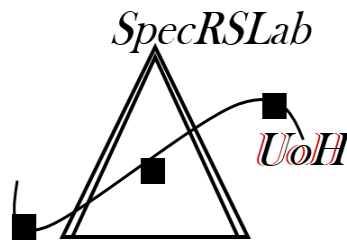


אופטימיזציה לקונפיגורציות סריקה מנתוני לייזר מוטס (Airborne LiDAR) בהתאם לתנאי השטח

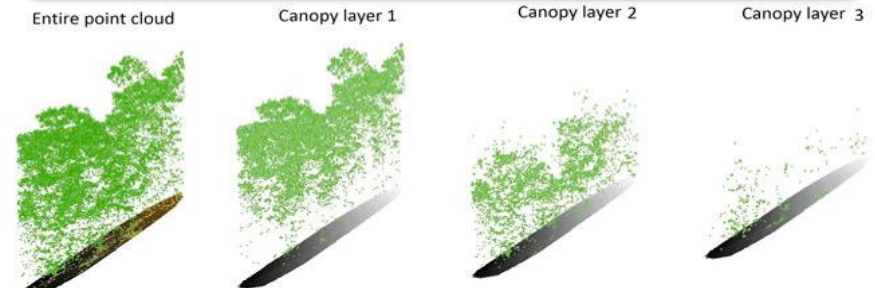
קרן סלינס, ד"ר דן מלקינסון, ד"ר אנה ברוק



Light Detection And Ranging (LiDAR)

- *Remote Sensing Technology*
- *A **laser sensor** that measures **distance** and **precise location** of an object*
- *GPS (x y z), inertial measurement units (IMU), computer-> **Point cloud***
- *Satellite, an airborne LiDAR and Tripod*
- *Advantages:*
 - ***Fast** data collection with high **accuracy***
 - ***High sample density** comparing to photogrammetry*
 - *LiDAR sensor is not affected by **geometrical distortions** (angular landscapes)*
 - *map the **densely forested** areas*
 - ***Digital elevation model (DEM)***
 - ***Digital terrain model (DTM)***

Tree canopy segmentation



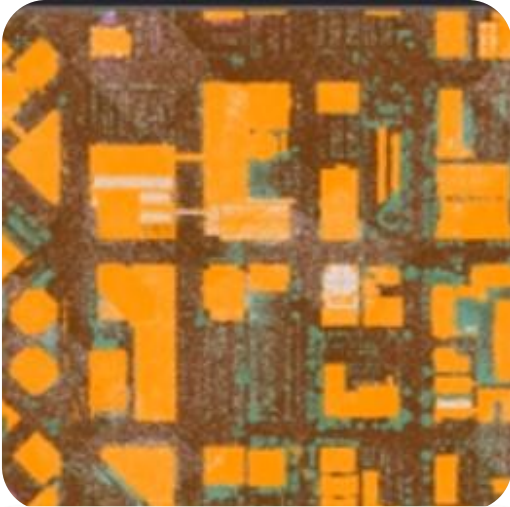
*<https://www.nature.com/articles/s41598-017-07200-0#Abs1>

*<http://lidarradar.com/info/advantages-and-disadvantages-of-lidar>

Light Detection And Ranging (LiDAR)

- Used to :
 - *Locate topographic features*
 - *Define feature geometries*
 - *Create 3D surface*

