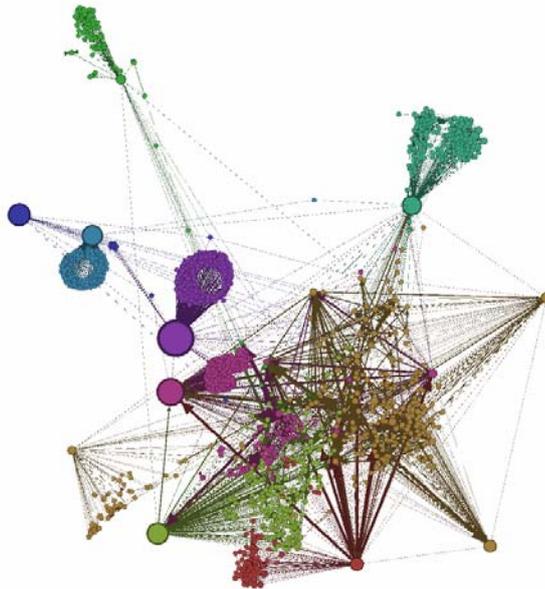


Location-Aware Mobile Application Design

Exercises 7/8, 10.5.2013

1. A sample Mopsi-Facebook connection network is shown below. A distance between two users A and B is defined as the number of links along the shortest path between the nodes. Now let suppose that user A has 69 other users within distance 1 (direct friends), 609 other within distance 2 (friends and their friends), 2004 and 2286 users are within distances 3 and 4, respectively. What is the expected (average) distance from A to any other node?



2. When calculating the shortest path between two nodes A and B, *betweenness centrality* of a node is defined as the number of paths passing through the given node. Usually high value indicates central location for the node in the network. Give a simple example demonstrating this, and a counter-example of a network in which this is not the case.
3. What steps do you need to do if you want to publish a photo from your website application to Facebook?
4. Three options for representing the cluster location on the map were discussed during the lecture. What are these three options? Discuss their advantages and disadvantages. Suggest alternative solution.
5. Why graph visualization is a problem in general? Give a simple solution for the problem in case of location-based data.