

1106-05-1336

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328 Natural Sciences Bldg, Louisville, KY 40292. *The PC-Tree Algorithm, the Torus, and  
Kuratowski Subdivisions*. Preliminary report.

The PC-Tree Algorithm of Shih and Hsu (1999) is a practical linear-time planarity algorithm that provides a plane embedding of the given graph if it is planar and a Kuratowski subdivision otherwise. We discuss extending the PC-Tree Algorithm to a polynomial-time toroidality algorithm, which would provide a torus embedding of the graph or a minimal obstruction to this. As a milestone toward this goal, we exhibit such an algorithm for  $K_{3,3}$ -free graphs. We also discuss a concept related to torus obstructions, the structure of graphs coverable with Kuratowski subdivisions. (Received September 12, 2014)