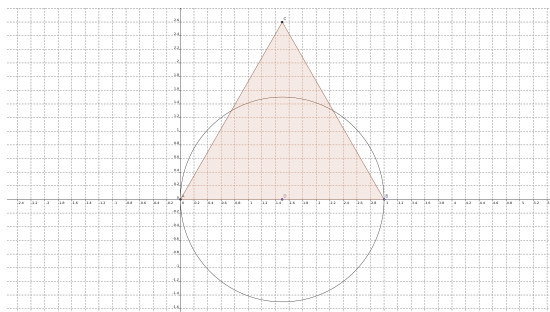# PFLOCK Report

Andres Calderon

University of California, Riverside

August 28, 2020

I was wrong...


However, finding triangles, or much better cliques, could be very useful...

Maximal cliques instead of just triangles

▶ A **clique**, C, in an undirected graph $G = (V, E)$ is a subset of the vertices, $C \subseteq V$, such that every two distinct vertices are adjacent.

▶ A **maximal clique** is a clique that cannot be extended by including one more adjacent vertex, that is, a clique which does not exist exclusively within the vertex set of a larger clique.

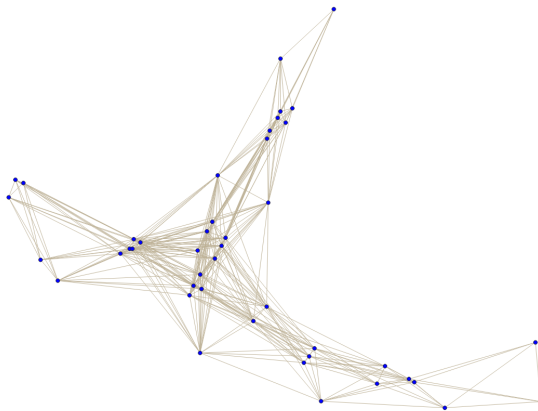# Maximal cliques instead of just triangles
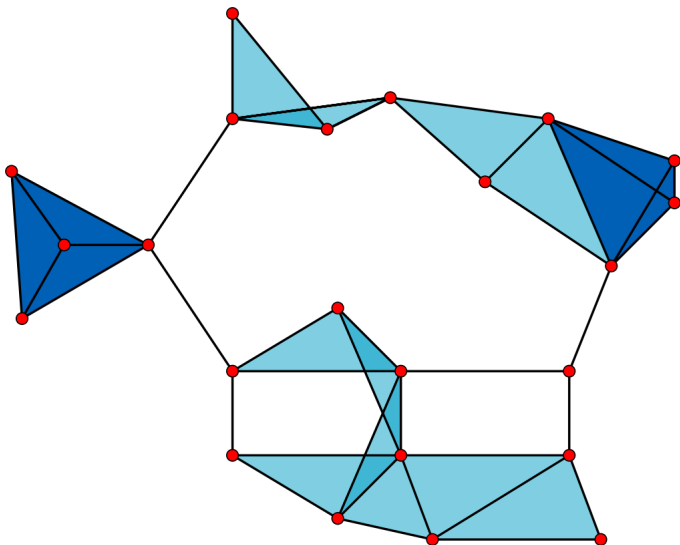
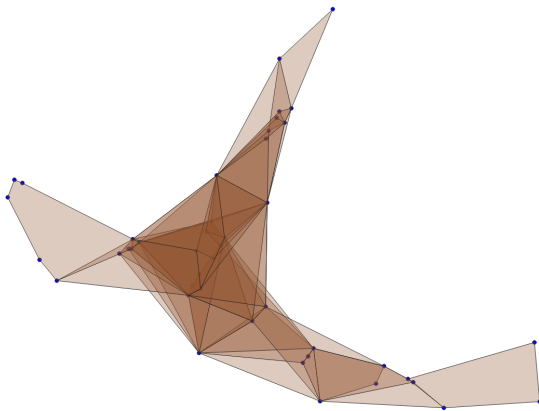# A maximal cliques based approach
Set of points
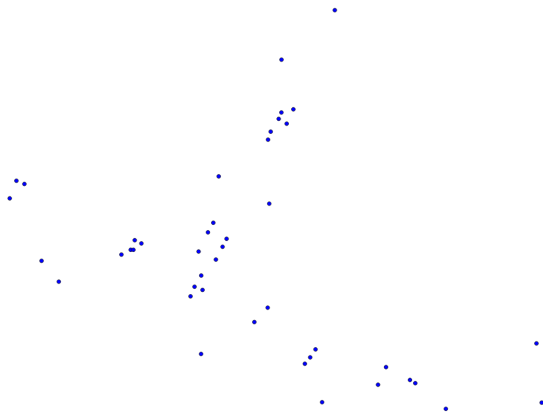
A maximal cliques based approach
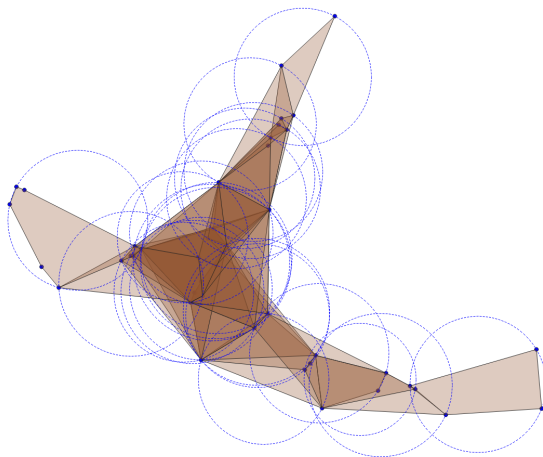## Finding pairs

A maximal cliques based approach
Finding maximal cliques

A maximal cliques based approach

Getting minimum bounding circles

Important notes

▶ It is required to perform additional processing if the radius of the minimum bounding circle is greater than $\frac{\varepsilon}{2}$.

▶ The cost of finding maximal cliques could be high (worst case $O(3^{\frac{n}{3}})$) but many algorithms reports to be practical in real-life graphs.

▶ The reduction on the number of candidate circles is significant (i.e. from 37272 to ≈1139 in just 0.804s).

A maximal cliques based approach

A large demo