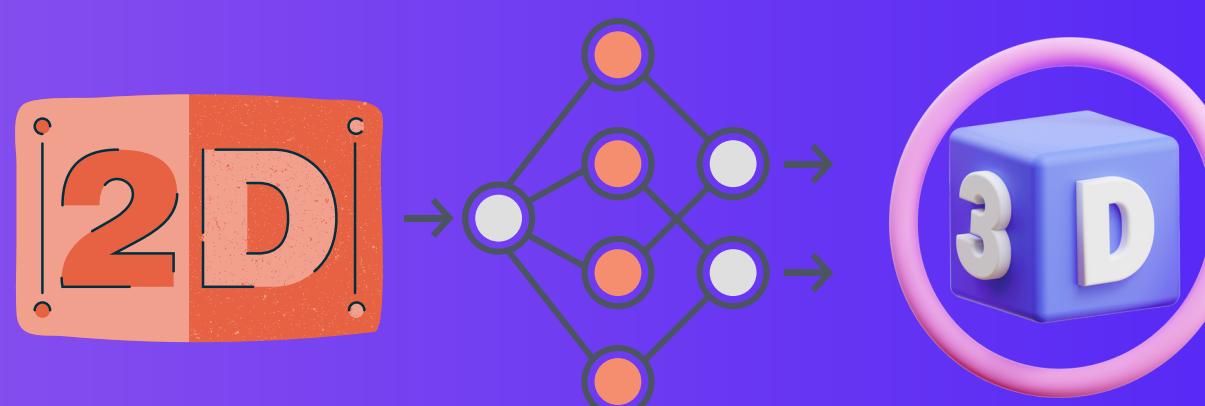
Analyzing 3D point cloud data
(Geometric Information)

Output Format

- 3D Classification
- Segmentation



Process:



3D Point Cloud

Applications

- Object classification
- Segmentation

2018

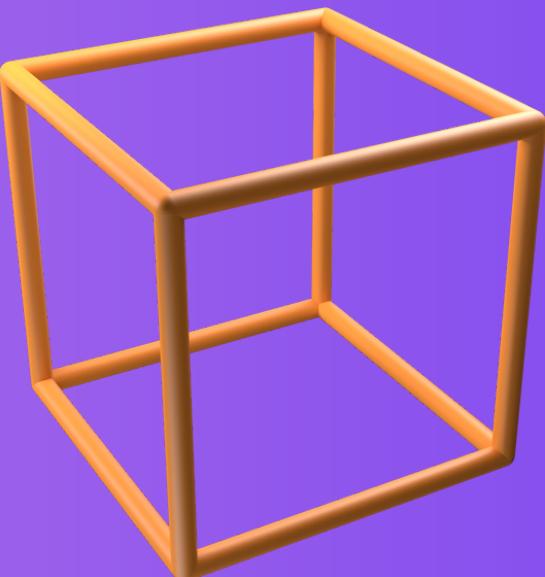
DEEPMVOXELS: LEARNING PERSISTENT 3D FEATURE EMBEDDINGS