Theme point cloud



Classification
Vegetation ,Buildings



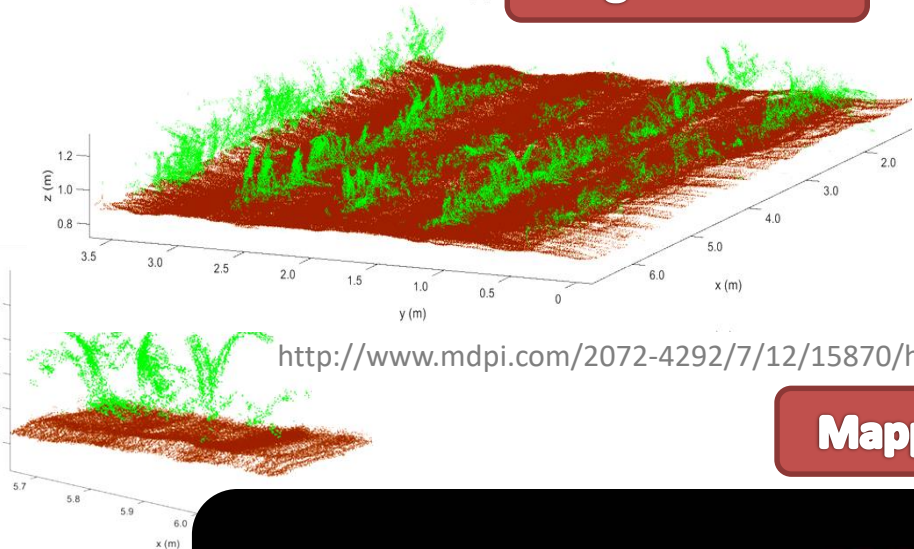
Elevation



Intensity values

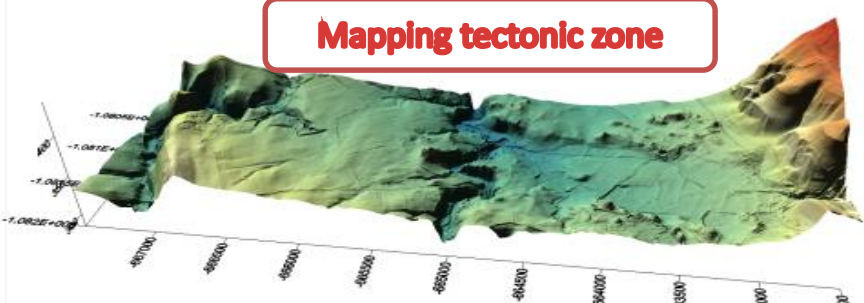
Point cloud for 3D surfaces

Agriculture



<http://www.mdpi.com/2072-4292/7/12/15870/htm>

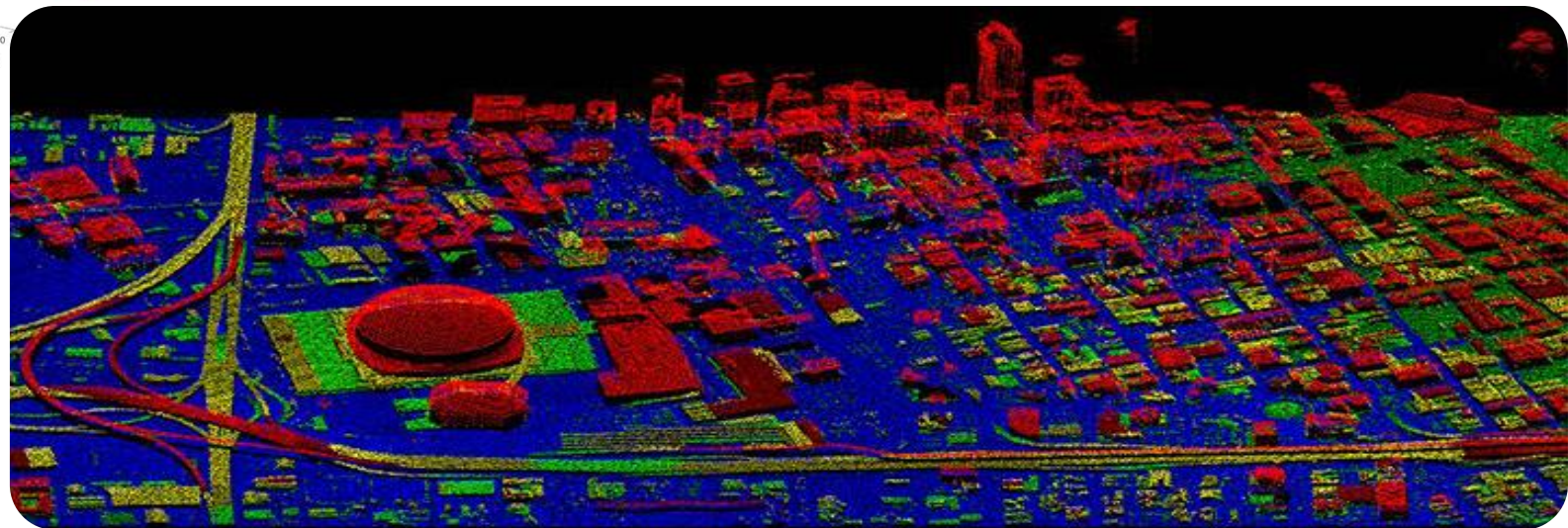
Geology



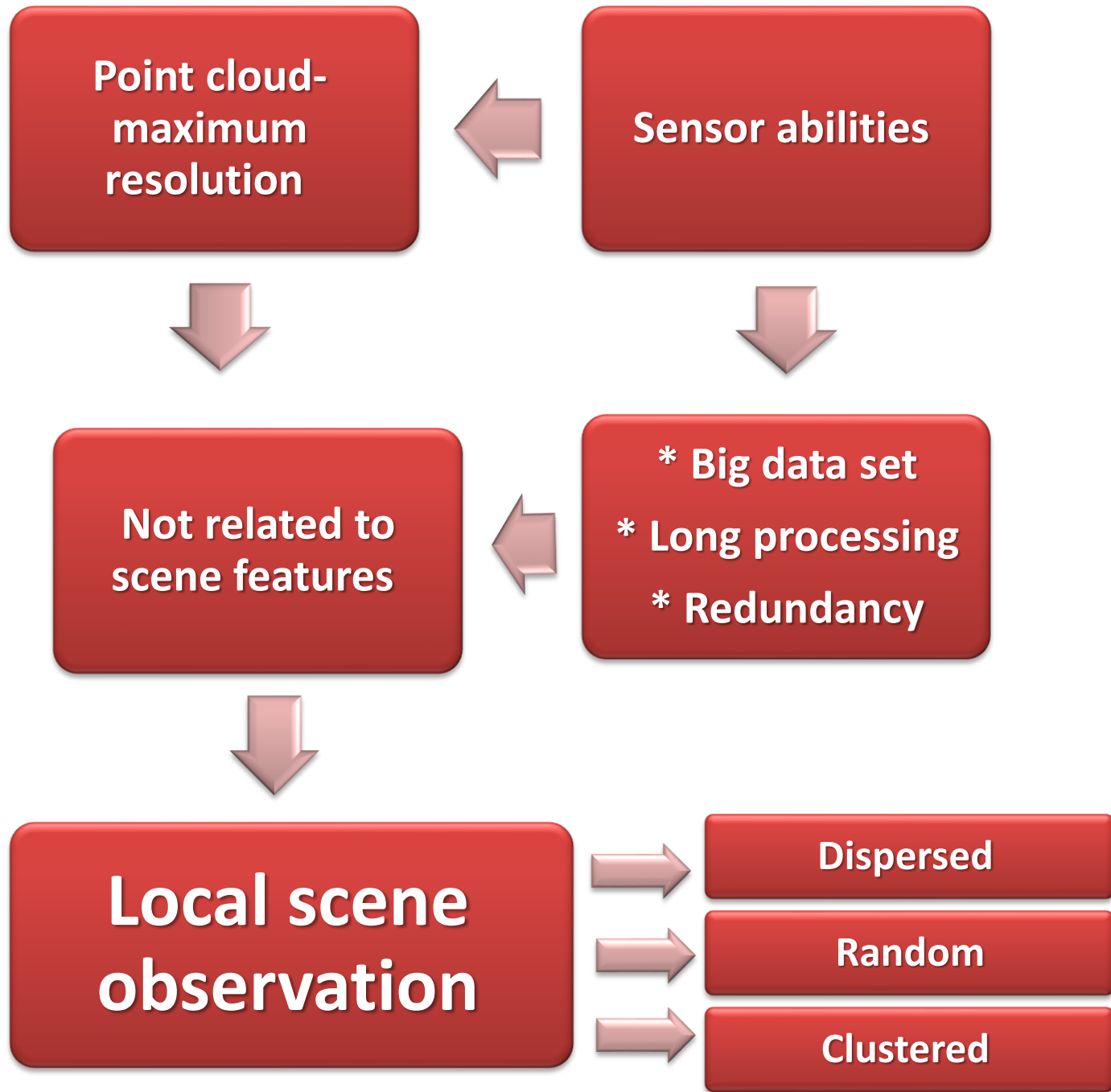
Mapping tectonic zone

<http://www.mdpi.com/2072-4292/7/12/15870/htm>

Mapping buildings



<https://eros.usgs.gov/topographic-research/structures>



Point cloud-
