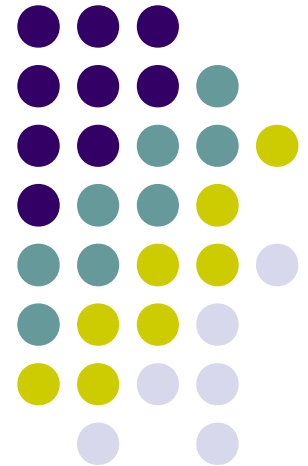
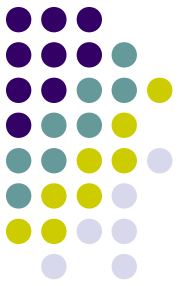


GENERALIZATION ALGORITHMS

Karel STAN:K, Ph.D.

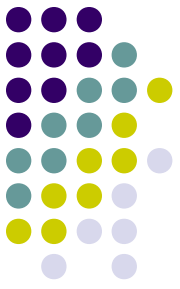


Simplification



- Oldest task, Perkal '58
- Three basic types
 - Weeder
 - Smoother
 - Unrestricted
- According scope
 - Local
 - Global

Simplification



- Approaches

- Random
 - N-th point
- Level of change
 - McMaster VectGen, Jenks
- Fixing extremes
 - Lang, DP
- Eliminate unimportant
 - Visvalingam

