

## **Fuzzy matching scheme for stereo vision based electronic travel aid**

Navigation is a significant barrier to individuals with visual impairments. In response to this barrier, a wearable stereo-vision system was investigated and a prototype system named Stereo Vision based Electronic Travel Aid (SVETA) has been developed. Stereo cameras are employed in the SVETA in order to provide information about orientation, distance, shape and size of the obstacles or objects in front of the user. Stereo vision has long been one of the central problems in computer vision, and stereo matching is the most important and critical issue of stereo vision. In this paper, similarity measure for stereo matching based on fuzzy relations is used to establish the correspondence in the presence of intensity variations in stereo images. The strength of relationship of fuzzified data of the windows in left and the right images of stereo pairs is determined by considering the appropriate fuzzy aggregation operators. However, these measures fail to establish correspondence over the occluded pixels. Left/Right consistency check is performed to overcome these problems. The final disparity map is then conveyed to the blind user through musical tone based image sonification. Experiments with standard and real time images have been conducted to demonstrate the effectiveness of the algorithms.