maximum
resolution

Sensor abilities

Not related to
scene features

- * Big data set
- * Long processing
- * Redundancy

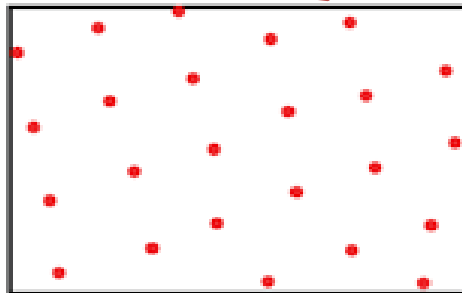
Local scene
observation

Dispersed

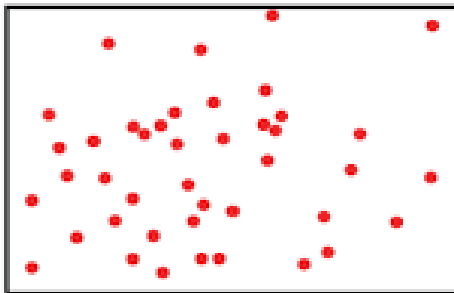
Random

Clustered

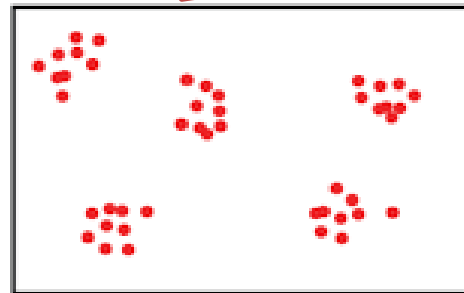
Setting a threshold for minimal resolution for each



Uniform dispersion

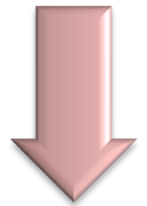


Random dispersion

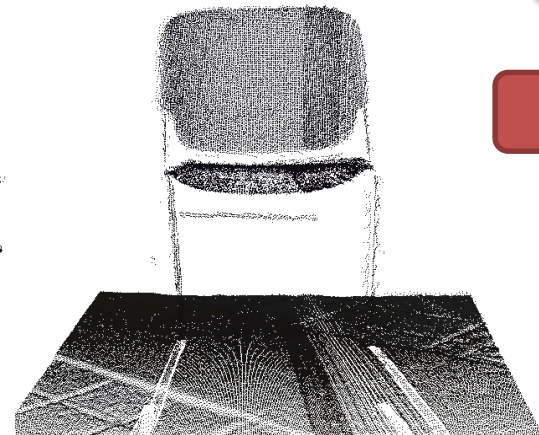
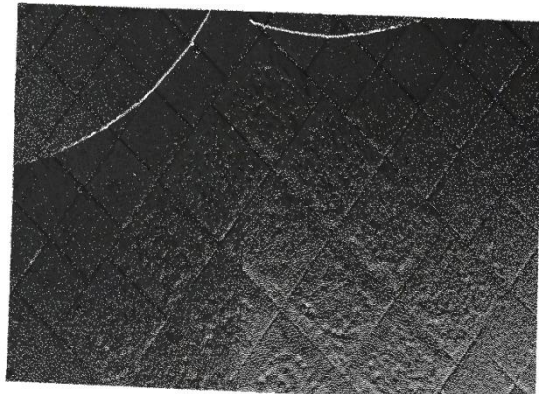


