

Paper Review Course Project 600.488 Geometric Algorithms

Due: Wednesday, April 28, 1999

If you choose to do a paper review for your project, you should typeset the review in at least an 11pt font, preferably using the L^AT_EX document preparation system, and run at least 5, but no more than 10, pages. (Graduate students in computer science **must** use the L^AT_EX system to prepare their reports.) Note: your paper will be graded 50% on style and 50% on how well it incorporates the following components:

1. bibliographic info., i.e., title, author, journal, etc., for each paper included in the review.
2. a summary of the results of each paper.
3. an overview of the contributions, including
 - (a) significance of the problems studied (e.g., people who studied it before, applications, how it may be used),
 - (b) comparison with previous related work,
 - (c) identification of new techniques and approaches introduced,
 - (d) deficiencies, omissions, and weak parts.

The groups of potential papers for your review include the following:

1. tree drawing [3, 7, 9]
2. planar embeddings [4, 5, 6, 11, 13]
3. orthogonal layouts [1, 12, 10]
4. force-directed layouts [14, 2, 8]

References

- [1] T. Biedl and G. Kant. A better heuristic for orthogonal graph drawings. *Comput. Geom. Theory Appl.*, 9:159–180, 1998.
- [2] Franz J. Brandenburg, M. Himsolt, and Christoph Rohrer. An experimental comparison of force-directed and randomized graph drawing algorithms. In F. J. Brandenburg, editor, *Graph Drawing (Proc. GD '95)*, volume 1027 of *Lecture Notes Comput. Sci.*, pages 76–87. Springer-Verlag, 1996.
- [3] T. M. Chan, M. T. Goodrich, S. R. Kosaraju, and R. Tamassia. Optimizing area and aspect ratio in straight-line orthogonal tree drawings. In S. North, editor, *Graph Drawing (Proc. GD '96)*, volume 1190 of *Lecture Notes Comput. Sci.*, pages 63–75. Springer-Verlag, 1997.

- [4] N. Chiba, T. Nishizeki, S. Abe, and T. Ozawa. A linear algorithm for embedding planar graphs using PQ-trees. *J. Comput. Syst. Sci.*, 30(1):54–76, 1985.
- [5] M. Chrobak and G. Kant. Convex grid drawings of 3-connected planar graphs. *Internat. J. Comput. Geom. Appl.*, 7(3):211–223, 1997.
- [6] H. de Fraysseix, J. Pach, and R. Pollack. How to draw a planar graph on a grid. *Combinatorica*, 10(1):41–51, 1990.
- [7] P. Eades, T. Lin, and X. Lin. Two tree drawing conventions. *Internat. J. Comput. Geom. Appl.*, 3:133–153, 1993.
- [8] T. Fruchterman and E. Reingold. Graph drawing by force-directed placement. *Softw. – Pract. Exp.*, 21(11):1129–1164, 1991.
- [9] A. Garg, M. T. Goodrich, and R. Tamassia. Planar upward tree drawings with optimal area. *Internat. J. Comput. Geom. Appl.*, 6:333–356, 1996.
- [10] A. Garg and R. Tamassia. A new minimum cost flow algorithm with applications to graph drawing. In S. C. North, editor, *Graph Drawing (Proc. GD '96)*, Lecture Notes Comput. Sci. Springer-Verlag, 1997.
- [11] G. Kant. Drawing planar graphs using the canonical ordering. *Algorithmica*, 16:4–32, 1996. (special issue on Graph Drawing, edited by G. Di Battista and R. Tamassia).
- [12] Md. Saidur Rahman, Shin-ichi Nakano, and Takao Nishizeki. A linear algorithm for optimal orthogonal drawings of triconnected cubic plane graphs. In G. Di Battista, editor, *Graph Drawing (Proc. GD '97)*, volume 1353 of *Lecture Notes Comput. Sci.*, pages 99–110. Springer-Verlag, 1998.
- [13] W. Schnyder. Embedding planar graphs on the grid. In *Proc. 1st ACM-SIAM Sympos. Discrete Algorithms*, pages 138–148, 1990.
- [14] W. T. Tutte. How to draw a graph. *Proceedings London Mathematical Society*, 13(52):743–768, 1963.