

## **Technical Abstract**

Title: VisionARI – Vision Assisting Resources for Independence in Finding and Identifying Objects and Navigating Environments for People Who are Blind or Visually Impaired.

VisionARI is an indoor way-finder application for a smart phone (including but not limited to the iPhone and Nokia). The user is provided a map and set of directions so as to familiarize oneself with the layout of an indoor environment of interest. This capability although not dependent upon ubiquitous Bluetooth or Wi-fi, is compatible with these beacons if they are present within a particular location. In turn, these beacons (as well as RFID tags) serve as a form of route validation within an indoor environment.

Phase I of this multi-phase project demonstrated the technical merit, feasibility and cost efficiency of combining commercially available mobile technology with RFID readers, database, voice control and speech synthesis technology to develop the VisionARI prototype. A usability analysis with 15 actual users validated the utility of the system.

CCI will now build on the success of this project by:

- 1) Enhancing and completing the VisionARI system and application
- 2) Expanding the number of smart phones supported
- 3) Creating a web-based central repository for map media
- 4) Performing an extended usability evaluation of the device in a range of indoor travel in vocational, educational, typical public scenarios
- 5) Preparing for a smooth transition into commercialization

### **Anticipated Results and Implications of the Approach**

VisionARI will address a large pent-up demand, as nearly 11 Million Americans are classified as having a significant visual impairment of which 2.3 Million have a profound visual impairment. The multiple functionality, affordability and portability will increase adoption of the approach.

This will enable people with visual impairments, perhaps for the first time to conveniently orient themselves and efficiently navigate to their desired destination within a building without having to commit a daunting breadth of information to memory (such as number of paces, turns, location of landmarks, changes in landscape or flooring, raised flooring or trip hazards, handrails, location of stairs and number of stairs, elevators, escalators, etc). This approach will directly enhance independence and facilitate increased productivity for users in both workplace and educational settings, as well as have a significant impact on typical activities of daily living.

### **Potential Commercial Applications / Anticipated Benefits**

VisionARI meets a critical need because this population has been underserved by existing technology. The demand is expected to be high among the target population of blind or visually impaired persons because of: 1) the need for navigational assistance in areas where GPS does not work (i.e., inside buildings), and 2) the high adoption rate resulting in a wide range of facilities and buildings supported, and 3) the ability to quickly identify and find items. Efforts made on this project can readily be leveraged to other applications within this population, as well as other

populations requiring assistive technologies, such as the cognitively impaired. VisionARI consumers will benefit as RFID becomes increasingly adopted by commercial manufacturers, marking not only items, but their location for asset tracking purposes.