UST Global Internship ETRI-ICT Laboratory

ETRI
한국전자통신연구원
Electronics and Telecommunications Research Institute

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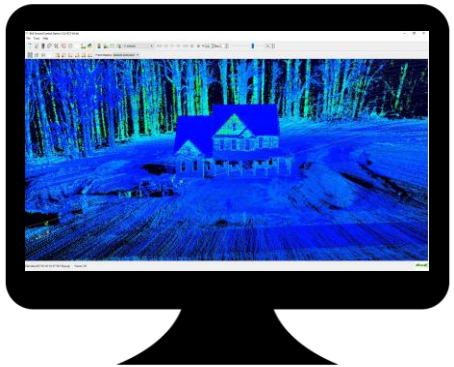
CONTENTS

INTRODUCTION

Laser Radars are used for scanning the surroundings and providing 3D representation of the scanned area

In order to scan and visualize the surroundings Laser Radar's or LIDARs consist of 2 parts:

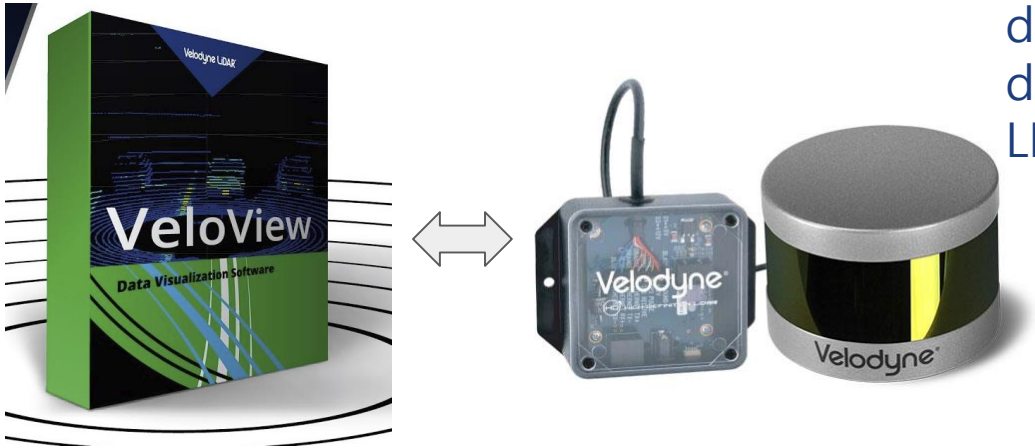
1. LIDAR itself
2. Software to visualize it



INTRODUCTION

Issue: The Software developed to visualize data from ETRI-STUD LIDAR has issues

Solution: Use open source software for visualization



VeloView is open source software developed by Kitware to visualize data received from Velodyne LIDARs

However, Velodyne LIDARs data packet is different from ETRI-STUD LIDAR packet, which makes us unable to use it directly

Packet Differences

Velodyne LIDAR(VLP-16)

- rotational
- azimuth for calculating 3D points
- multiple number of lasers (16)
- tail bytes are used for timestamp and identification

ETRI-STUD LIDAR

- stationary
- no need for azimuth
- single laser
- tail bytes are used for frame counting and identification

REQUIREMENTS AND PROCESS

Task: In order to visualize the data from ETRI-STUD LIDAR the source code of VeloView must be modified and adapt to packets with different data structure

RESEARCH PLAN

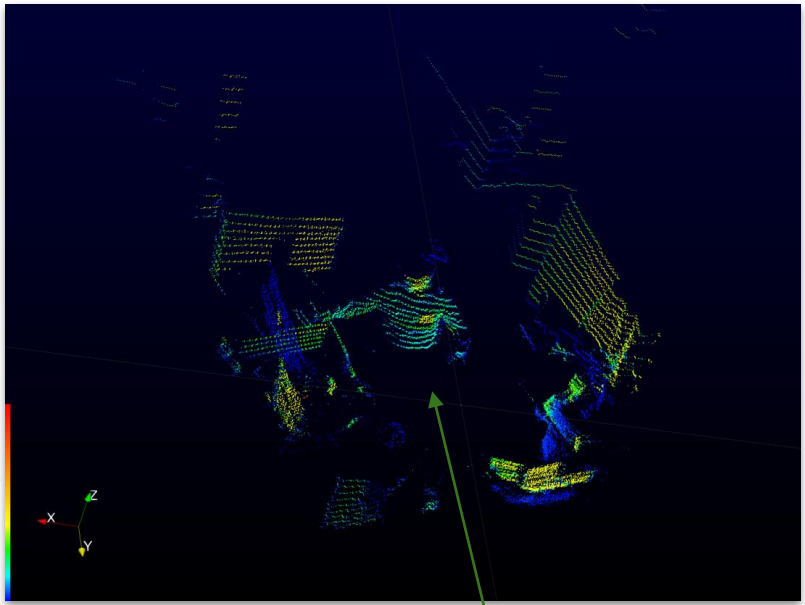
Compile	Visualize	Analyze	Modify	Visualize
Compile the source code to check if it works	Connect to VLP-16 and visualize to check if it works correctly	Analyze the code and find the part responsible for packet	Modify the required functions to adapt to ETRI-STUD LIDAR	Visualize ETRI-STUD LIDAR data

