

Appendix

While implementing pinning, we noticed that a few pieces of information are missing. We have made several assumptions in efforts to replicate the paper’s results and provide a fair comparison against our layout method.

For instance, the paper does not state how node movement is affected when an edge is added between existing nodes. Although they are assigned to the D_0 node set, existing nodes do not move because their assigned pinning weight is high. As a result, these nodes do not properly transfer movement to their neighbors. Neglecting this case increases the likelihood of edge crossing, which degrades the graph’s readability over time. Instead, we have decided to assign pinning weights of 0 to these nodes, allowing these possibly distant components to move closer to minimize edge crossings.

Additionally, with initial node placement, the paper does not specify how far new nodes should be placed from their reference points. When new nodes with no edges are added, we place them away from the center at a distance based on the relationship between the central node’s attractive forces and repulsion forces of nodes. We have included a scaling factor to modulate this calculated distance because graph layouts’ bounding boxes vary in size. When a new node v is connected to a position node u , we place node v a distance dl away from u on a line towards the center node. In our implementation, the central node is positioned at (0,0) and is the bounding box center when calculating the forces. Since the attractive forces for the central node are not mentioned, we picked a magnitude which best replicates their results when using our force model.

Frishman and Tal’s algorithm stops coarsening after 4 levels or “several” hundred nodes. We use 200 for our implementation. Also, their distance-to-modification pass has a cutoff at D_{max} , which we set to 6 in our implementation.

Since aging can be applied to any incremental layout, we have decided to incorporate it into our method. To do so, we make assumptions on what the aging rate is for our data sets. The aging rate is used to tune the trade-offs between graph structure and evolutionary changes. We set aging rate as 0.5 in our implementation.