Continuation recommendation for the Heterogeneous Computing (Village Search GUI) project

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There are a few things I would recommend for the continuation of this project. First and foremost, the ability for a user to enter phase lines and boundaries lines should be implemented. The resource allocator will be able to interpret such constraints on the village and in turn create better search plans.

Next, the GUI should be able to display various bits of information to the user. First are the outputs for buildings before a resource allocation is received. The information which can be seen is; the buildings’ GPS center of mass, its size in meters squared, and the road segments which it is connected to. After a resource allocation is received, information would include all the data from before the resource allocation, as well as; which team will search the building, how long the building will take to search, and what number along the search path the building is. Next up are the road segments. First, before the resource allocation, the user will see information on; the length of the segment, which buildings the segment is connected to, and any other road segments it is connected to. Once the resource allocation data is received it will also show whether or not it is part of a search route. If it is part of a route it will show what segment of the search route it is, how long it will take to traverse the segment, and how long it will take to traverse the entire route. And finally once a resource allocation is received information about search units can be displayed. This information will include; where the unit’s initial GPS location is, where it’s final GPS location will be, what type of unit it is, what the unit’s id number is, what search path it will be taking, and how long it is estimated to be searching for. This information provided to the user will increase their understanding of the model and its resulting resource allocation.

The next important feature which should be implemented is the actual data transferring mechanism which will handle the transmission of data files to and from the resource allocator. I also think adding the ability to view the village at different levels should be implemented. This would allow different levels of authority to examine different levels of the model. For example a commander might want to look at an overall city view, whereas a squad leader might only need to look at a neighborhood view.

I also think it would be worthwhile to port the GUI over to mobile applications such as Apple’s iPhone or Google’s Android operating system. This would show that the application could be used in a setting where computers might not be accessible.

I also think that in the future, it would be a very useful feature, if the GUI could be connected to a satellite tile server. This would allow users to be able to pull up the satellite imagery in the application. This function would open up many options. It is possible that the user could go in and create a shapefile by hand based off the village they are looking at, so their data is up to date. Hopefully this process of creating shapefiles from high resolution satellite imagery can one day be fully automated. As of right now, there is a lot of promising research being conducted in this problem of feature extraction, but none have solved it completely.