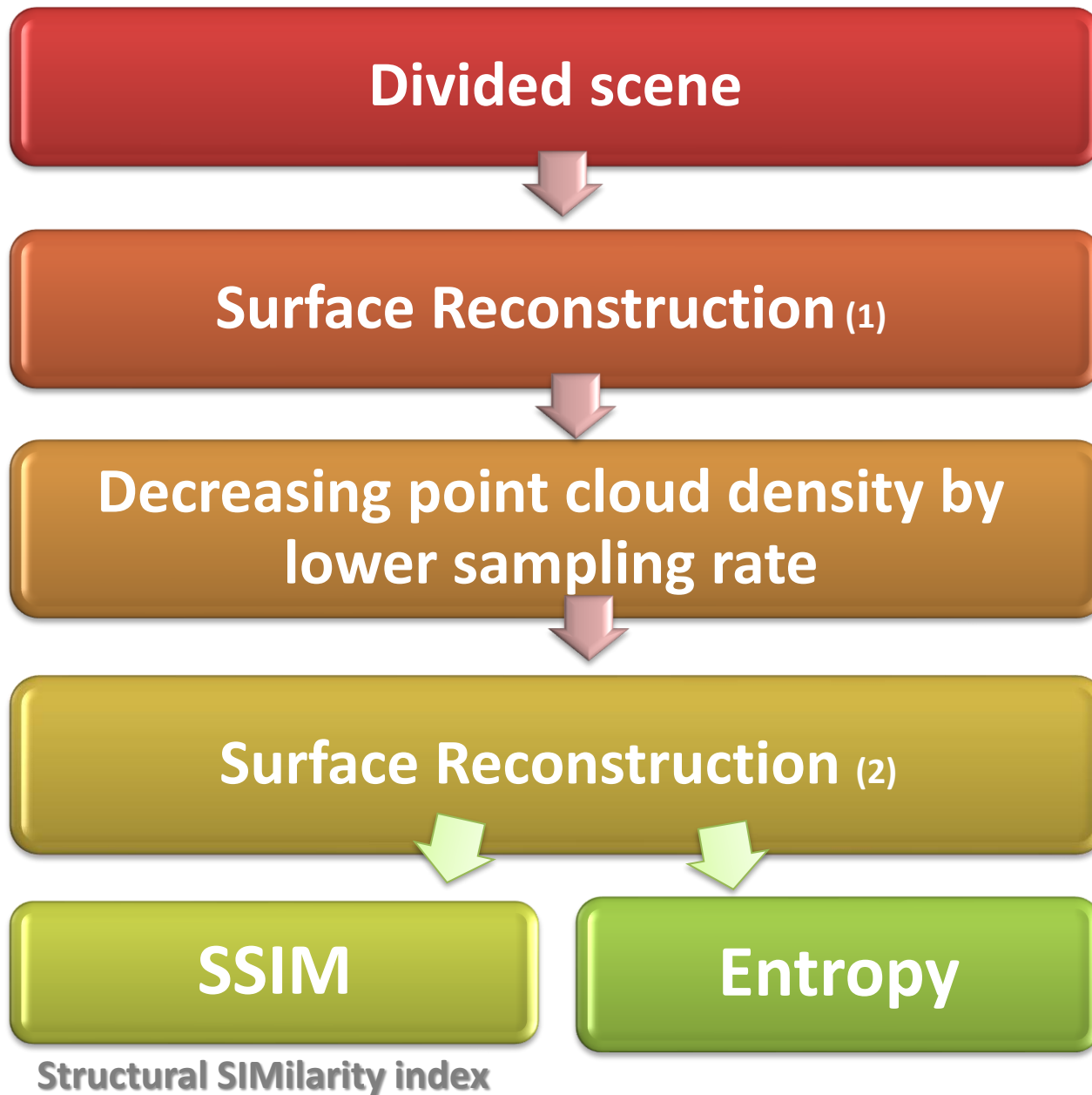
Clumped dispersion

2D

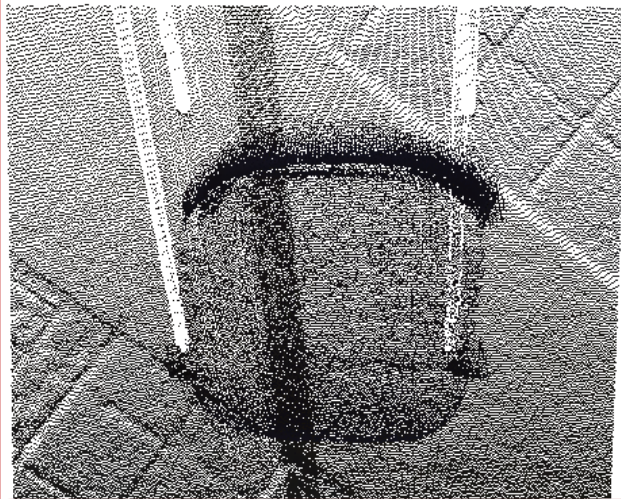
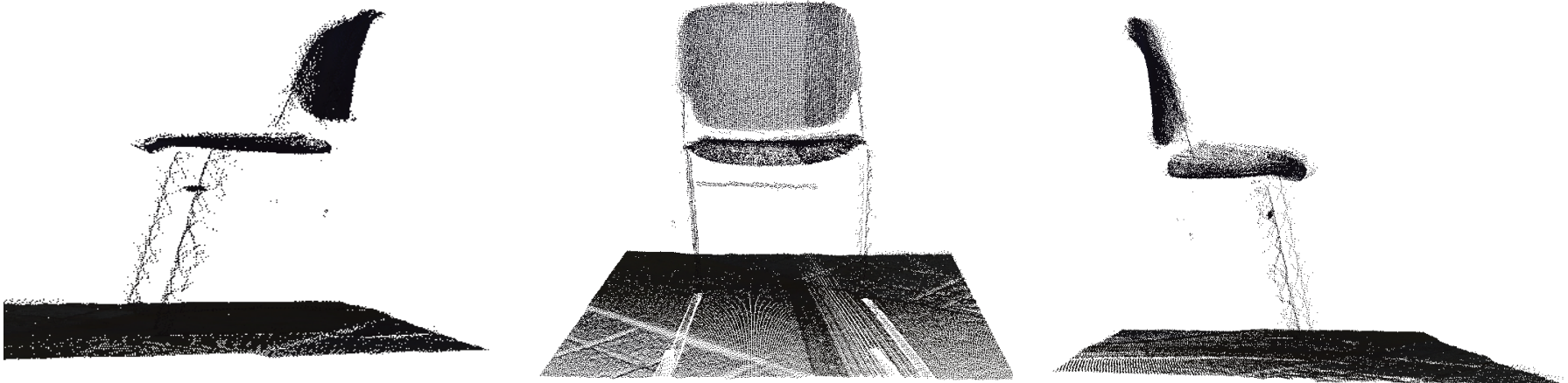