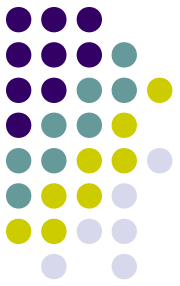
- Fractal

- Walking divider,
- Li-Openshaw

- Perkalist

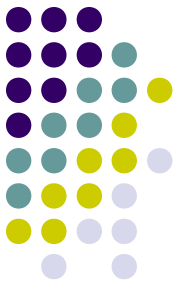
- Whirlpool, EdgeBuff

Simplification

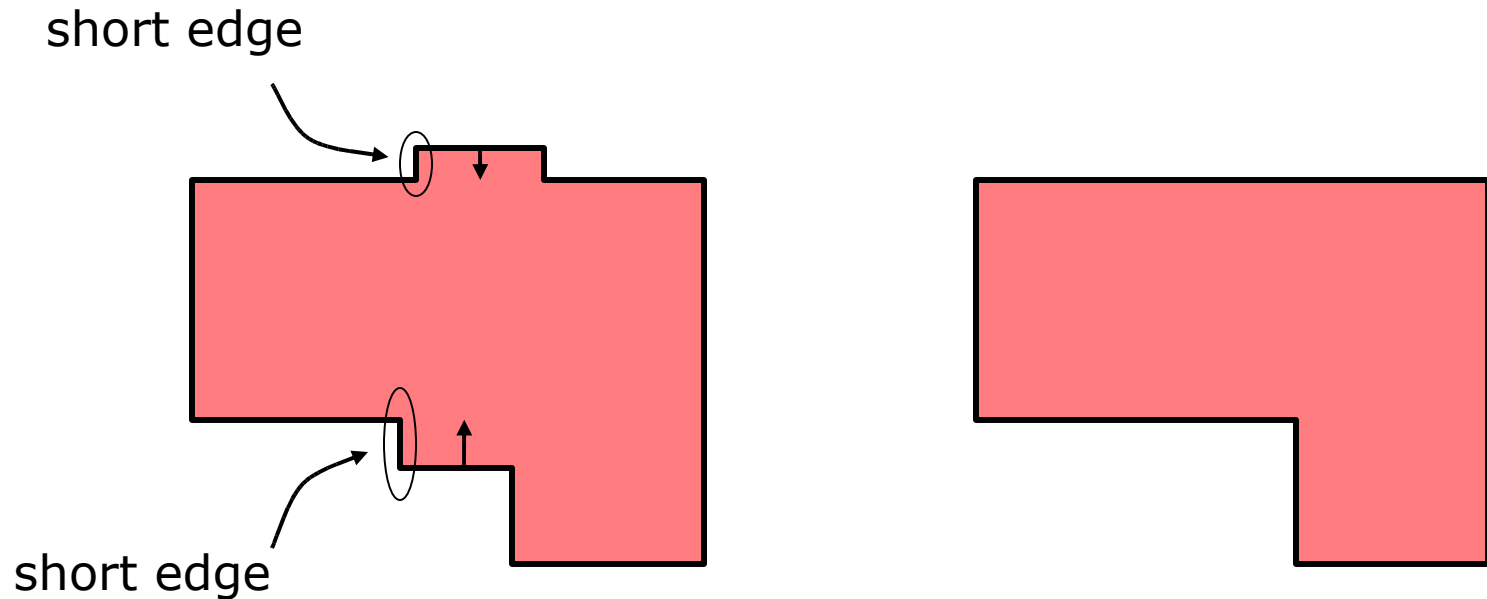


- Complications
 - Self-intersection
 - Spikes
 - Topological inconsistency
 - Unwanted exaggeration
- Smoothing eliminate some complications
- Unrestricted algorithms are usually time consuming
- Extended data models for prevention

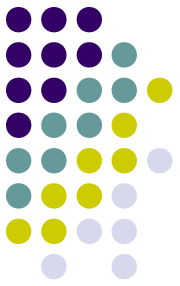
Buildings simplification



- Special case, rectangular shapes
- Lichtner '76
- Various approaches tested, include typification

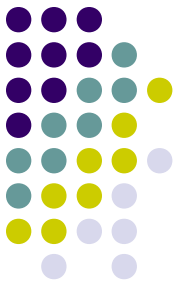


Collaps



