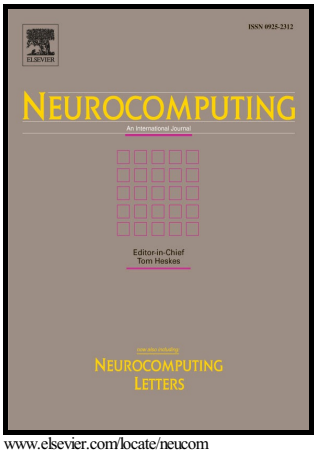

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PII: S0925-2312(16)31168-7
DOI: http://dx.doi.org/10.1016/j.neucom.2016.10.006
Reference: NEUCOM17618

To appear in: *Neurocomputing*

Received date: 28 December 2015
Revised date: 16 September 2016
Accepted date: 12 October 2016

Cite this article as: Jun Ho Chung, Jung Min Pak, Choon Ki Ahn, Sung Hyu You, Myo Taeg Lim and Moon Kyou Song, Particle Filtering Approach t Membership Function Adjustment in Fuzzy Logic Systems, *Neurocomputing* http://dx.doi.org/10.1016/j.neucom.2016.10.006

Particle Filtering Approach to Membership Function Adjustment in Fuzzy Logic Systems

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Abstract

The fuzzy logic system has been a popular tool for modeling nonlinear systems in recent years. In the fuzzy logic system, the shape of the membership function has a significant effect on the modeling accuracy. Thus, membership function adjustment methods have been studied and developed. However, in highly nonlinear systems, the existing membership function adjustment method based on the extended Kalman filter (EKF) may exhibit poor performance due to the linearization error. In this paper, to overcome the drawback of the EKF-based membership function adjustment (EKFMFA), we propose a new membership function adjustment method based on the particle filter (PF). The proposed PF-based membership function adjustment (PFMFA) does not suffer from performance degradation due to the

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