

## Motion modelling using concepts of fuzzy artificial potential fields

### ABSTRACT

Artificial potential fields (APF) are well established for reactive navigation of mobile robots. This paper describes a fast and robust fuzzy-APF on an ActivMedia AmigoBot. Obstacle-related information is fuzzified by using sensory fusion, which results in a shorter runtime. In addition, the membership functions of obstacle direction and range have been merged into one function, obtaining a smaller block of rules. The system is tested in virtual environments with non-concave obstacles. Then, the paper describes a new approach to motion modelling where the motion of intelligent travellers is modelled by consecutive path segments. In previous work, the authors described a reliable motion modelling technique using causal inference of fuzzy cognitive maps (FCM) which has been efficiently modified for the purpose of this contribution. Results and analysis are given to demonstrate the efficiency and accuracy of the proposed motion modelling algorithm.

**Keyword:** Motion modelling; Artificial intelligence; Potential fields