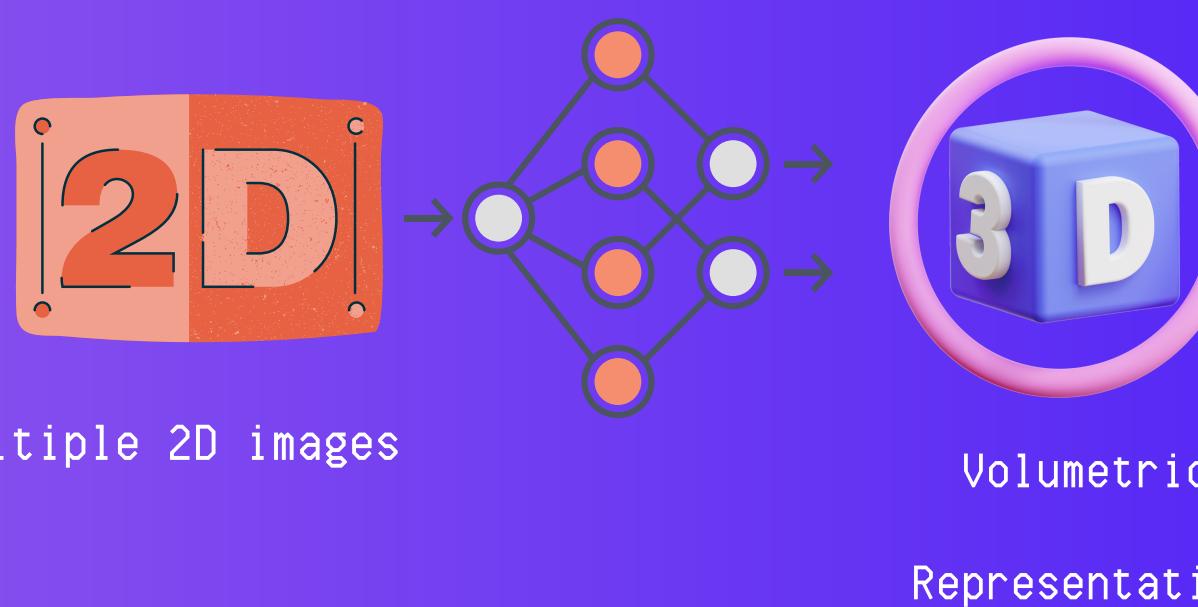
Authors: Zhengqi Li, Noah Snavely, Daniel Tarlow

Purpose:

3D object reconstruction

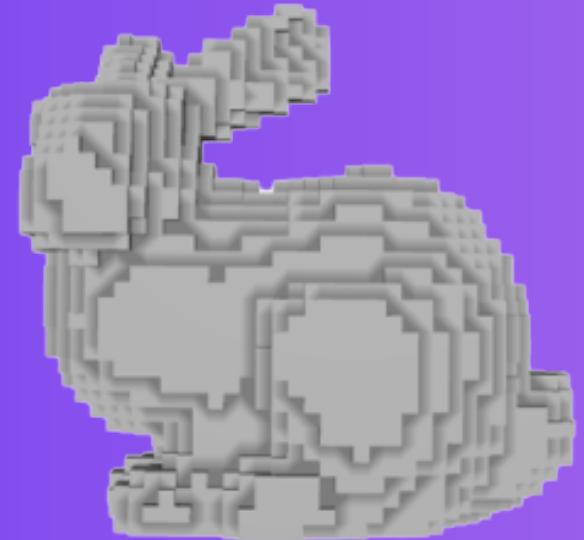


Process:



Output Format

- Geometric Information
- Semantic Information



Applications

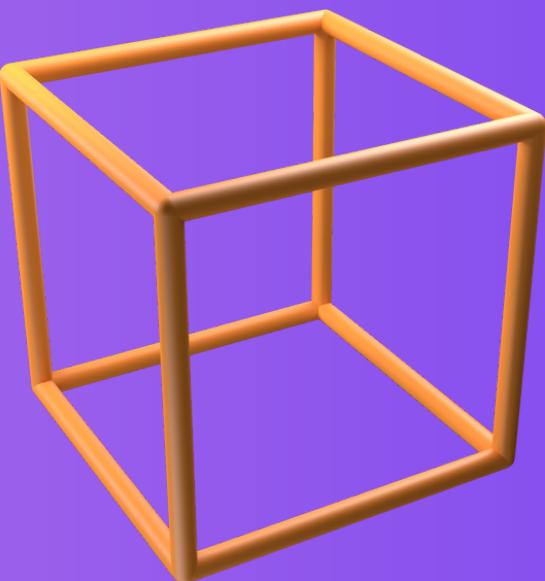
- 3D scene reconstruction
- object recognition
- object pose estimation.

