

ABSTRAK

Identifikasi Penghuni Rumah berdasarkan Pengenalan Pola Suara dengan menggunakan Metode *K-Nearest Neighbor* (K-NN)

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Sistem identifikasi dapat diterapkan pada berbagai bidang, baik keamanan, pendidikan, maupun hiburan. Ada berbagai macam cara identifikasi, salah satunya melalui suara. Contoh identifikasi berbasis sinyal suara adalah identifikasi penghuni rumah. Pada penelitian ini digunakan metode *K-Nearest Neighbor* (KNN) dengan tiga buah ekstraksi ciri untuk membedakan suara penghuni rumah dengan yang bukan penghuni, yaitu *Mel Frequency Cepstral Coefficient* (MFCC), *Zero Crossing Rate* (ZCR), dan frekuensi dasar. Pada frekuensi dasar data sinyal suara dikelompokkan ke dalam *voiced speech* dan *unvoiced speech*. Validasi data penelitian ini menggunakan *10-fold cross validation* untuk mengetahui kinerja dari sistem. Sistem identifikasi penghuni rumah dengan menggunakan tiga ekstraksi ciri, dihasilkan rata-rata akurasi sebesar 90% dan pengujian *online* dengan tiga kali percobaan dihasilkan akurasi sebesar 58%.

Kata kunci : Identifikasi Penghuni Rumah, *Mel Frequency Cepstral Coefficient*, ZCR, Frekuensi Dasar, *K-Nearest Neighbor*.

ABSTRACT

Identification of House's Occupant based on Voice Recognition using K-Nearest Neighbor (K-NN)

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Identification system can be applied to many fields such as security, education, even entertainment. There are various methods to identify, one of it is through speech. Examples of identification based on speech signals are identification of house's occupant. In this study, the K-Nearest Neighbor (K-NN) method is used with three feature extractions to distinguish the voices of occupant with non-occupant, which are Mel Frequency Cepstral Coefficient (MFCC), Zero Crossing Rate (ZCR), and fundamental frequency. For the fundamental frequency the voice signal data is grouped into voiced speech and unvoiced speech. Ten-fold cross validation is applied in our experiment. Using three features mentioned, our proposed method successfully obtained 90% of accuracy. However, the accuracy was dropped to 58% when the system was tested in the real environment.

Keywords: *Identification of House's occupant, Mel Frequency Cepstral Coefficient, ZCR, Fundamental Frequency, K-Nearest Neighbor.*