Compile → Visualize

Instructions:

- Set environment
- Compile
- Run
- Visualize

VLP-16



M
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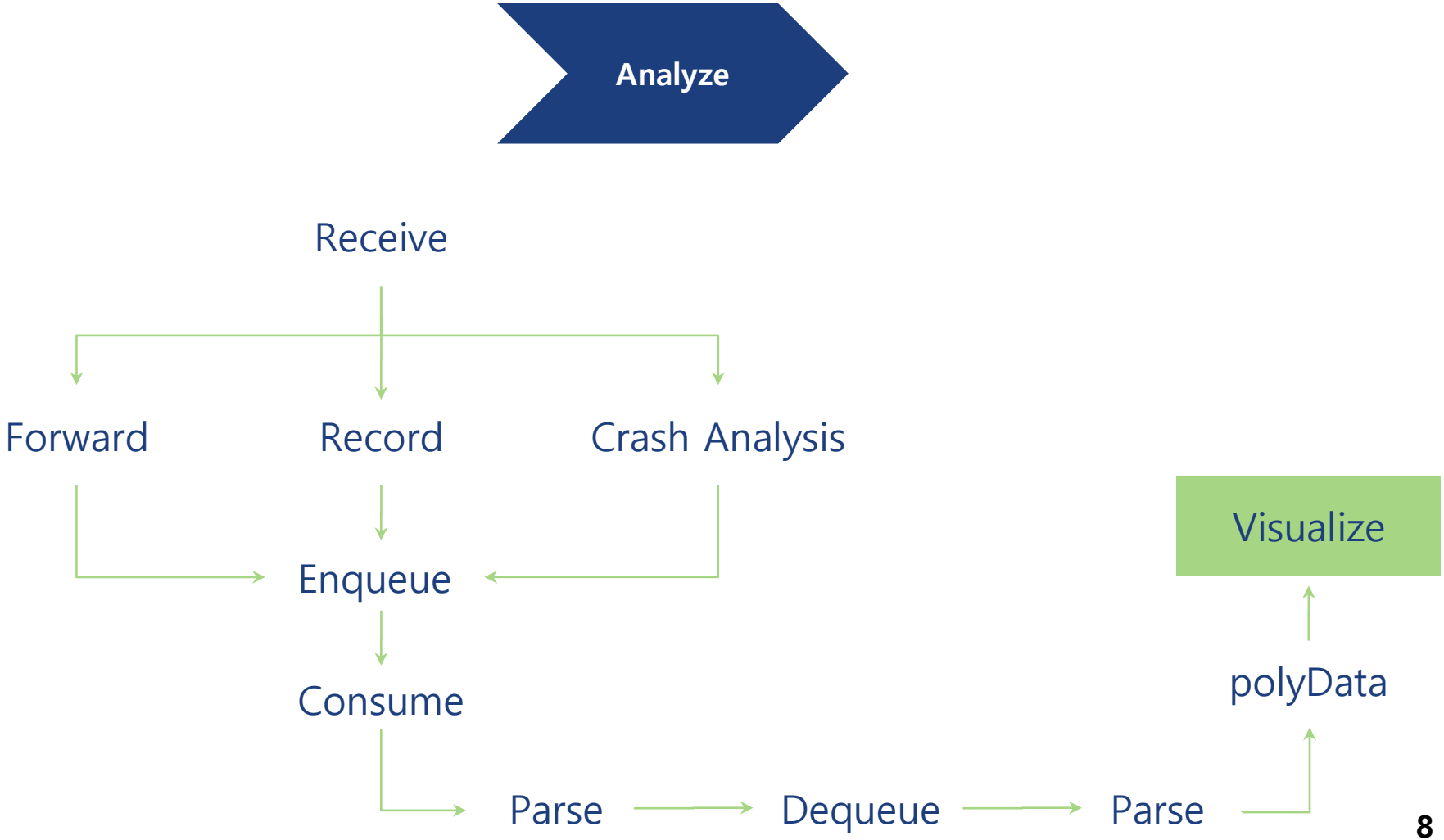

Analyze
Receive
Forward
Record
Crash Analysis
Enqueue
Consume
Parse
Dequeue
Parse
polyData
Visualize

Modify:

- The algorithm for computing the 3D coordinates was designed and implemented
- The software adapted to interpret the data of ETRI-STUD LIDAR

