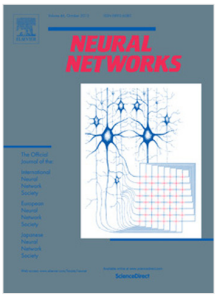
Accepted Manuscript



Design of double fuzzy clustering-driven context neural networks

Eun-Hu Kim, Sung-Kwun Oh, Witold Pedrycz

PII: S0893-6080(18)30111-4
DOI: https://doi.org/10.1016/j.neunet.2018.03.018
Reference: NN 3926

To appear in: *Neural Networks*

Received date : 25 August 2017
Revised date : 19 March 2018
Accepted date : 27 March 2018

Please cite this article as: Kim, E., Oh, S.-K., Pedrycz, W., Design of double fuzzy clustering-driven context neural networks. *Neural Networks* (2018), https://doi.org/10.1016/j.neunet.2018.03.018

Design of Double Fuzzy Clustering-driven Context Neural Networks

Eun-Hu Kim[1], Sung-Kwun Oh[1], and Witold Pedrycz[2,3,4]

[1]Department of Electrical Engineering, The University of Suwon, San 2-2 Wau-ri, Bongdam-eup, Hwaseong-si, Gyeonggi-do, 445-743, South Korea

[2]Department of Electrical and Computer Engineering, University of Alberta, Edmonton, AB T6G 2G6, Canada and

[3]Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland

[4]Department of Electrical and Computer Engineering, Faculty of Engineering, King Abdulaziz University, Jeddah, 21589, Saudi Arabia

In this study, we introduce a novel category of double fuzzy clustering-driven context neural networks (DFCCNNs). The study is focused on the development of advanced design methodologies for redesigning the structure of conventional fuzzy clustering-based neural networks. The conventional fuzzy clustering-based neural networks typically focuses on dividing the input space into several local spaces (implied by clusters). In contrast, the proposed DFCCNNs takes into account two distinct local spaces called context and cluster spaces, respectively. Cluster space refers to the local space positioned in the input space whereas context space concerns a local space formed in the output space. Through partitioning the output space into several local spaces, each context space is used as the desired (target) local output to construct local models. To complete this, the proposed network includes a new context layer for reasoning about context space in the output space.