

Stereo Vision & Point Clouds



Learning Objectives

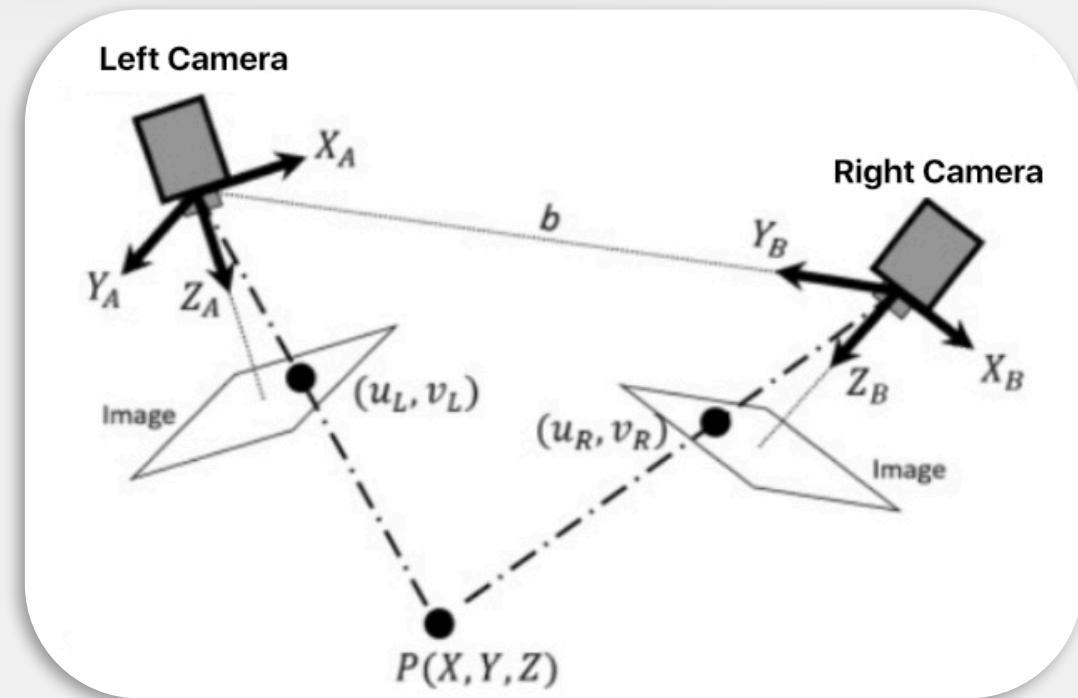
- **Stereo Vision**
- **Point Cloud**
- **Stereo Vision and 3D Sensing**
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 - **Stereo Vision for 3D Reconstruction**
 - **Stereo Point Cloud Generation**
 - **High-Quality Dense 3D Point Clouds with Active Stereo**
- **Summary**
- **References**



Stereo Vision

Introduction

- Is the process of extracting 3D information from digital images
- Obtained by a CCD Camera
- Technique for computing depth information based on images



Stereo Vision

Introduction



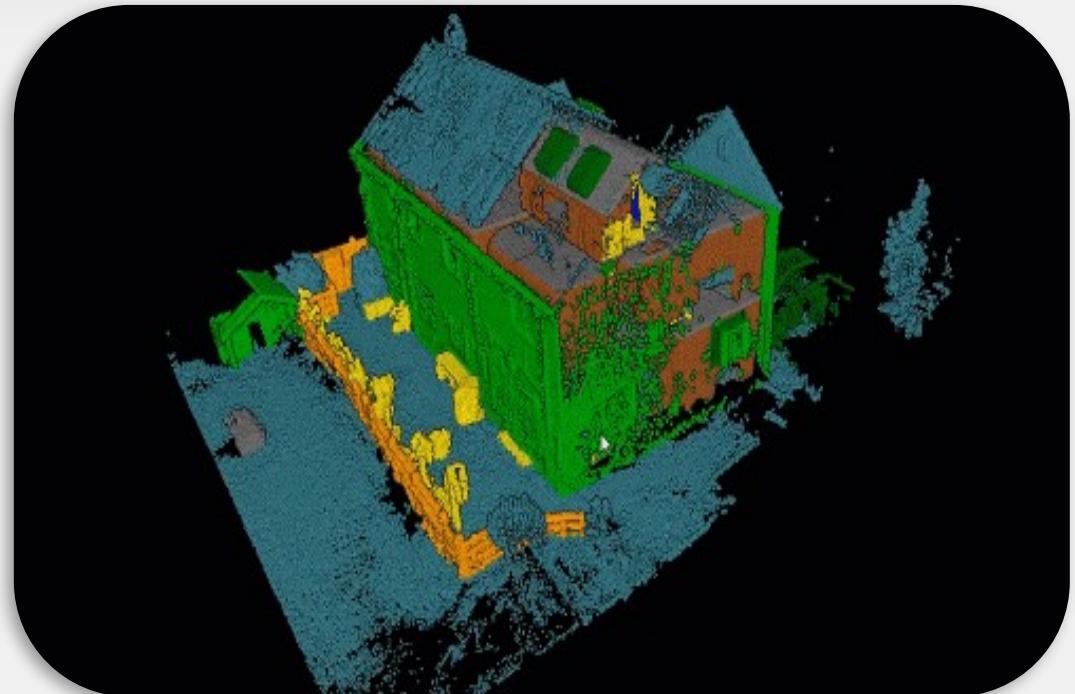
- Machine learning vision algorithm that actively determines the **position** of localized objects.
- Visual perception process that exploits two different views to achieve **depth perception**.



