Clique Operators in Digraphs

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Doing a review of the results obtained on the clique operator, a lot of water has flowed under the bridge...

We know what graphs live in the image, how difficult is to decide about them. We have played with the iterated clique operator and obtained results on convergence, divergence, periodicity, etc. Recently we have learned that clique-convergence is undecidable for infinite graphs. We have analyzed its behavior in certain classes of graphs. And as if this were not enough, there were also experts who got involved with the bicliques of a graph. These results have seen the light mainly in Latin America and that is why we are here!

In this talk we will show you what currently has us trapped, new versions of the clique operator but in directed graphs, the following two new operators:

Transitive Tournament Operator τ

- V(τ(D)) is the set of maximal transitive subtournaments of D (maximal by inclusion).
- A(τ(D)): if T_1 and T_2 are vertices of D and f_1, f_2, s_1, s_2 the corresponding sources and sinks, then $T_1 \to T_2$ iff $s_1, f_2 \in T_1 \cap T_2$ and $f_1, s_2 \notin T_1 \cap T_2$

Diclique Operator $\overrightarrow{K}$

- $V(\overrightarrow{K}(D))$ is the set of dicliques D that are maximal disimplex of D.
- $A(\overrightarrow{K}(D))$: if (A, B) and (A', B') are dicliques of D, then $(A, B) \longrightarrow (A', B')$ iff $B \cap A' \neq \emptyset$.

We will present our first results about them, the convergency, divergency and the behavior on certain classes of digraphs