P.U.R.E. Research Plan Form

Mentee Information
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Spring 2015 Research Plan

1.) Write a brief outline of your research plan:

Graph partitioning is very important in parallel programming (most math problems can be thought of in terms of graphs). If a graph is partitioned well (similar number of nodes per process and few edges between processors), the program will be MUCH more efficient than a poorly partitioned graph. Being able to visualize these factors can help determine if poor performance is due to graph partitioning.

I will work on displaying a single processor’s portion of the graph. The idea is that if the two parts of this project are put together, when you click on one of the big circles, this zoomed in version will show. This version will plot the local portion of the graph, displaying each node that is stored locally as well as all of the edges connected to those nodes. The edges that are connecting two nodes that are both stored locally could be colored gray, but all edges that are connecting one of these nodes to a different process should be colored according to which process they connect to (so say 5 edges connect nodes on proc 0 to nodes on proc 1, these 5 edges would be colored green. If there are 3 edges between proc 0 and proc 2, these could be colored blue. And so on). If you click on one of the green edges, it will display how many green edges there are, and how this compares to the average/max/min number of shared edges between any two processes.

2.) What do you hope to learn and achieve by the end of the semester?

I hope to learn more about the process of research, more about graphs and their extreme complexities. I also hope to garner new relationships that will be useful in the future.

Mentee Signature: Kartikey Desai  Date: Feb 20, 2015
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