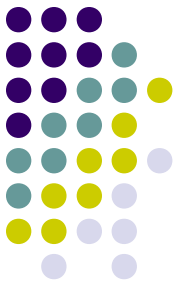
- Feature to point
- Area to line
- Skeleton based methods
- Various centroid based methods

Aggregation and amalgamation

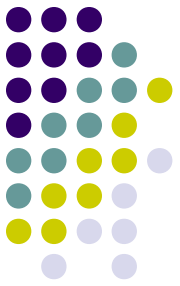


- Dissolve
- Convex Hull
- Mathematical morphology
 - Dilation: thicken with disc, Minkowski sum
 - Erosion: make thinner by thickening outside with a disc, Minkowski subtraction
 - Opening: first erosion, then dilation (same radius circle)
 - Closure: first dilation, then erosion

Mathematical morphology

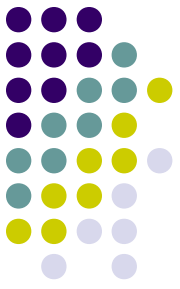


Displacement

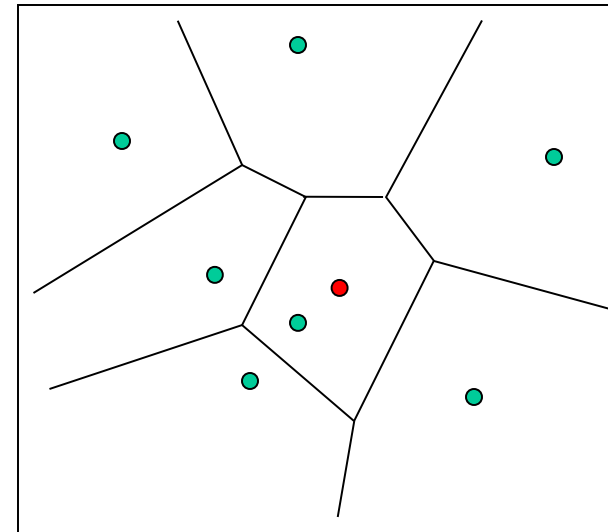
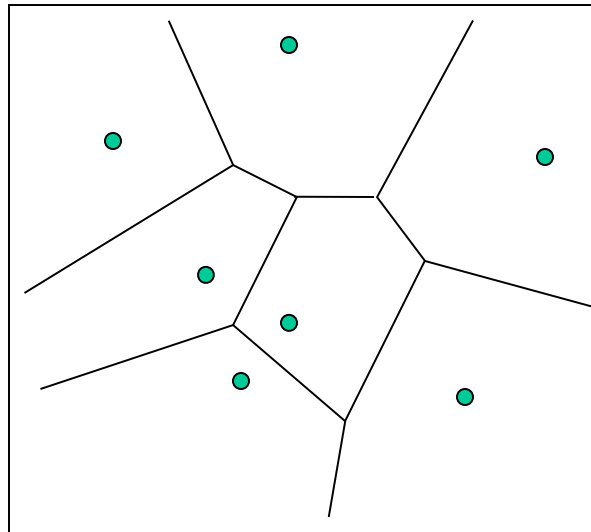
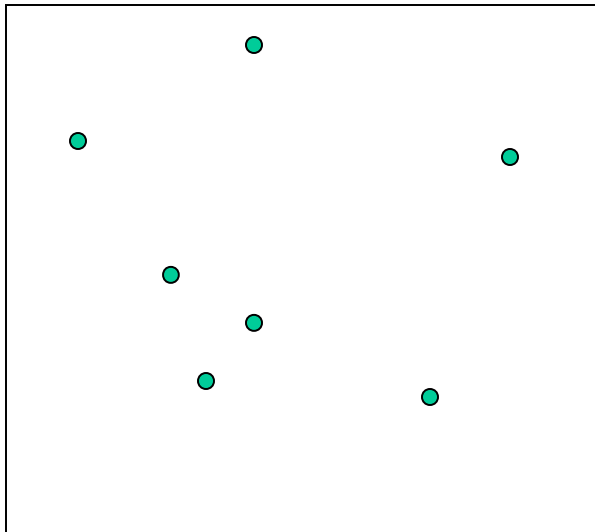


