L-Visibility Drawings of IC-planar Graphs

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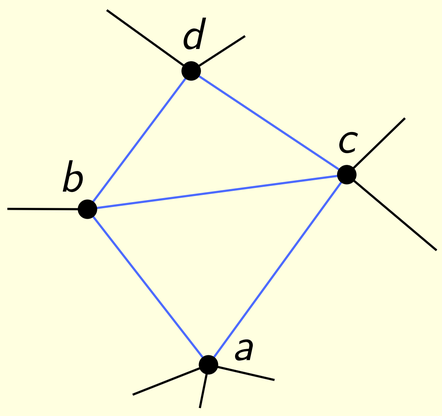
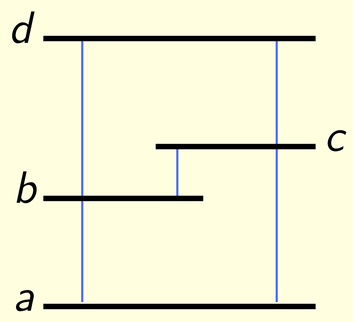
full version

Motivation



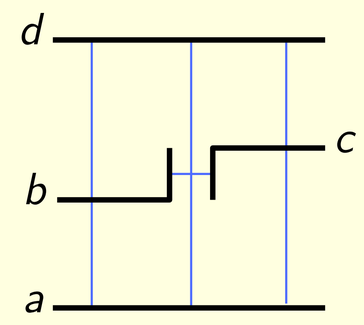
Planar Graph



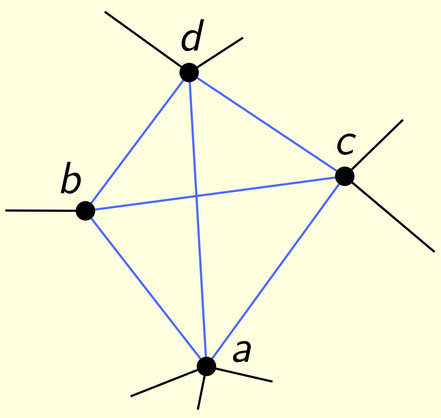
Visibility Drawing [7]

L-Visibility Drawing:

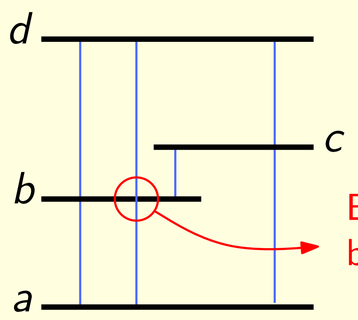
- Vertices = L-shapes
- Edges = Horizontal/Vertical Visibilities
- Crossings occur only between edges



L-Visibility Drawing [4]



1-Planar Graph



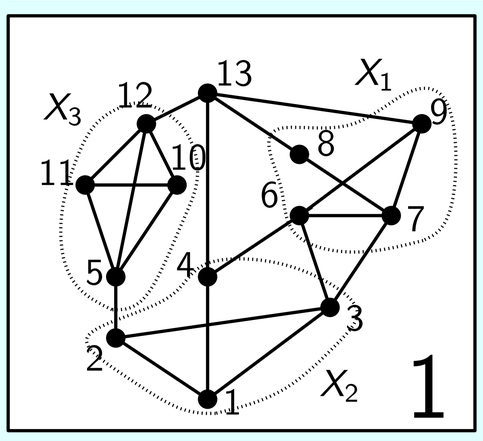
Bar 1-Visibility Drawing [1,3]

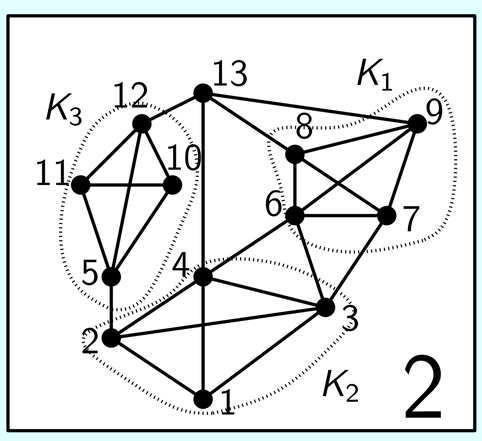
IC-planar graphs: 1-planar graphs such that any two crossed edges do not share an end-vertex [2,5,8].

