

Triangulation From DEM

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VIP

- Significant points are selected from a DEM are constructed through Delaunay Triangulation
- These points are called Very Important Points (VIP)
- VIP are selected from significant pixels for two reasons
 - DTM models usually contain many pixels which cannot all be used in constructing a TIN
 - If all pixels are used, advantages of TIN are lost (e.g. simplifications and generalizations)

VIP Procedure

- Each point has 8 neighbors surrounding it
- The first two neighbors are connected by a straight line, then perpendicular distance is computed based on the central point of this line



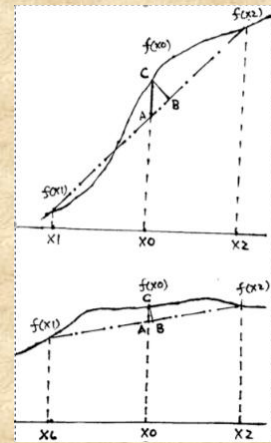
- An average of the four distances are taken to obtain a measure of significance for the point
- The least significant points are deleted first, and continues until:
 - The number of points reaches a predetermined limit
 - The significance reaches a predetermined limit

Function of VIP Procedure

- For any certain precision, a TIN constructed from a set of pixels should have the least number of points than any other set
- Any point belonging to the selected set should be more important than any point that does not belong to the set
- After all pixels have been assigned a significance degree, decisions can be made as to which pixels are more important

Histogram of VIP Procedure

- After all pixels have been assigned a significance degree, decisions can be made as to which pixels are more important



- In order to obtain triangulation through DEM, one must select VIP from the DEM, then do triangulation from the VIP

References

- Chen, Zi-Tan, and J. Amrando Guevara. "Systematic Selection of Very Important Points (VIP) from Digital Terrain Model for Constructing Triangular Irregular Networks." Environmental Systems Research Institute. Web. <[http://mapcontext.com/autocarto/proceedings/auto-carto-8/pdf/systematic-selection-of-very-important-points\(VIP\)-from-digital-terrain-models.pdf](http://mapcontext.com/autocarto/proceedings/auto-carto-8/pdf/systematic-selection-of-very-important-points(VIP)-from-digital-terrain-models.pdf)>.
- Klinkenberg, Brian. "Unit 056 - The TIN Model." National Center for Geographic Information and Analysis. Web. 02 Nov. 2009. <<http://www.ncgia.ucsb.edu/giscc/units/u056/u056.html>>.
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Questions

- 1. What are selected significant points from a DEM called?
- 2. T/F - A TIN constructed from a set of pixels should have the least number of points than any other set
- 3. Why are some pixels deleted when selecting VIP's?
- 4. What method is used to select significant points?