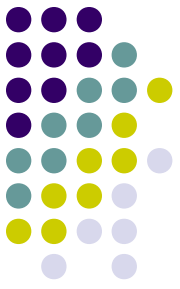
- Incremental
 - Feature per feature
 - Hierarchy is needed
 - Diameter-centroid displacement, Focus Line displacement
- Global
 - Voronoi diagram declustering
- Risk of spatial pattern destruction
- Time consuming

VD declustering

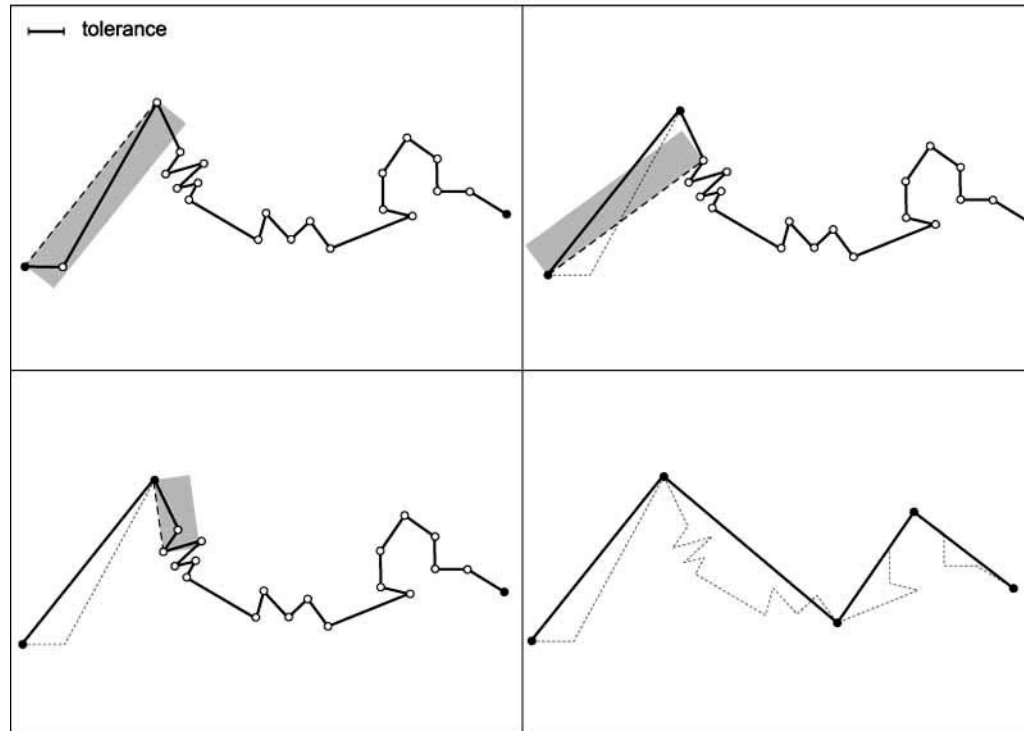


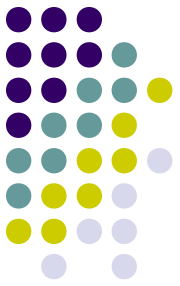
- Set P of points:
 - Compute VD of P
 - Move each point to the center of gravity of its Voronoi cell
 - Iterate (recompute VD)



