

2019 SAUPEC/RobMech/PRASA Conference Bloemfontein, South Africa, January
28-30, 2019

Automatic Speaker Recognition System based on Machine Learning Algorithms

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Abstract

Speaker recognition is a technique used to automatically recognize a speaker from a recording of their voice or speech utterance. Speaker recognition technology has improved over recent years and has become inexpensive and a reliable method for person identification and verification. Research in the field of speaker recognition has now spanned over five decades and has shown fruitful results, however there is not much work done with regards to South African indigenous languages. This paper presents the development of an automatic speaker recognition system that incorporates classification and recognition of Sepedi home language speakers. Four classifier models, namely, Support Vector Machines, K-Nearest Neighbors, Multilayer Perceptrons (MLP) and Random Forest (RF), are trained using WEKA data mining tool. Auto-WEKA is applied to determine the best classifier model together with its best hyper-parameters. The performance of each model is evaluated in WEKA using 10-fold cross validation. MLP and RF yielded good accuracy surpassing the state-of-the-art with an accuracy of 97% and 99.9% respectively, the RF model is then implemented on a graphical user interface for development testing.