Compact Drawing of Clustered Layered Graphs
Sergey Bereg\textsuperscript{UTD} Markus Völker\textsuperscript{UKA} Alexander Wolff\textsuperscript{UKA}

Universität Karlsruhe (TH)
Institut für Theoretische Informatik

University of Texas at Dallas
Department of Computer Science

Problem

Quick & Dirty: Linear-Time Recursion

Restriction

G must be triangulated and the cluster graph of G must be acyclic. This graph has an edge \((C_i, C_j)\) if on some layer a vertex or edge of \(C_i\) lies to the left of a vertex or edge of \(C_j\).

Approach

Recursively separate clusters by lines that divide the given convex boundary \(P\) of the outer face. Draw resulting subgraphs separately.

Solution

There are 3 cases when a face is split. Cases 1 & 2 are easy. Case 3 cannot occur since the cluster graph is acyclic!

Objective functions

- optimize for “nice” angles
- optimize for small angles

Check our Java-Applet at: http://i11www.ira.uka.de/clusteredgraph

Input:

embedded graph \(G(V, E)\) with disjoint clusters \(C_1 \cup \ldots \cup C_m = V\) and layers \(\lambda : V \rightarrow \{1, 2, \ldots, k\}\)

Output:
drawing with straight line edges and non-intersecting convex regions

Slow & Nice: Linear Programming

Objective functions

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- optimize for small angles

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