3D





Clustered point cloud



point of view

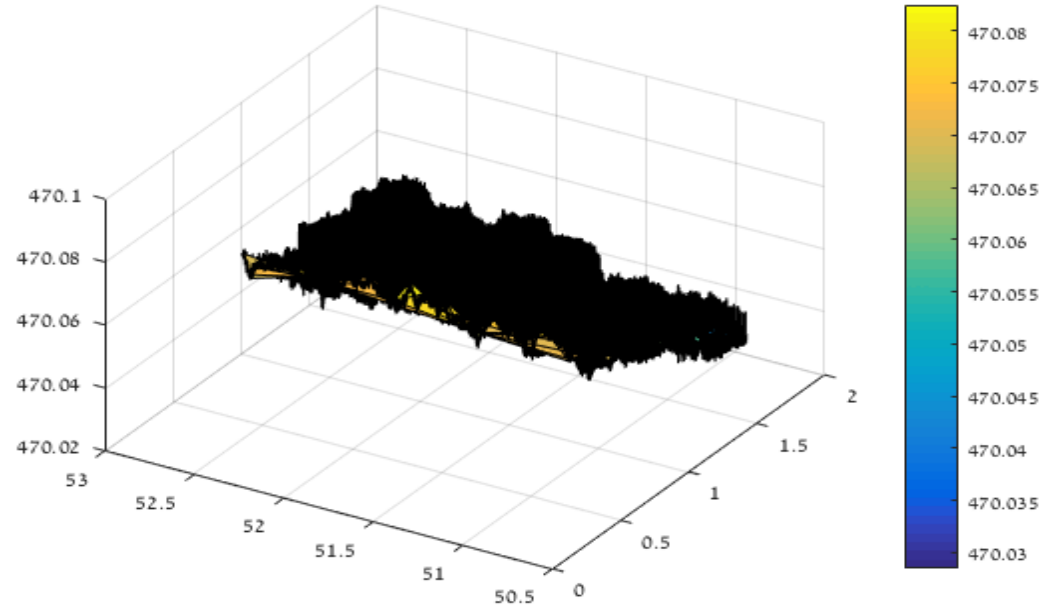
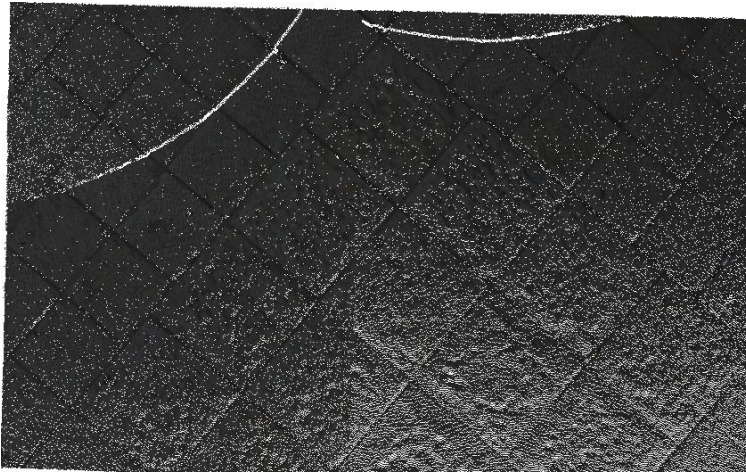
Nadir

