This relative neighborhood network is part of a family:

Proximity graphs

Write v_- and v_+ for the points $(-\frac{1}{2}, 0)$ and $(\frac{1}{2}, 0)$. The **lune** is the intersection of the open discs of radii 1 centered at v_- and v_+. So v_- and v_+ are not in the lune but are on its boundary. Define a **template** A to be a subset of $\mathbb{R}^2$ such that
(i) A is a subset of the lune;
(ii) A contains the line segment (v_-, v_+);
(iii) A is invariant under reflection (left - right and top - bottom)
(iv) A is open.
For arbitrary points x, y in $\mathbb{R}^2$, define $A(x, y)$ to be the image of A under the transformation (translation, rotation and scaling) that takes (v_-, v_+) to (x, y).

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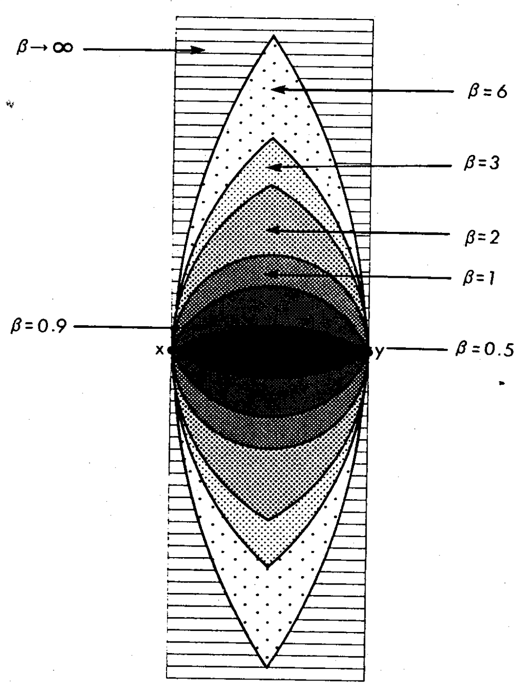
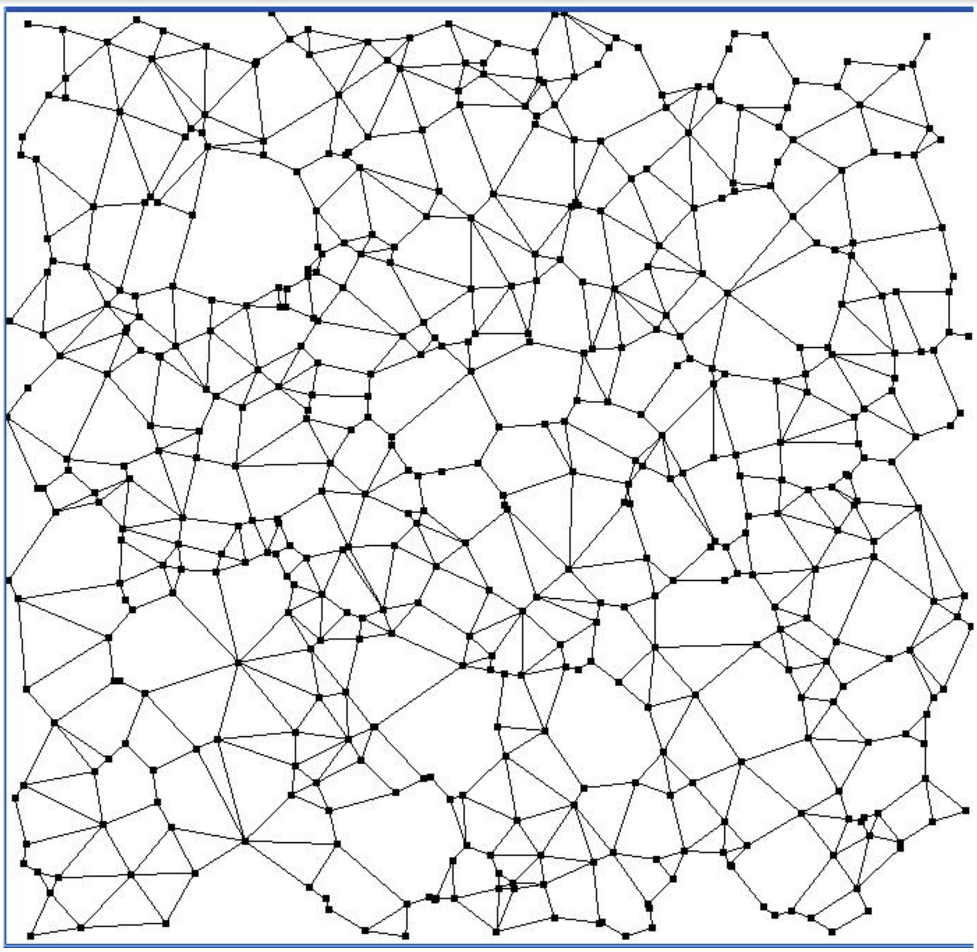


Definition. Given a template A and a locally finite set $\mathbf{x}$ of vertices, the associated **proximity graph** G has edges defined by: for each $x, y \in \mathbf{x}$,

$$(x, y) \text{ is an edge of } G \text{ iff } A(x, y) \text{ contains no vertex of } \mathbf{x}.$$

There are two "named" special cases.
If A is the lune then G is the **relative neighborhood network**.
If A is the disc centered at the origin with radius $1/2$ then G is called the **Gabriel network**.
Note that replacing A by a subset A' can only increase the edge-set.



Gabriel network on 500 cities.