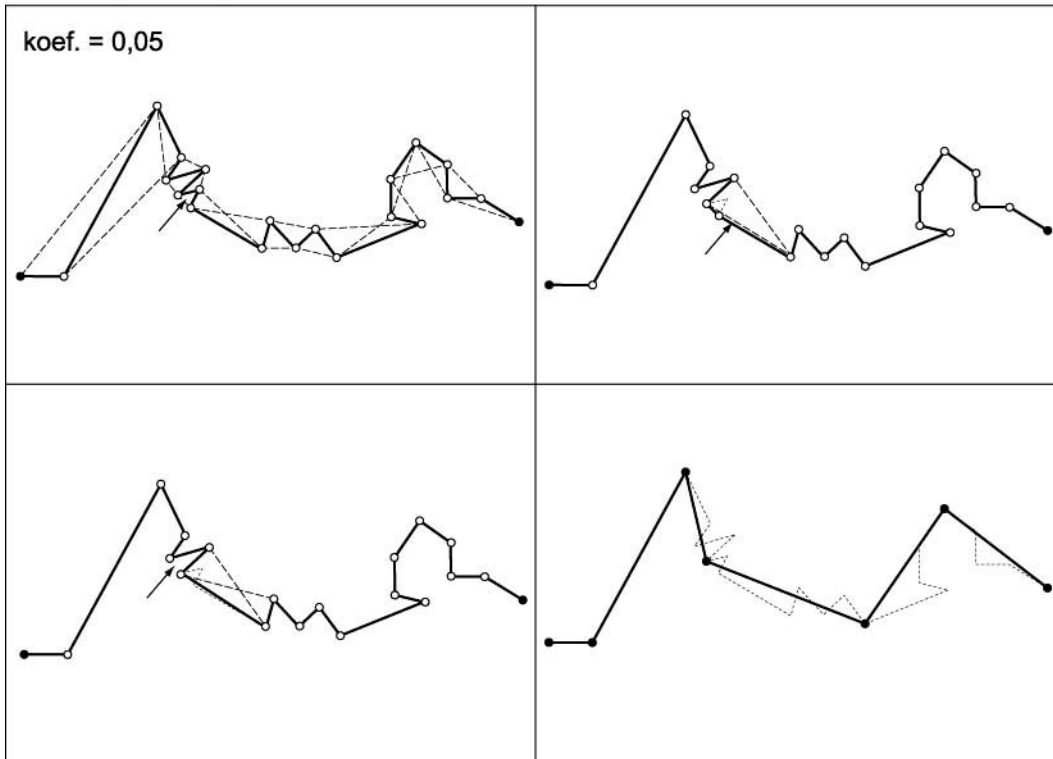


VectGen



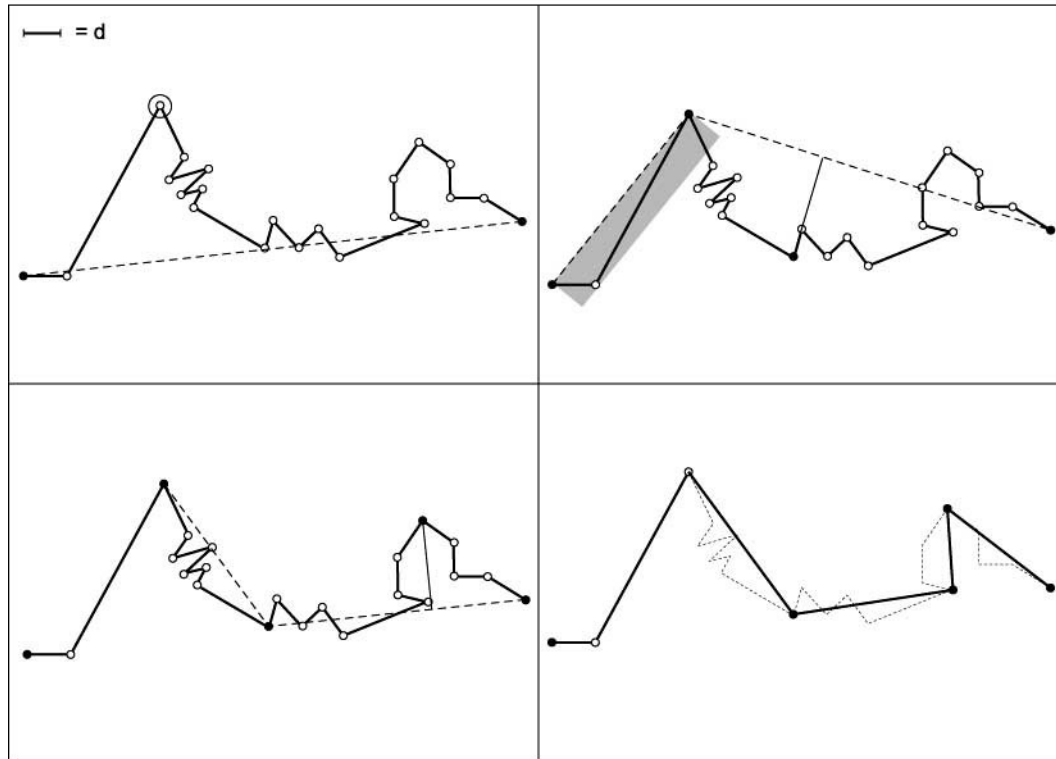


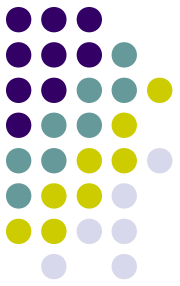
Visvalingam - Whyatt



