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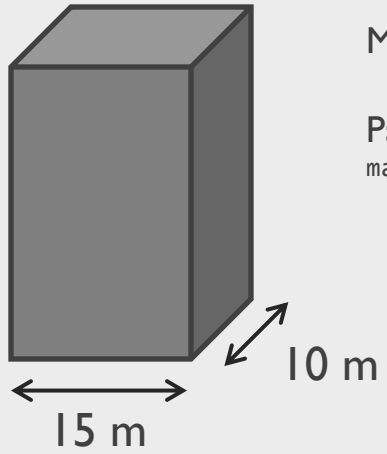
先端技術開発課

Max Window Size

The maximum window size has to be greater than the largest objects (X or Y) in the experimental area.



Largest building

Max window size > 15

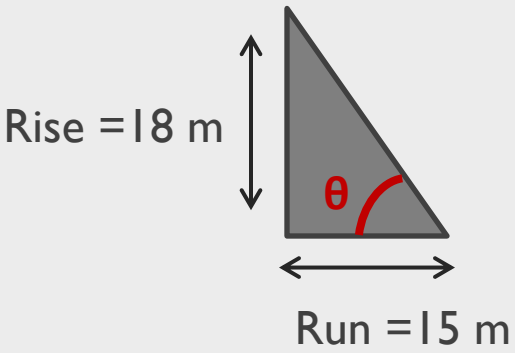
Parameters txt:

```
max_window_size 16
```

Type: int
Range: 3(Linear) or 5(Exponential) - …
Default: 33

Slope

The terrain slope = $\tan\theta = \frac{elevation\ between\ two\ points}{distance\ between\ two\ points} = \frac{rise}{run}$



Slope = 18/15 = 1.2

Parameters txt:

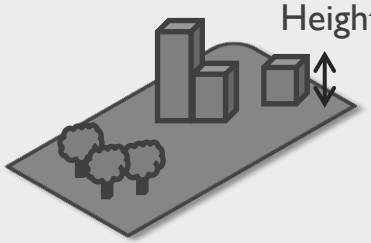
```
slope 1.2
```

Type: float
Range: 0.0 – (1.5)
Default: 0.7

θ	Slope
0.6°	0.01
1°	0.017
1.15°	0.02
1.19°	0.0208
2.86°	0.05
4.76°	0.083
7.13°	0.125
10°	0.176
14.04°	0.25
15°	0.268
26.57°	0.5
30°	0.577
45°	1
56.31°	1.5
60°	1.732
63.43°	2
78.69°	5
89.43°	10
90°	inf.

Max Distance

The maximum elevation difference threshold



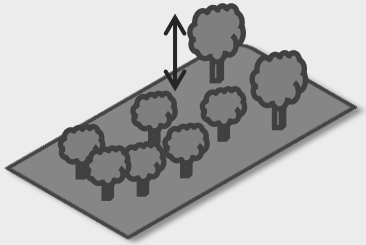
Height = 5 m

Max Distance < 5.0 = 4.9

Parameters txt:
`max_distance 4.9`

Type: float
Range: (0.0) – (115.7) [m]
Default: 10.0

Buildings area: FIXED
Max Distance has to be less than the lowest building height



Height = 15 m

Max Distance ~15 = 16.0

Parameters txt:
`max_distance 16.0`

Forest area: NOT FIXED
Max Distance is usually set as the largest elevation difference threshold

Initial Distance

The initial elevation difference threshold

Type: float
Range: (0.00) – (1.00) [m]
Default: 0.15

Initial Distance ~ 15 cm

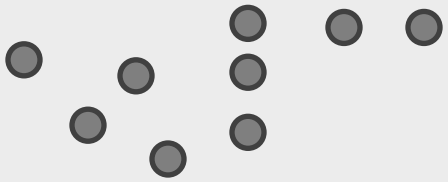
Parameters txt:

```
initial_distance 0.15
```

Usually set to a very small value. Approximately equal to the LIDAR measurement error.

Cell Size

Grid cell size



Average Spacing between points = 0.44

Cell Size < 0.44 / 2 = 0.2

Parameters txt:

```
cell_size 0.2
```

Type: float
Range: (0.0) – (10.0) [m]
Default: 1.0

To preserve most of the original points, we choose the cell size to be about two times less than the average spacing between points

Exponential

Way to increase the window size

$w_k = 2b^k + 1$

Exponential = True

Parameters txt:
`exponential true`

Type: bool
Range: true / false
Default: true

EXPONENTIAL:
Saves computational time

$w_k = 2kb + 1$

Exponential = False

Parameters txt:
`exponential false`

LINEAR:
Gradually changing topographic features are well preserved

Base

The radius of the initial window size

$$w_k = 2b^k + 1$$
$$b = 2; w = 5, 9, 17, 33 \ldots$$

Base = 2.0

Parameters txt:
`base 2.0`

Type: float
Range: (0.0) – (10.0)
Default: 2.0

EXPONENTIAL:
Base usually set to 2.0

$$w_k = 2kb + 1$$
$$b = 1; w = 3, 5, 7, 9, \ldots$$

Base = 1.0

Parameters txt:
`base 1.0`

LINEAR:
Base usually set to 1.0