

A New Survey on Characterizing Driving Behavior: A Fuzzy Logic Inference Approach

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Abstract-Continuous vehicle tracking as well as monitoring driving behavior, are significant services that are needed by many industries including insurance and vehicle rental companies. The principal goal of this paper is to provide methods to model the quality of the driving behavior based on Fuzzy Inference Systems (FIS). The models consider vehicle dynamics as long as the human behavior parameters, expressed by a set of raw measurements which are obtained from various environmental sensors. In addition, assessment-driving behavior model is simulated and analysed by two particular FISs: Mamdani and Sugeno-TSK. The simulation results illustrate the critical distinctions between the two FISs using the proposed driving behavior models. These differences are based on various processing times, robust behavior of the FISs, outputs MFs, fuzzification-techniques, flexibility in the systems design and computational efficiency.

Keywords— Qualifying Driving Behavior, Fuzzy Inference Systems (FIS), Mamdani type, Sugeno-TSK type, Membership Functions (MFs)