Random point cloud

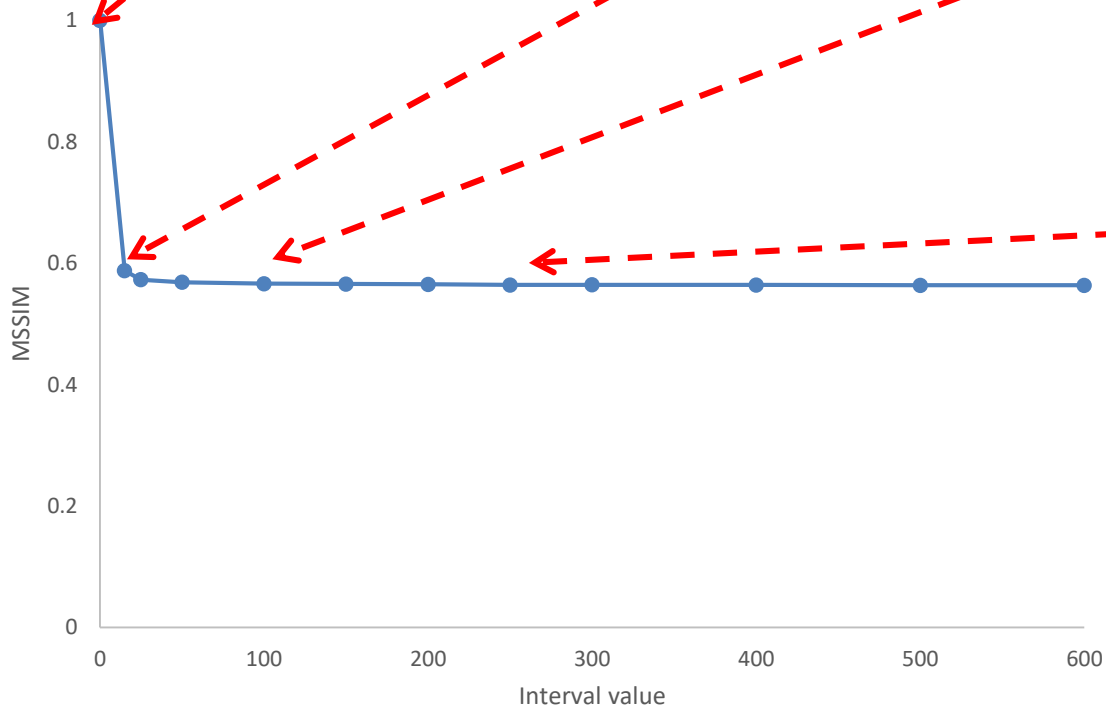
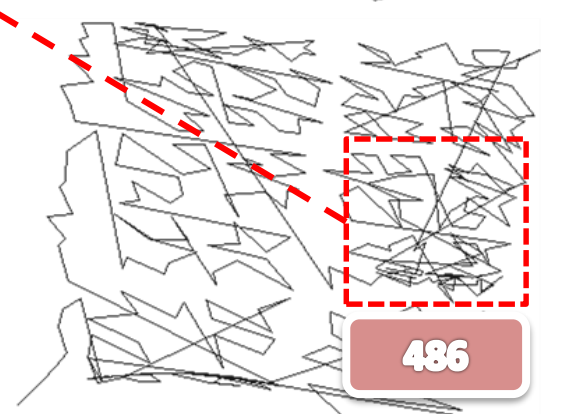
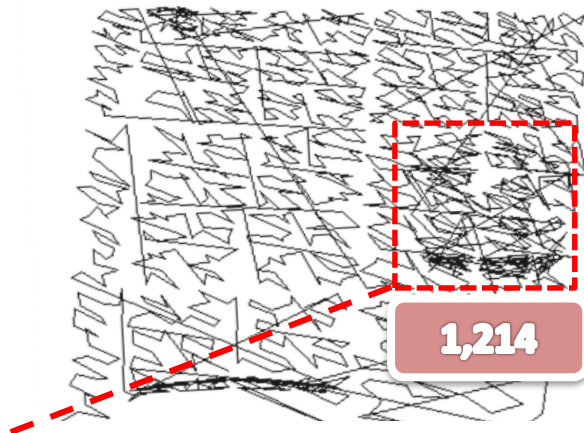
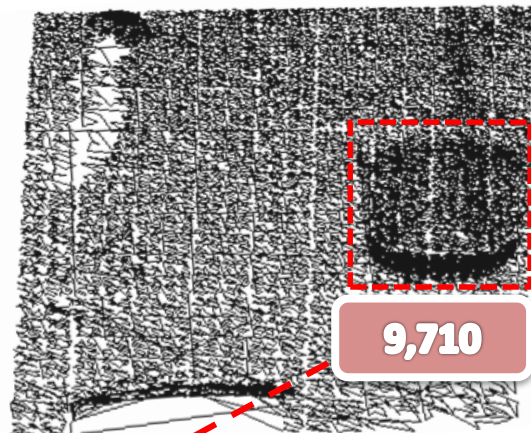
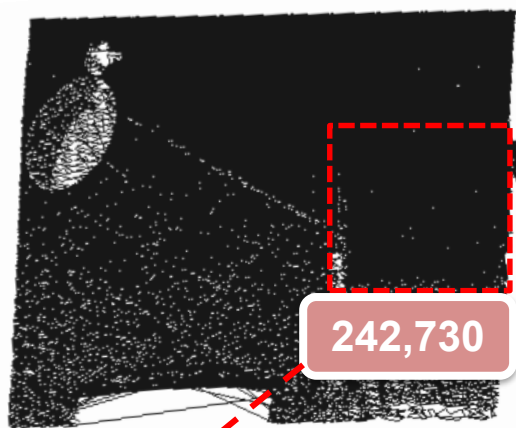


