Week 1-2 **[May 14 - 28 May]**

i. Travelling Salesman

ii. Minimum Vertex cover

iii. Minimum Steiner tree

iv. Minimum Maximal Matching

v. Greedy coloring with interchange

vi. Independent vertex set

vii. Dominating vertex set

viii. Local node connectivity

Week 3-5 **[May 28 - June 18]**

- Parallelize shortest path:

1. Floyd Warshall [4]
2. Bellman-Ford [5]
3. Johnson

- Disjoint Set data structure (Parallel and Sequential) [3]
- Karger's min cut algorithm
- Parallelize Kruskal's MST [1]

I am optimistic that at least the following will be ready for phase 1 evaluation (15th June)

- Parallel shortest path algorithms.
- All approximation algorithms and heuristics.
- Sequential Disjoint Set Data Structure.
- Karger's algorithm.

Week 6 **[June 18 to June 25]**

- Parallel implementation of centrality algorithms

1. Multi-threaded betweeness centrality
2. Multi-threaded closeness centrality
3. Multi-threaded radiality
4. Multi-threaded stress
5. Parallelize Pagerank [2]

Multi-threaded implementation of the centrality algorithms are lacking (Multi-process is already implemented for most of them). I will implement them, along with a parallel implementation of Page Rank.

Week 7-9 **[June 25 to July 16]**

- Parallel implementation of the heuristics and approximation algorithms in week 1-2.

I am optimistic that at least the following will be ready for phase 2 evaluation (13th July)

- Parallel centrality algorithms.
- Parallel heuristics and approximation algorithms.

Week 10-12 **[July 16 - August 6]**

- Parallel flow algorithms

1. Edmund-Karp
2. Dinic
3. Push-relabel

- Implement parallel priority queue. [6]

- Parallel Dijkstra's Shortest Path

Parallel Prim's Minimum Spanning Tree.

Any extra time remaining will be spent improving the efficiency of the algorithms already implemented in LightGraphs.

References

[1] Parallel Kruskal

[2] Parallel Pagerank

[3] Parallel Disjoint Set

[4] Parallel Floyd Warshall

[5] Parallel Bellman Ford

[6] Parallel Priority Queue

[7] Flo library

[8] Karger's min cut

[9] NetworkX