

# points-calc: fast processing of extremums and percentile values in point cloud

`points-calc nearest-(min/max)` and `percentile` operations search within a given radius around each input point. This can take a lot of time for large amount of input data.

One way to speed things up is to, instead of finding the nearest min to each point in a given radius, find the minimum for the 27 voxels in the neighbourhood of the voxel containing the point. That computed value is assigned to each point in that voxel.

This optimization is used when `points-calc nearest-(min/max)` or `points-calc percentile` is given `--fast` command line argument. For example

```
> points-calc nearest-min --full --fast --fields x,y,scalar --radius 1
> points-calc percentile --percentile=0.03 --fast --fields x,y,scalar --radius 1
```

On large point cloud, like that of rose street ([http://perception.acfr.usyd.edu.au/data/samples/riegl/rose.st/rose.st.\\*.csv.gz](http://perception.acfr.usyd.edu.au/data/samples/riegl/rose.st/rose.st.*.csv.gz)), optimized operations were found to be 20 times faster for extremums and more than 100 time faster for percentiles.