2018

PIXEL2MESH: GENERATING 3D MESH MODELS FROM SINGLE RGB IMAGES



Authors: Nanyang Wang, Yinda Zhang, Zhuwen Li, Yanwei Fu, Wei Liu, Yu-Gang Jiang

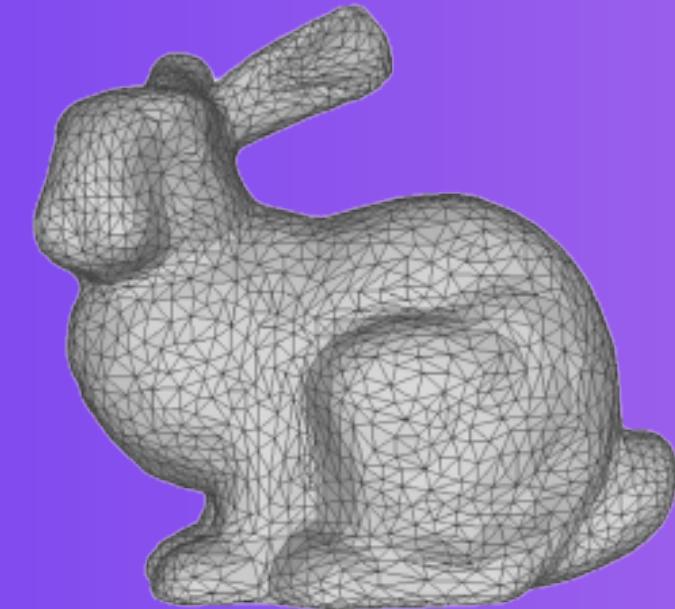


Purpose:

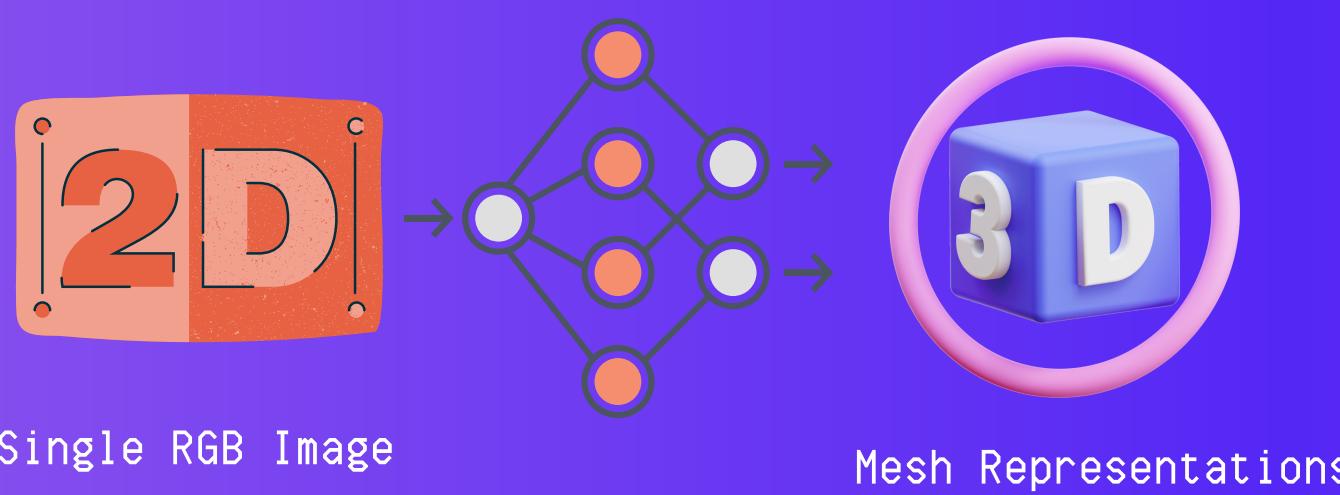
3D mesh models from single RGB images

Output Format

- Vertices
- Edges
- Mapping



Process:



Applications

- Computer Graphics
- 3D Modeling

PIFuHD

(Pixel-Aligned Implicit Function for High-Resolution 3D Human Digitization).

