

# Extending the Web-based VR Tours Framework: Automated Location

## Map Generation from LiDAR Data

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### Background

After reading Professor's papers on web-based VR Tours Framework, I recognized the existing framework's current limitation in automatically generating location maps was noted as a key area for future development. Inspired by this, this research plan proposed to extend the framework by focusing on automating this specific functionality on Point Cloud Data (PCD). PCD can be transformed from LiDAR sensor data, then can provide a wealth of experimental data for development and evaluation.

### Proposed Plan

The research will begin with an in-depth study of the VR Tours Framework, focusing on its PCD handling components and particularly how it currently processes PCD for location map generation. The PCD can be converted through from LiDAR sensor data, then the process of converting data could be integrated into the framework, and there is relevant existing research available for the convert process.<sup>3</sup> Subsequently, deep learning models can be used to process acquired PCD data, extracting features that enable the effective use of the framework's existing components for generating VR maps.

### Expected Contributions

An extension to the web-based VR Tour Framework to automate location map generation by integrating data process from LiDAR sensor and deep learning model, contributing to reduced manual effort in location map generation.

### Reference

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2. Y. Okada, W. Shi and K. Kaneko, "Web Service for VR Tours of 360VR Images/Videos Using OpenVSLAM Server," 2024 IEEE International Conference on Consumer Electronics-Asia (ICCE-Asia), Danang, Vietnam, 2024, pp. 1-4, doi: 10.1109/ICCE-Asia63397.2024.10773996.
3. Hyounghwon Chang, Yanlei Gu, Igor Goncharenko, Li-Ta Hsu, Chinthaka

Premachandra, "Cyclist Orientation Estimation Using LiDAR Data", Sensors, Vol. 23, No. 6, pp. 1-15, 2023.