A novel approach to human motion estimation with applications in human-robot safety

ABSTRACT

Assistive robotics has brought convenience especially to disabled and handicapped including the blinds. Mobile housekeeping robots such as floor cleaners are capable of local obstacle avoidance. However there is always a risk of hitting moving obstacles or blind human when they walk through the environment. In this article, a new decision mechanism is introduced for modelling path planning strategies adopted by blind travellers including wall-following, and taking shortcuts in indoor spaces e.g.; home, and office. A statistical path prediction method is used together with Fuzzy Cognitive Map FCM for prediction of entire paths from partial trajectories. Supplying knowledge from the presented model of spatial cognition and path planning to mobile robots can enhance their motion algorithms for better obstacle avoidance as well as safer service to users with visual impairment and blindness.