

ABSTRACT

IDENTITY DETECTION OF SINGLE PHASE DIGITAL KWH METERS USING ARTIFICIAL NEURAL NETWORK AND TEMPLATE MATCHING

By

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Kilowatt hour meter is a tool to measure the amount of energy usage in customers used by PT PLN (Persero). Over time, some problems often occur with Kwh meter such as voltage drop, broken keypad, and dead LCD screen. Data collection of damaged Kwh meters is done manually by recording them one by one it requires considerable time. The process of recording broken Kwh meters includes the brand, number of meters and year of product. Utilization of artificial neural network methods can detect brands and template matching method can detect meter numbers and Kwh meter years. This research uses 3 cameras that have different resolutions, sequentially the Logitech C922 webcam camera, NYK A96 webcam, and iPhone Xr cellphone. The program successfully detected the brand with error 0%. The meter number detection results using the Logitech C922 webcam have an average error of 5.30%, the NYK A96 webcam has an average error of 9.59%, and the iPhone Xr mobile phone has an average error of 0.75%. Year detection results using the Logitech C922 webcam have an average error of 35.41%, the NYK A96 webcam has an average error of 26.38%, and the iPhone Xr mobile phone has an average error of 4.86%. The resolution of the camera used has an effect on the detection results, the greater the resolution of the camera used can reduce the error value in the detection results with the position of taking the image of the front view of the tilted Kwh meter. The Sanxing brand is the best. It has small error then other.

Keyword : Artificial Neural Network, Single Phase Digital Kwh Meter, Template Matching

ABSTRAK

DETEKSI IDENTITAS KWH METER DIGITAL SATU FASA MENGUNAKAN *ARTIFICIAL NEURAL NETWORK* DAN *TEMPLATE MATCHING*

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Kilowatt hour meter merupakan alat untuk mengukur jumlah pemakaian energi pada pelanggan yang digunakan oleh PT. PLN (Persero). Seiring waktu pemakaiannya, beberapa masalah sering terjadi pada Kwh meter seperti tegangan drop, keypad rusak, dan layar LCD mati. Pendataan Kwh meter rusak dilakukan secara manual yakni dengan mencatatnya satu per satu sehingga memerlukan tenaga dan waktu yang cukup lama. Proses pendataan Kwh meter yang rusak meliputi merk, nomor meter dan tahun Kwh meter. Pemanfaatan metode *artificial neural network* dapat mendeteksi merk dan metode *template matching* dapat mendeteksi nomor meter dan tahun Kwh meter. Penelitian ini menggunakan 3 kamera yang memiliki perbedaan resolusi yakni kamera *webcam* Logitech C922, *webcam* NYK A96, dan *handphone* iPhone Xr. Program yang dibuat berhasil mendeteksi merk dengan nilai *error* 0%. Hasil deteksi nomor meter menggunakan *webcam* Logitech C922 memiliki rata-rata *error* 5,30%, *webcam* NYK A96 memiliki rata-rata *error* 9,59%, dan *handphone* iPhone Xr memiliki rata-rata *error* 0,75%. Hasil deteksi tahun menggunakan *webcam* Logitech C922 memiliki rata-rata *error* 35,41%, *webcam* NYK A96 memiliki rata-rata *error* 26,38%, dan *handphone* iPhone Xr memiliki rata-rata *error* 4,86%. Resolusi kamera yang digunakan berpengaruh pada hasil deteksi, semakin besar resolusi kamera yang digunakan dapat mengurangi nilai *error* pada hasil deteksi dengan posisi pengambilan citra tampak depan Kwh meter yang miring. Kwh meter merk Sanxing merupakan Kwh meter yang terbaik, karna memiliki nilai *error* rendah dibanding merk lain.

Kata kunci: *Artificial Neural Network*, Kwh Meter Digital Satu Fasa, *Template Matching*