

```
C:\Windows\system32\cmd.exe - D:\C++code\test2\feature_point_extraction.exe D:\C++code\test2\data\ fandisk
Microsoft Windows [版本 10.0.18362.356]
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C:\Users\DELL>D:\C++code\test2\feature_point_extraction.exe D:\C++code\test2\data\ fandisk
Failed to find match for field 'intensity'.
Failed to find match for field 'curvature'.
Please input the neighborhood radius, Volatility Analysis Threshold and curvature difference threshold for initial feature point extraction!
0.06 0.015 0.002
Please input the shrinkage radius used in shrinkage optimization and the grid length in voxel simplification!
0.06 0.06
Please enter the number of iterations, iteration step size!
50 0.002
请按任意键继续. . .
```

Run:

feature_line_extraction.exe data path filename

Input: Point cloud with its filtered normal (in a PLY format)

Output:

fandisk_final_feature_point.ply

fandisk_final_feature_point_downsample.ply is a down-sampled version.

Parameter explanation:

- **Neighborhood radius:** Determine a neighborhood for initial feature point detection,
- **Volatility Analysis Threshold:** The threshold used to measure surface variation.
- **Curvature difference threshold:** The threshold used to measure the curvature difference.
- **The radius used in shrinkage optimization:** Neighborhood radius used in iterative contraction.
- **The grid length:** Down sampling density for voxel simplification.
- **The number of iterations:** Number of iterations for iterative optimization.
- **Iteration step size:** The iteration step size of the gradient descent algorithm.

Note:

Only support the point cloud with “PLY” format

Some parameters are hardly-coded in our code, although they occur in our paper.

Please cite our work:

@article{chen2021multiscale,

title={Multiscale Feature Line Extraction From Raw Point Clouds Based on Local Surface Variation and Anisotropic Contraction},

author={Chen, Honghua and Huang, Yaoran and Xie, Qian and Liu, Yuanpeng and Zhang, Yuan and Wei, Mingqiang and Wang, Jun},

journal={IEEE Transactions on Automation Science and Engineering},

year={2021},

publisher={IEEE}

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