



Abstract

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PI Title: PRINCIPAL RESEARCH ASSOCIATE

Project Title: BLIND PEDESTRIANS' ACCESS TO COMPLEX INTERSECTIONS

Abstract: *The central aims of the proposed bioengineering research partnership (BRP) are: to use the strengths of a multi-disciplinary team to understand the perceptual and cognitive requirements of negotiating complex intersections without vision and with low vision; to design and test engineering and training solutions to problems of information access that are currently known and that are identified in the course of this partnership; and to produce materials about the problems and solutions that are useful to transportation engineers, individuals with visual impairments, and rehabilitation and clinical personnel. The BRP will focus on intersections that are complex by virtue of their size, shape, and/or signalization. The partnership will involve teams of engineers, rehabilitation professionals, and experimental psychologists from Western Michigan University (WMU), the University of North Carolina's Highway Safety Research Center (UNC-HSRC), Vanderbilt University (VU), Boston College (BC), and the Maryland School for the Blind (MSB). Pedestrian safety has been recognized as a major public health concern. For pedestrians with blindness and low vision, many of the traditional approaches to negotiating intersections are no longer effective, and this has led to increased personal risk and to the potential for decreased quality of life. It is essential that blindness researchers work collaboratively with engineers in order to find ways to address real needs and to realistically deal with the human interface requirements of access technology for persons with visual impairments. The lead institution for the partnership is Western Michigan University, and there will be collaboration across teams on most projects. The University of North Carolina's Highway Safety Research team will provide transportation engineering support to the other teams of researchers and will take the lead in the dissemination activities of the partnership. The Boston College team will investigate*

characteristics of accessible pedestrian signals, with the goal of developing more useful signals. The Vanderbilt team will also work to develop more useful pedestrian signals and will conduct basic acoustics research about the perception of moving sound sources as this relates to street crossing. In addition, they will develop a two-speaker auditory motion display as a research and training tool. The Maryland School for the Blind team has specific expertise in low vision mobility and will conduct research concerning eye gaze strategies and mental effort during street crossings. The WMU team will investigate street crossing behavior at roundabout intersections, the effects of various detectable warning materials on nonvisual street detection and on the safety of persons with other mobility impairments, and the use of tactile cues for street-crossing alignment. WMU engineers and blind rehabilitation faculty also will also develop the "Anti-Veering Training Device" to reduce veering during street crossing.

Thesaurus Terms:

*biomedical equipment development, blindness, visual perception
blind aid, gait, quality of life, sound perception, vehicular accident
bioengineering /biomedical engineering, clinical research, human subject*

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