An Assistive Device for Visually Impaired Swimmers

Trevor Gelowsky, Ramzi Marjaba, Catalin Patulea, James R. Green, Andrew E. Marble
Department of Systems and Computer Engineering - Carleton University

Many visually impaired athletes enjoy competitive swimming, however they require an external signal when approaching the lane ends. Currently, this is accomplished using two dedicated volunteers per swimmer, armed with a long stick to tap the swimmer's head. Novice swimmers also require guidance to stay centered within their lane. The present study aims to develop a prototype system to automatically alert a swimmer when they are approaching the lane ends and buoy lines. The problem is solved via three subsystems: 1) a means to detect the swimmer's position relative to the lane boundaries, 2) a wireless transmission channel between the base station and the swimmer, and 3) a device worn by the swimmer to communicate position information. All of these systems must operate in real-time and be resilient to component failure. This paper will describe our solution to the three subsystems listed above and provide a description of the initial prototype to be tested by our 12 year-old client.