IPRO 305 – HawkTour – An IIT Campus Tour Application
Midterm Progress Report

1. OBJECTIVES

The Spring 2004 IPRO 305 team will be continuing the efforts of ongoing research at IIT in the realm of Pervasive Computing. The team will be focusing on the challenge of integrating Pervasive Computing into a specific aspect of the IIT campus. The overall vision of the IPRO 305 team is to design and implement a prototype of an application called HawkTour – a virtual Illinois Institute of Technology tour guide. HawkTour will provide a completely new approach to the campus tour at IIT. The application will be designed to run on a tablet PC or a device with similar computing capability that will provide the user with general campus information while guiding the user around campus and maintaining complete awareness of the user's current location and intent, thereby adapting the tour to the user's own personal preferences. The objective for this semester's team is to build on the framework designed during the Fall 2003 semester, and increase the test bed of the system to include not only location awareness within buildings, but also outdoors. In addition, several new software features will be added, including the ability of the software to direct users towards items of interest.

Major design goals:
- Understand the current location and provide surrounding campus information. This includes respective building information and history about the building.
- Provide campus information on demand and at all times.
- User-friendly interface in navigation through the campus and in the campus buildings.
- The application should be easily extensible so that new campus tour features can easily be added.
- To replicate the application development process horizontally.

2. REVISED GOALS

Our goals have not been changed since the beginning of the semester.

3. CURRENT PROGRESS

The following tasks have been completed by the team thus far:

- Program functional in MTCC, but better error handling is needed.

Location Awareness Group:
- Location Service changed to a multi-threaded program.
- Location Service error handling improved.
- Message handler written.

Content Generation and Organization Group:
- Content service implemented with QuickTime can load and switch pictures and play audio.

Map Data Organization Group:
- Mapping algorithm design complete
- Sub-maps and map switching algorithm and designed in pseudo-code, with methods and variables needed.

4. TIMELINE

The team will continue to gather content to add to the database throughout the semester. The user interface will have been examined and studied, and any functional or aesthetic improvements will be underway. By the first week of April, both functional and user testing of the application will begin. On IPRO Day, the finished application will be presented to the public.

5. TEAM ORGANIZATION

Currently the team is divided into three groups that will each focus on one of the major aspects of the project. Responsibilities are not defined on an individual level; rather, the activities are assigned to a sub-group as a whole. The sub-group is assigned a leader who is responsible for delegating tasks among the sub-group members, and ensuring assigned tasks are accomplished. As the goals for each group are accomplished and the needs of the project change, members may be reassigned to different groups, old groups may dissolve, and new groups may be formed.

- *Location Awareness Group* – This group will continue development of the Location web service, which provides location information to the application. They will work closely with the mapping group to expand the functionality of the service to provide necessary functionality for the mapping subsystem.
  Members of this team: Tyler Butler, Satish Thomas, Arup Mazumdar, Matthew Rodriguez

- *Multimedia Group* - The multimedia group is charged with the responsibility of integrating QuickTime technology into the HawkTour application, and maintaining the organizational structure of the multimedia content.
  Members of this team: Jonathan Holley, Michael Reed, Chris Rosenthal, John Augustine

- *Map Data Organization Group* – This group will decide on the format that the maps are stored in, and will write an algorithm that will be used to switch between maps when the user moves between different areas. This group will also be responsible for finding an accurate position with the GPS unit and displaying it on the map, and for displaying directions to any location on campus when requested.
  Members of this team: Jacques Marcotte, Michael Foster, Ashwin Nair,
  Albert Chaharbakhshi

6. PROBLEMS

The largest issue the team has encountered thus far is the difficulty of being able to adapt the code that was written in previous semesters to fulfill our goals for this semester. A remaining problem is implementing the mapping and path finding code. Some major problems that have already been solved are devising a way for the GPS unit to communicate with the program, and error handling in the location service. The GPS communication problem was solved by using open-source GPS communication software, and a GPS unit that uses a standard communication protocol. The error-handling problem was solved by implementing multi-threading on the location service.