Worldwide, 161 million people have vision impairment, and without intervention that number is expected to almost double by 2020. The blind and visually-impaired encounter serious problems in leading an independent life due to their reduced perception of the environment. New environments pose a huge challenge for them to perceive their surroundings without seeking help from others. Current training programs for blind and visually-impaired people in University settings require them to memorize a large amount of information for numerous buildings, leading to an increase in frustration on their part. One of the biggest challenges to building an effective assistive technology system for the blind and visually-impaired is to model real-world problems faced by them in a software system that could address these issues.

In order to enhance the perception of indoor and unfamiliar environments of the blind and visually-impaired, as well as to aid in their navigation through such environments, we develop PERCEPT system which provides context-aware navigation services. PerceptSpace, which is generated using RFID (Radio Frequency Identification), and tagged spaces (audio landmarks), enables a ubiquitous computing system with contextual awareness of its users while providing them persistent and context-aware information. PERCEPT system supports a number of unique features such as: a) Low deployment and maintenance cost; b) Scalability, i.e. we can deploy the system in very large buildings; c) An on-demand system that does not overwhelm the user, as it offers small amounts of information on demand; and d) Portability and ease-of-use, i.e., the custom handheld device carried by the user and instructions are received audibly. The proposed system will complement existing mobility and orientation aids for the blind, such as the cane and/or dog.

**Interdisciplinary nature of the project:** We collaborate with the Massachusetts Commission for the Blind.

More details are provided at: dvd1.ecs.umass.edu/percept

**Brief description of what the student will be doing:**

The student will be expected to complete the following tasks:
1. get familiar with the technologies (hardware and software) involved in the PERCEPT system: passive RFIDs, Wi-Fi, Bluetooth, cellular communication.
2. write applications for this system both on a PDA as well as on a server.
3. participate in experiments on-campus
4. write a final report on the summer activities and give a final presentation to the lab.

Is this a CASA-related project? Yes ___ No _XX__

Preferred background of student (major(s), class, GPA, pre-requisites, etc.):

ECE major, at least a rising Junior, GPA above 3.2, with excellent system knowledge and programming experience. The student will work with a System Engineer and graduate students, so a pleasant and cooperative personality is imperative.

Did you mentor a student last summer in the College REU Program?

Yes XX____ No ____

If yes, please describe the outcomes for that student (i.e. Honor’s thesis, conference presentations, manuscripts, papers, etc. Describe accomplishments to date as well as plans for the spring semester if the work has continued):

The student has submitted a final report for his work.

Please return this form via email to Lorraine Robidoux: lrobidou@ecs.umass.edu by Friday, February 5, 2010