



Contribution ID: 2

Type: **Poster (sponsored)**

Towards the Development of an Automatic Speaker Identification System for Biometric Access Control

In today's digital age, almost every aspect of life is either supported or influenced by computer-based and information systems (i.e., the ways people communicate with each other, the cars they drive, the appliances they own, the medical facilities they visit, even the places they live and work around). The digital age leads to access control (information security) being the most interesting area of research, and thus far, several approaches have been proposed, with biometric recognition being the most effective approach for access control. Biometric recognition is a way to authenticate access by capturing, analysing and comparing some behavioural and physiological components of a human being. These components include features from face, iris, fingerprints, palm and voice. With biometrics, access control is part of an individual – a measureable physiological or behavioural feature or characteristic, which is often more difficult to fake, steal or imitate than a password or a token. Users do not have to remember it and cannot forget it at home by accident. Voice is the only biometric that allows users to authenticate remotely. A number of speaker (or voice) recognition systems have been proposed and developed around the world, however, very few attempts have been made on the development of speaker recognition systems using South African under-resourced languages.

This study proposes to develop a voice recognition system that will integrate speaker classification and identification using the Sepedi and Xitsonga National Centre of Human Language Technology (NCHLT) speech corpora obtained from Language Management Resource Agency. We chose Sepedi and Xitsonga because they are South African languages that are largely spoken in the Limpopo province of South Africa. Census 2011 reports that Sepedi is the language spoken by most persons in Limpopo with more than 2.8 million speakers, followed by Xitsonga with approximately 1 million speakers.

HPC Content: This study will make use of HPC applications such as Kaldi-asr toolkit

Presenter Biography

Tumisho Billson Mokgonyane received his Honours degree (Computer Science) at the University of Limpopo in 2016. He is currently studying towards his M.Sc (Computer Science) degree at the same institution. His research interests are natural language processing, language learning, machine learning, biometric recognition and programming languages.

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Session Classification: Poster session

Track Classification: HPC Techniques and Computer Science