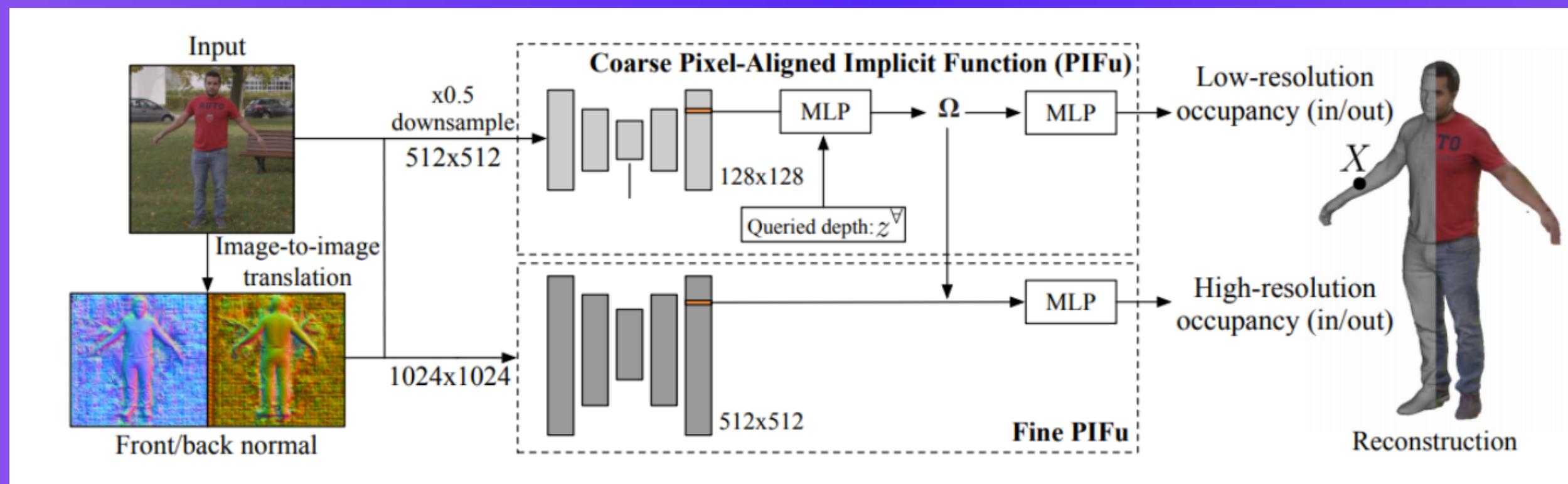
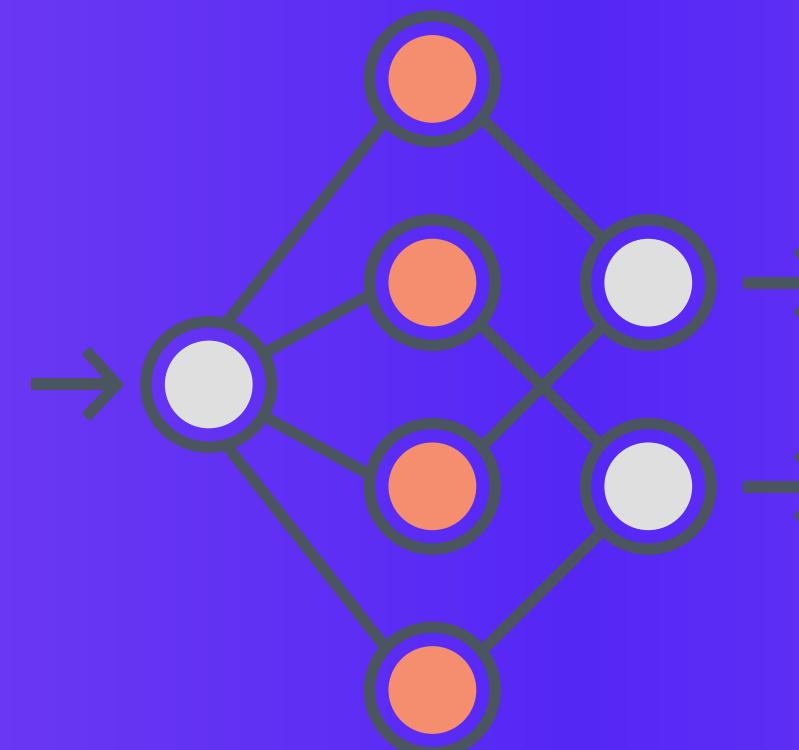
- Data Collection and preprocessing
- Network Architecture
 - Backbone
 - PiFu
 - Refinement
- Training
- Interface Conversion
- Post-Processing