Point cloud

Introduction

- Set of points in cloud
- Points maybe in 3D shape or objects
- Generally produced by 3D Scanner or by Photogrammetry software



Stereo Vision & 3D Sensing



- It uses two cameras
- Separated by baseline
- Two images are captured to analyze for the difference b/w images
- Specifically, identifying the same pixels in both images

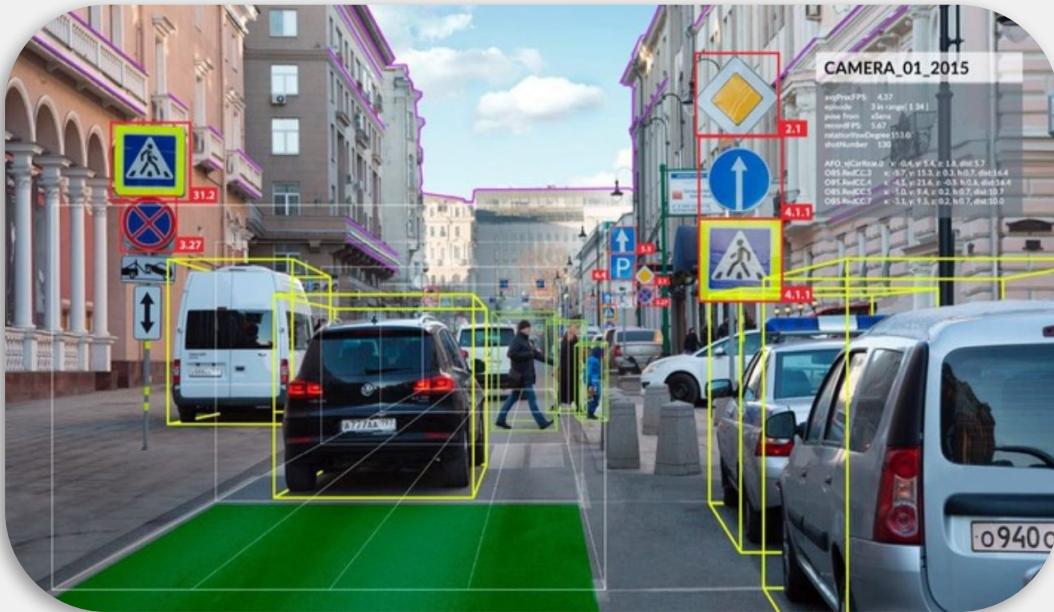
Stereo Vision for 3D Reconstruction



Stereo Vision Based Tesla Video



High Quality Dense 3D Point Cloud



- Structured Light & Active Stereo (Multi-Frame)
 - Deliver High Accuracy
 - 3D Data at Short Range
 - Demonstrates 3D Measurement System

Summary

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- **High-Quality Dense 3D Point Clouds with Active Stereo**



Links

- Stereo Vision

<http://github.com/kanwasinglaa/StereoVision>

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- Point Clouds

<https://medium.com/analytics-vidhya/depth-sensing-and-3d-reconstruction-512ed121aa60>



THANK YOU!

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