

UNIVERSITY OF SOUTH FLORIDA

Defense of a Master's Thesis

Computing the Rectilinear Crossing Number of K_{n+1} from K_n

by

Soundarya Revoori

For the MSCS degree in Computer Science & Engineering

Rectilinear crossing number of a graph is the number of crossing edges in a drawing with all straight-line edges. The problem of drawing an n -vertex complete graph such that its rectilinear crossing number is minimum is known to be an NP-complete problem. In this thesis, we present a heuristic that attempts to achieve the theoretical lower bound value of the rectilinear crossing number of an $n+1$ vertex complete graph from that of n vertices. Our algorithm accepts an optimal or near-optimal rectilinear drawing of K_n graph as input and tries to place a new node such that the crossing number is minimized. The time complexity of the proposed algorithm is $O(n^3)$. The heuristic is not guaranteed to yield optimal solution as the search space is constrained by the input graph. In our experimental results, we obtained optimal results for complete graphs up to $n=27$.

June 19, 2017

9:00 am

ENC 3408

THE PUBLIC IS INVITED

Examining Committee

Srinivas Katkoori, Ph.D., Major Professor

Sriram Chellappan, Ph.D.

Hao Zheng, Ph.D.

Robert Bishop, Ph.D.
Dean, College of Engineering

Dwayne Smith, Ph.D.
Dean, Office of Graduate Studies

Disability Accommodations:

If you require a reasonable accommodation to participate, please contact the Office of Diversity & Equal Opportunity at 813-974-4373 at least five (5) working days prior to the event.