A Next-Generation Cane for the Visually Impaired

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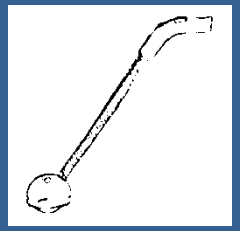

Abstract

The options of mobility aid for the visually impaired are limited. These include the standard white cane and intelligent guide dogs. The white cane is a common choice as it is inexpensive, light, and easy to use and comes in 5 different types depending on the need of the user. While guide dogs offer the benefit of interaction and independence with the user, they are more expensive and require training and care. Our concept, the EyeSphere, is a device that gives newfound confidence and independence to those with visual disabilities. One of the key features of this device is the GPS system which would be programmable with voice commands. The EyeSphere navigates the user to the destination in a safe manner by using sensors to avoid obstacles and warn the user of any potential dangers. The project is presented both in terms of a technology roadmap as well as a potential technology venture.

Development Timeline

Freshman Year 2013-14	Concept generation and initial business planning. Course: ENGR 1080
Sophomore Year 2014-15	Concept refinement, filing a provisional patent application, initial discussions with prospective partners. Begin developing software. Course: CSSC 1710
Junior year 2015-16	Finalize the physical design, create prototypes for initial field testing (without software), file utility patent application. Courses: MENG 4920, MENG 3900
Senior year 2016-17	Develop software and pilot software testing in real application. Courses: MENG 4930/50, MENG 3920, Technical Electives.

Total Market Size

- 2011 NHIS
  - 21.2 million American adults have "trouble seeing"
- 285 million worldwide visually impaired
  - 39 million completely blind

Customer Archetype

- The customer archetype is a visually disadvantaged individual who:
- has a strong sense of independence;
- shops based on long-term value;
- is savvy about accessing online distribution channels;
- and, who can afford a $2000 assistive technology device.

Potential Alliances

- Orbotix, makers of the Sphero robotic ball
- University of Detroit Mercy
- National Federation of the Blind
- American Foundation for the Blind
- Guide Dogs of America
  - Have Eyesphere option in case dog is not compatible with human
- A cell phone company

Technology Roadmap

- Determine appropriate sensors given cost, weight and packaging constraints.
- Develop navigation algorithm and prototype on a regular computer.
- Build a fully operational mechanical prototype.
- Conduct initial field testing and refine algorithms and software.
- Map software onto a smartphone app.
- Integrate sensors into physical device and design for packaging.

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