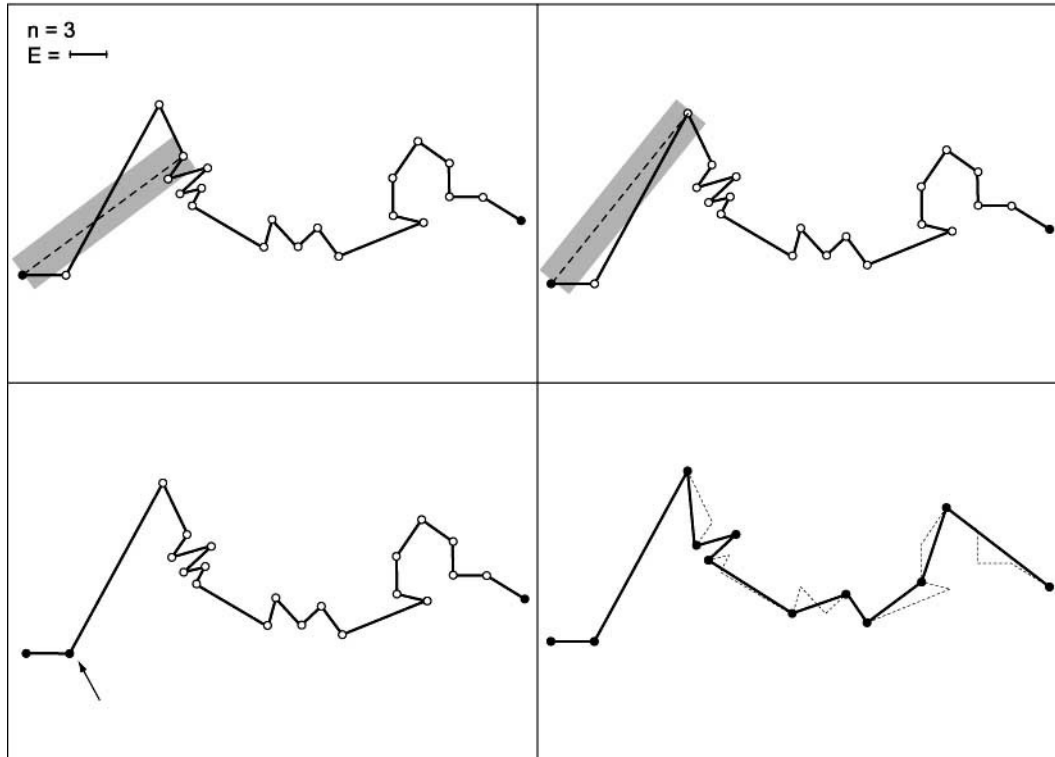


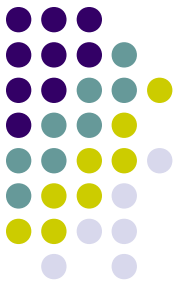
RDP/DUDA-HART



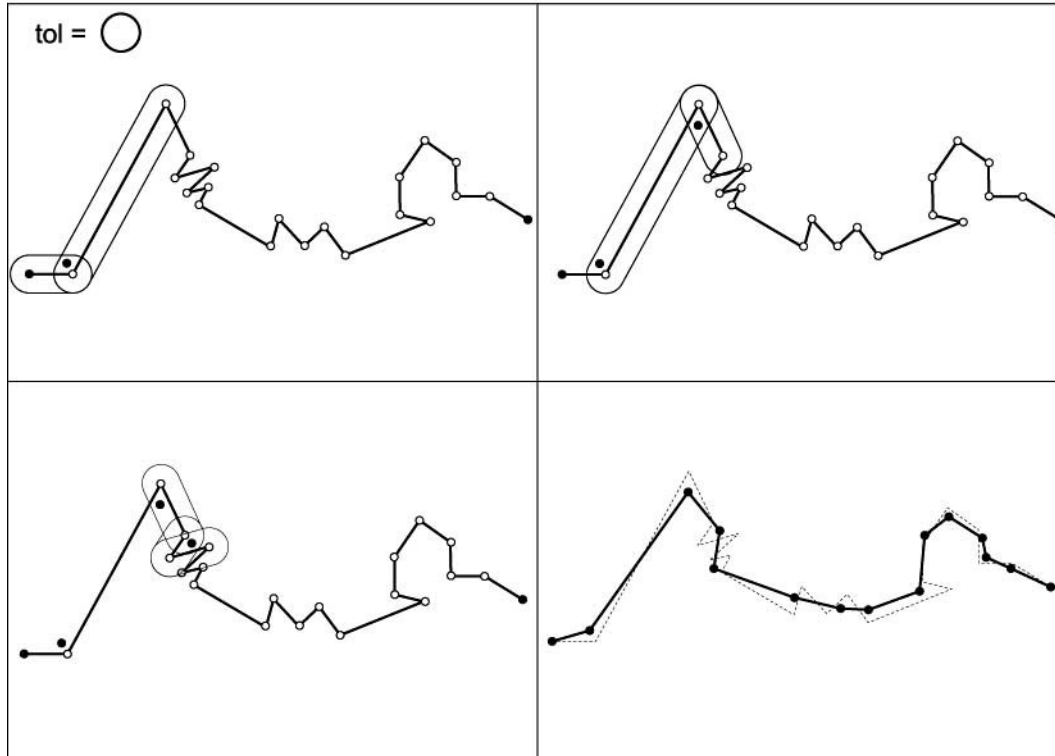


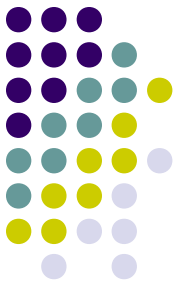
LANG