point of view-Nadir

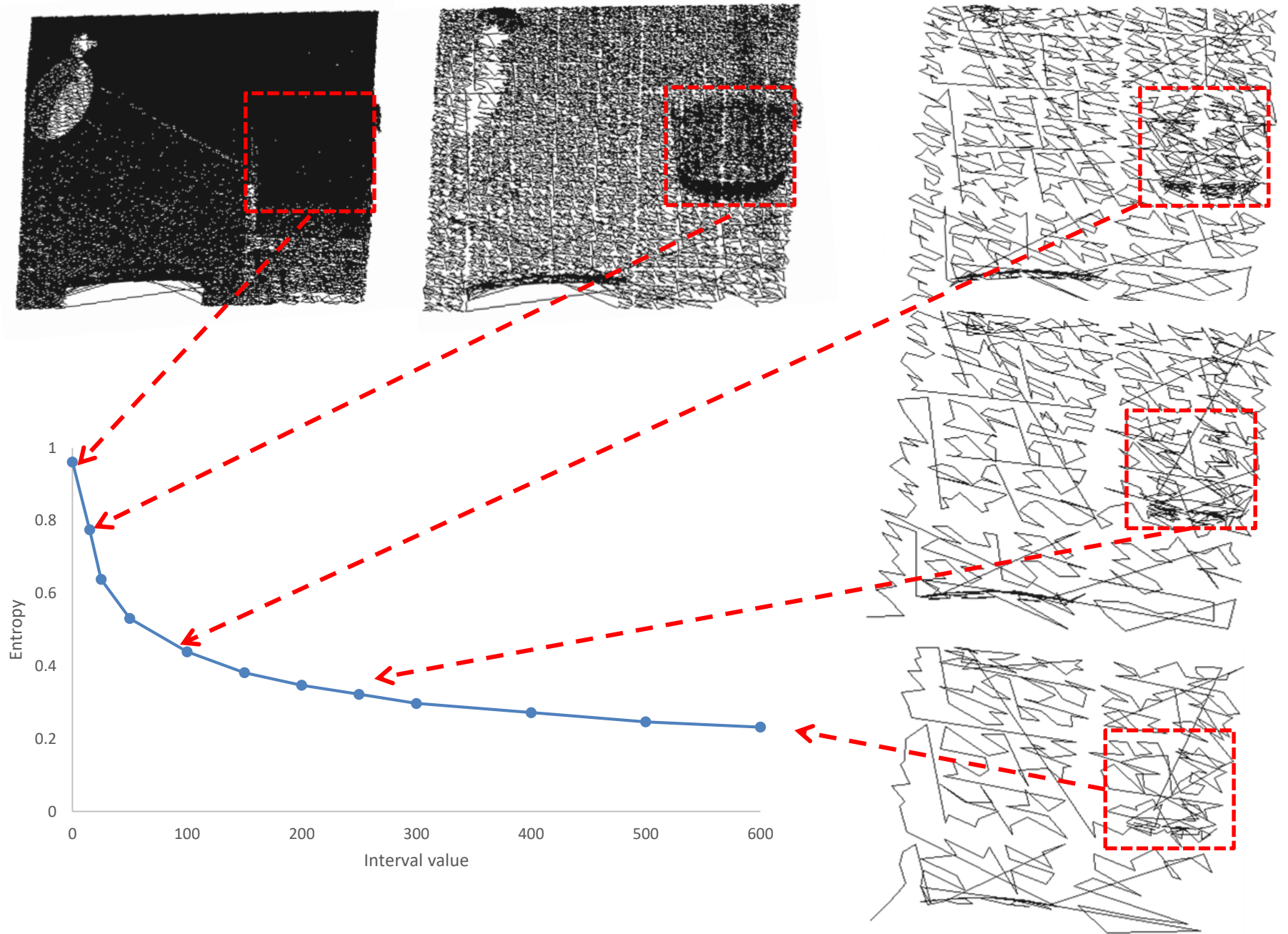
Dispersed point cloud



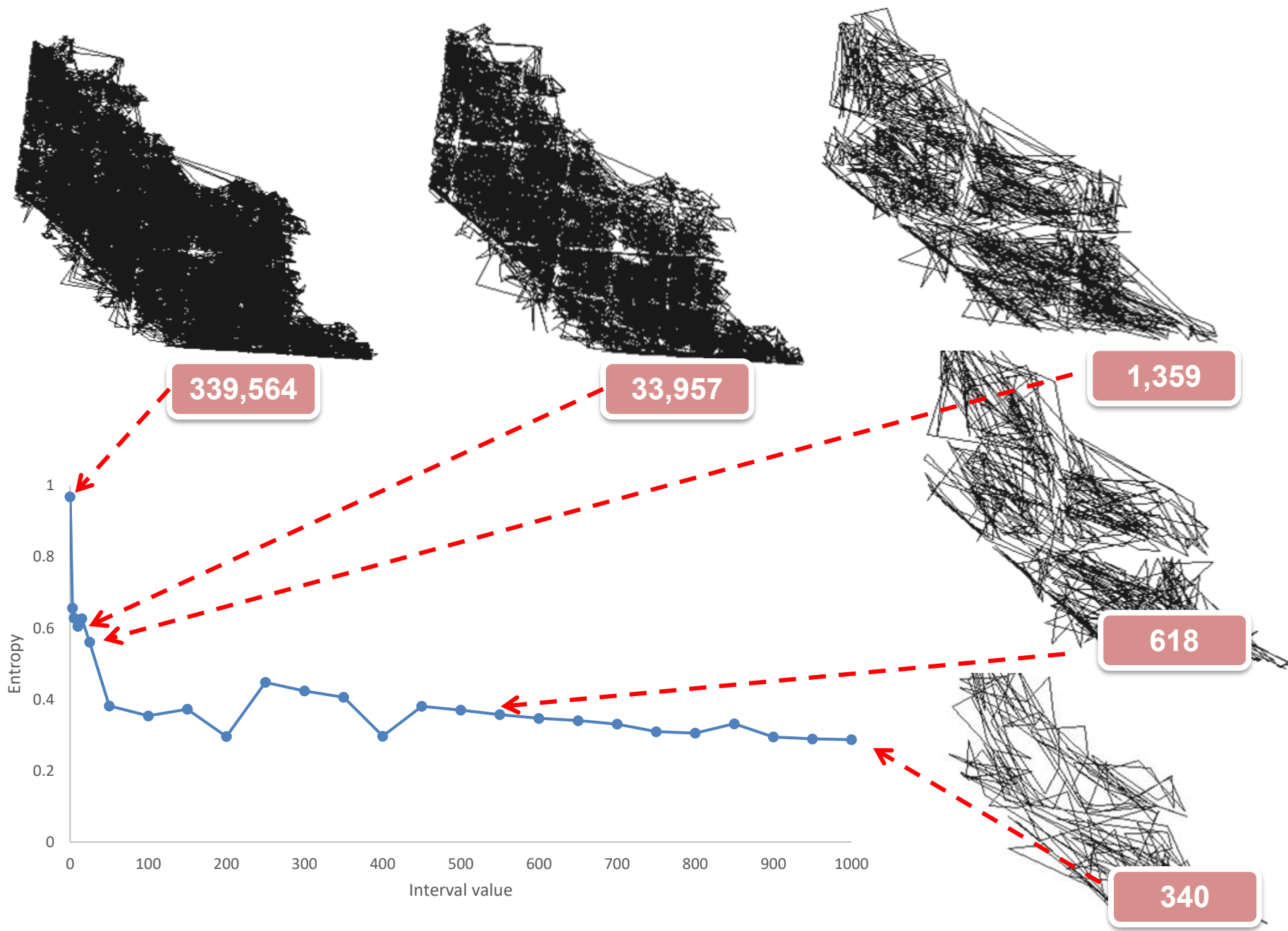
Clustered- Structural SIMilarity index (SSIM)