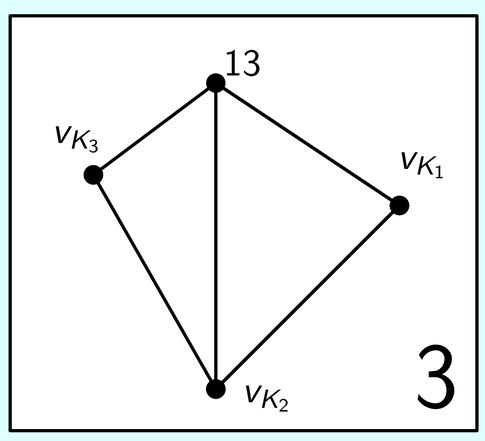
Theorem 1: *Every n-vertex IC-plane graph admits an L-visibility drawing in $O(n^2)$ area, which can be constructed in $O(n)$ time.*

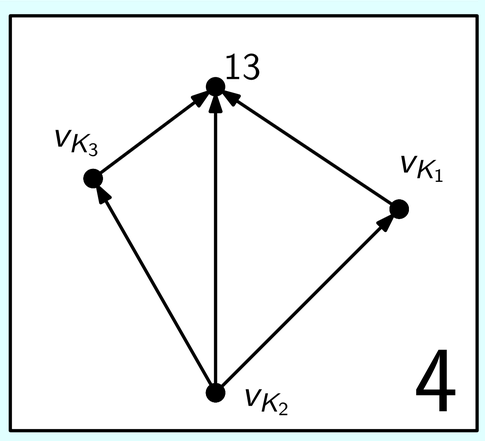
Corollary 1: *Every n-vertex IC-plane graph admits a RAC drawing with at most two bends per edge in $O(n^2)$ area, which can be constructed in $O(n)$ time.*

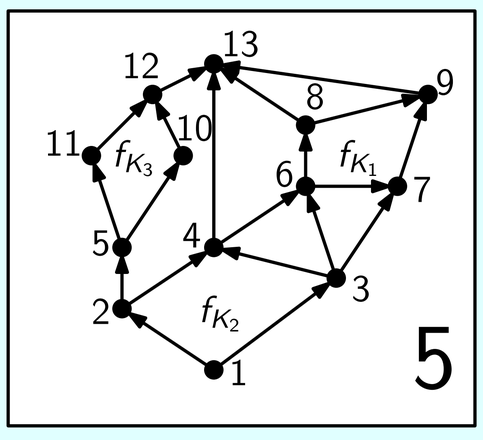
Results

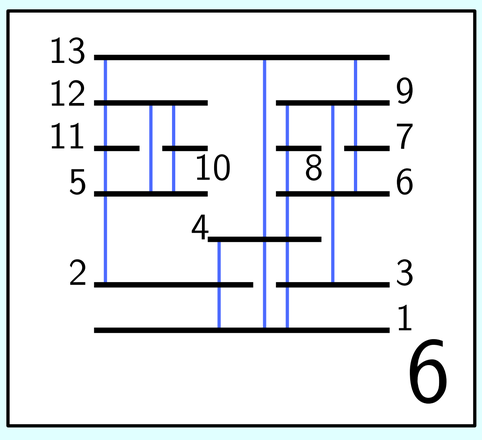


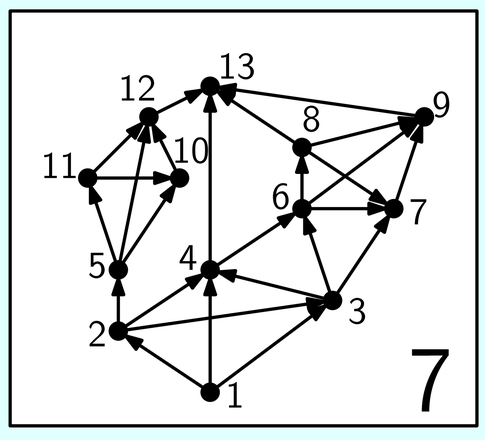


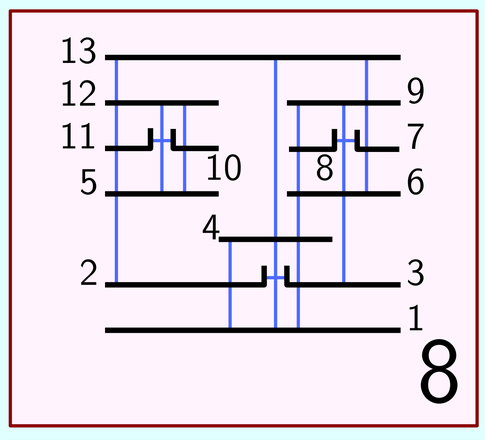






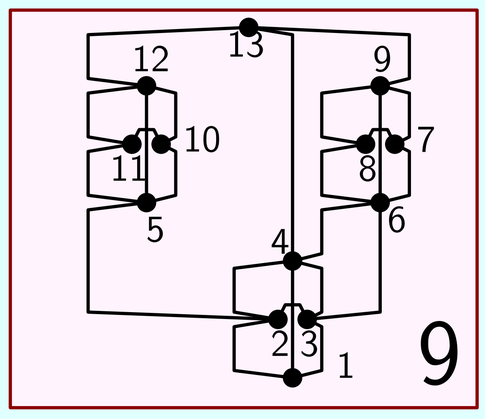






Open Problems:

- Does every 1-planar graph admit an L-visibility drawing, or a visibility drawing where the shape associated with each vertex is a more general +-shape?
- Does every IC-planar graph admit a RAC drawing with at most one bend per edge in polynomial area?



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