Process:

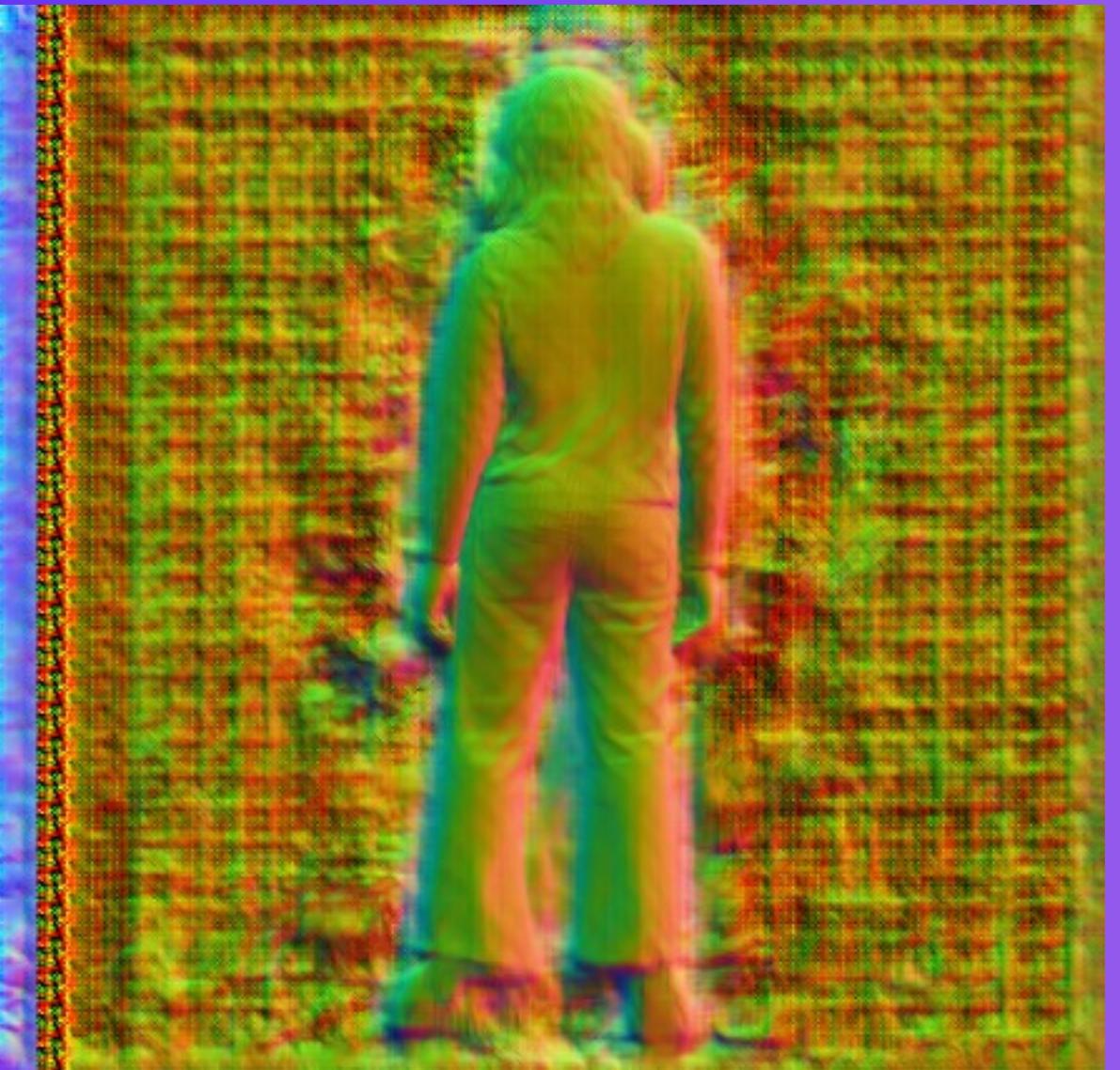
Dimension

Matrix

MLP



RESULT



RESULT



THANK YOU!

