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Vision based intelligent guidance system for blind

S. Pathirana[1]*, J.G. Samarawickrama[2] and A.S. Karunananda[3]

[1]*Artificial Intelligence Laboratory, Department of Computational Mathematics, University of Moratuwa, Moratuwa, Sri Lanka*
[2]*Department of Electronic & Telecommunication Engineering, University of Moratuwa, Moratuwa, Sri Lanka*
[3]*Department of Computational Mathematics, University of Moratuwa, Sri Lanka*

This describes the implementation of an innovative intelligent computer program that provides vocal instructions to safeguard a blind pedestrian from incoming moving obstacles such as vehicles. Since it is a fundamental requirement to recognize hazardous moving objects beforehand to produce (vocal) instructions to avoid them, an intelligent computer program was especially developed to recognize dynamic objects by applying a technique called 'optical flow' and capable of predicting the motion path of detected dynamic objects with an innovative technique named Fuzzy Mathematical Modeling. An Artificial Intelligence technique: a Fuzzy Mathematical Model (FMM) that relies on the study of apparent (observed) size variation of the dynamic object. (According to research findings, a fuzzy-mathematical relationship that exists between the m component value and the skewness of apparent size variation graph was discovered, later fetched to a fuzzy-membership function. In addition, it was observed that the c value maintains a relationship in fuzzy-mathematical nature, with both factors m and the initial apparent size of the object; due to a derived relationship.) Therefore, the primary input to FMM is the graph of apparent size change with respective to time, other than the auxiliary input - relative position change on reference frame. These two graphs are prepared by a separate software module named Image Processing Module comprised of efficient image processing enhanced with artificial intelligence techniques. The functionality of Image Processing Module was further improved by applying mathematical and statistical approaches such as density based clustering. Once the motion path of dynamic object is known, the possibility of determining the safety precautions is obvious. The experimental results prove that the precision of the FMM is approximately 92%. This implies that the researchers have achieved their objectives defined in the postulation stage successfully with significant research findings.

Key words: Artificial Intelligence, computer vision, Fuzzy- Mathematical Modeling

*suneth@dcs.ruh.ac.lk