Imperial College London

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Weekly Meeting

Week 6

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Segmentation Progress

Tools

- Laspy
- Segment lidar : samlidar
- CloudCompare

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Result

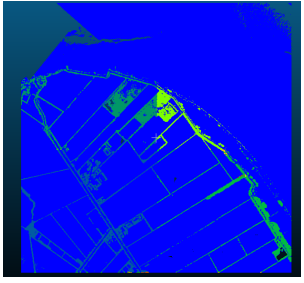

Figure 1: Segmented-LiDAR (Open with CLoudCompare)

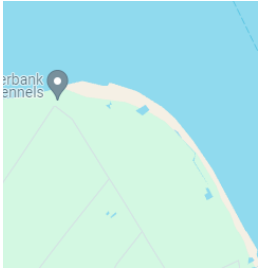

Figure 2: Location (source: Google Maps

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LiDAR Data Update

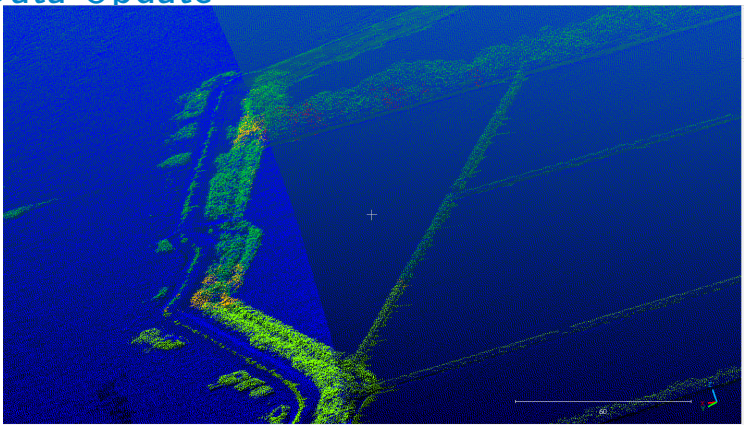

Figure 3: Segmented-LiDAR (Open with CLoudCompare)

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Data Normalisation

Min-Max Normalisation [1]

This linearly transforms data to fit the interval [0,1]

$$\tilde{x}_i = \frac{x_i - x_{min}}{x_{max} - x_{min}}. \tag{1}$$

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Data Normalisation

L2 Normalisation [1]

L2 norm is the square root of the sum of the entries of the vector

$$\begin{aligned} \|x\|_1 &= \sum |x_i| \\ \|x\|_2 &= \sqrt{\sum x_i^2} \\ \|x\|_p &= (\sum |x_i|^p)^{1/p} \end{aligned} \tag{2}$$

Classification

State-of-the-art: Decision Tree [1]

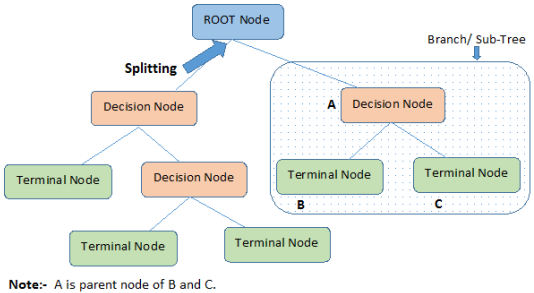

Figure 4: Decision Tree Illustration

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To Do List

- Deep Learning : concept of neural network
- K-Nearest Neighbours
- Random Forest Classifier
- Point Cloud Segmentation
- etc.

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Reference

[1] Nicholas Arnold et al. "Automatic extraction and labelling of memorial objects from 3D point clouds". In: *Journal of Computer Applications in Archaeology* 4.1 (2021).