

Abstract

Based on data from the Ministry of domestic affair Indonesia until 2010 PDAM's customer in Indonesia as many as 7,591,077 customers [1]. Until now we find that the record amount of discharge water usage by customers with a PDAM meter, and then it's corrected by employee who visit to customer's home every month. With this mechanism often found mistakes done by employee for make record PDAM meter manually[2]. For solve this problem, made one system that automatically read PDAM meter by foto.

To find location of block number automatically, can be done with find difference block number area with other area on PDAM meter. that difference is block number area had greatest rectangular area on PDAM meter. After that, crop block number area, get number's gambar on blok number area and change into vector size 900x1. And then classification number's gambar according to number class from 0 to 9 with Backpropagation algorithm. To accelerate learning process and execution Backpropagaion can be used Linear Discriminant Analysis (LDA) as feature extraction. LDA be used because it is able to maximize differences between classes and minimize difference whitin class [4][5][6]. With LDA got eigen value to make PC as velocity on this system.

At implementation stage, sought best parameter for Backpropagation with some experiments to 300 training data and 50 testing data. So, finally get best parameter hidden neuron = 100 , learning rate = 0.1 and epoch 100. With these parameters the system was able to get 100% accuracy in all the data training data and testing data. But time for training process very long time, that is 11414.0371 seconds. After merging with LDA at PC value 7, the system only takes 108.5468 seconds for training process and enable to get accuracy 100% in data training. To prove farther, be tested 50 different photos PDAM meter with combination LDA and Backpropagation and only Backpropagation system whitout LDA. With combination LDA and Backpropagation get accuracy 98%, average execution time 0.007252 seconds and Backpropagation without, get accuracy 100% average execution time 0.010426 seconds. So with combination LDA and Backpropagation in system can reduce training time up to 99,05% and also this combination can reduce execution time up to 30,44% and hold high accuracy.

Keywords: Classification, Backpropagation, PDAM Meter, feature extraction, Linear Discriminant Analysis (LDA).