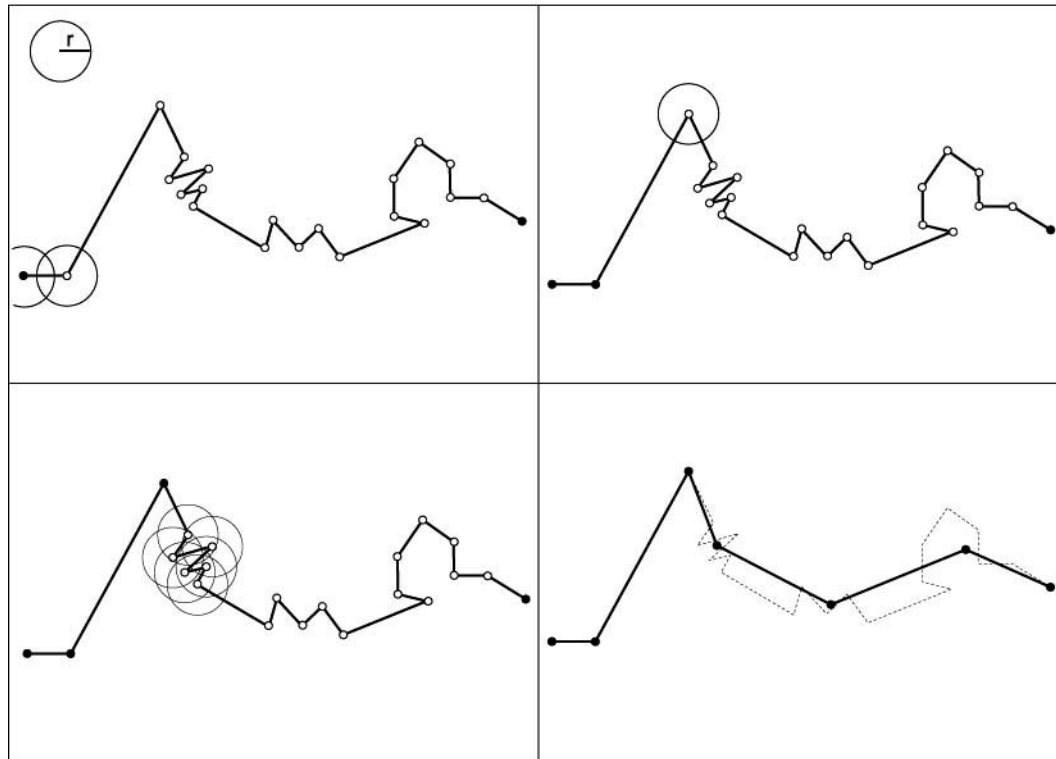


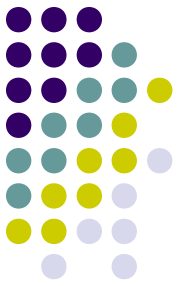
EdgeBuff



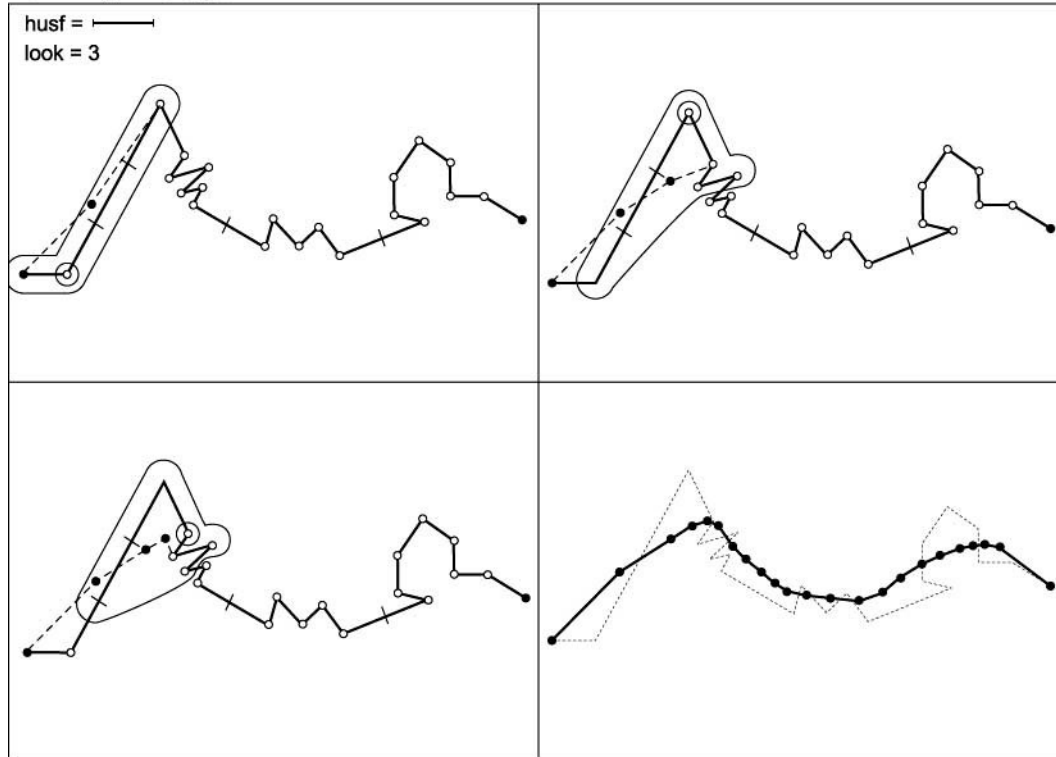


WHIRLPOOL





Running Average





GAUSS