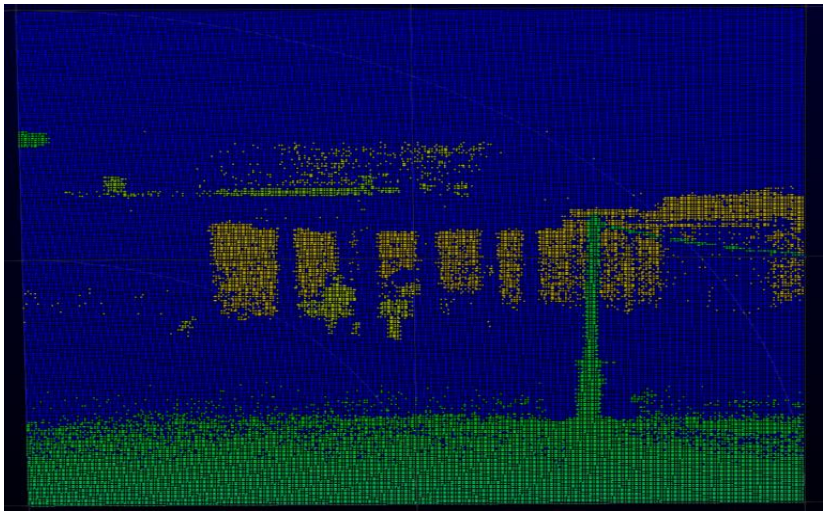
Visualize:

- Below are the photographic and scanned returns

Modify Visualize

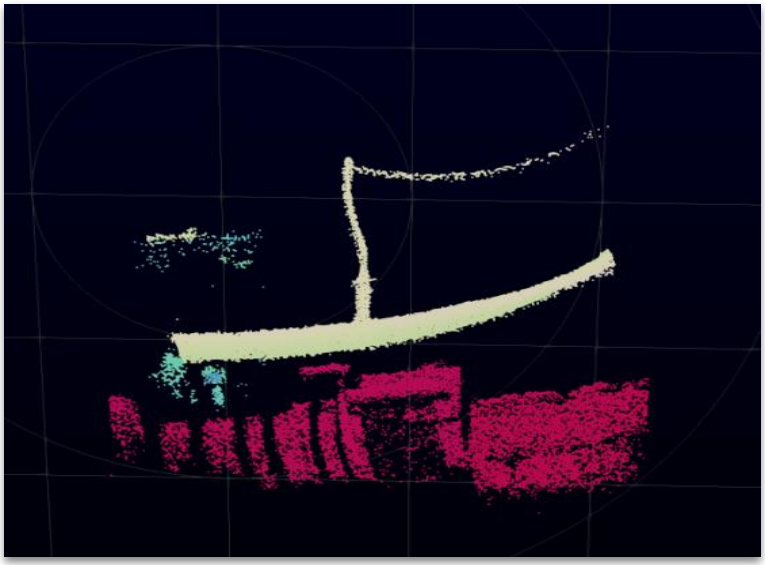
Photo

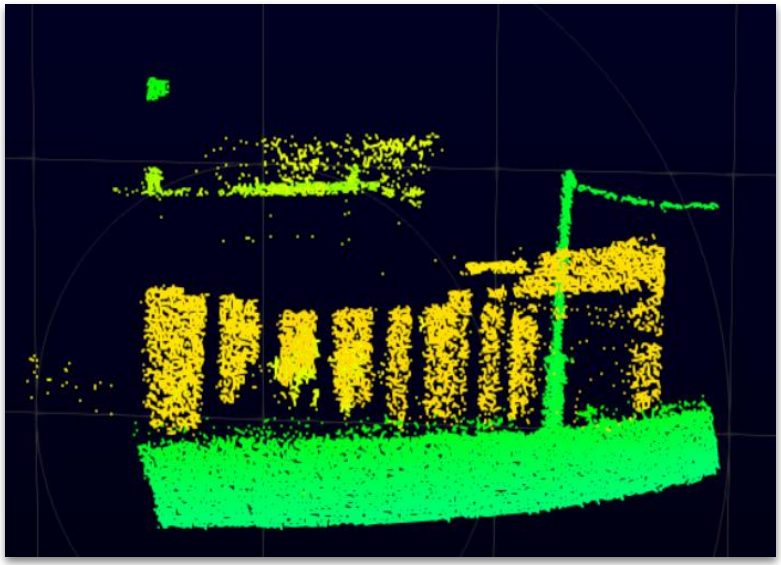
Obtained



Video playable, color mapped and 3D

https://youtu.be/cgWKWJbDL2s





CONCLUSION

All the requirements are met, the software is adapted to interpret ETRI-STUD LIDAR data

Special thanks to UST for opportunity, my lab mates for warm attitude and professor Bongki Mheen for thorough inspection of my progress, answering my questions and making sure I am focused well

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Q & A