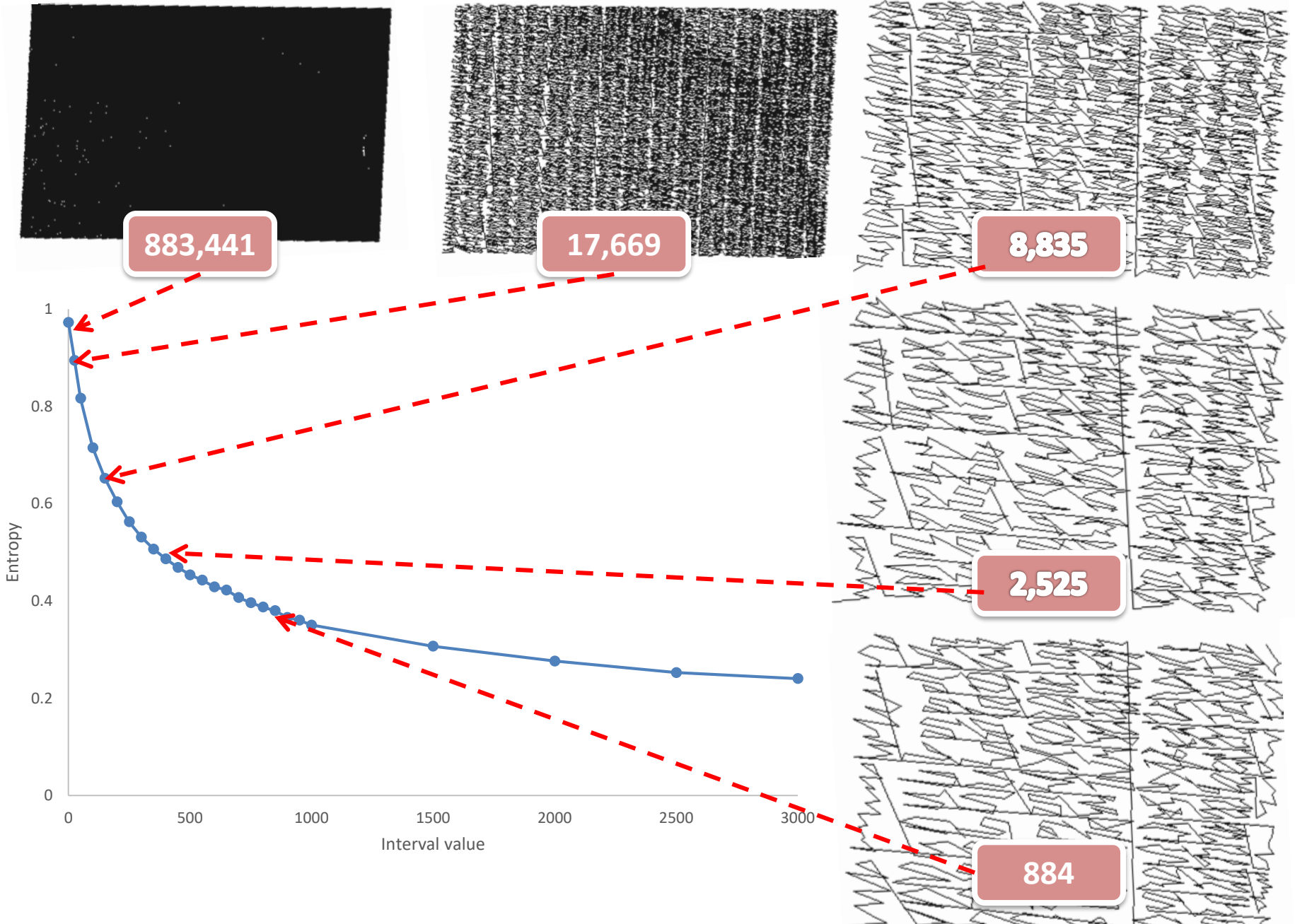
Clustered -Entropy



Random-Entropy



Dispersed-SSIM



Thank you for your attention!

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