

OPINION

on a dissertation thesis on a topic SPEECH DETECTION IN SPEAKER RECOGNITION SYSTEMS,

author Atanas Petrov Uzunov,

**for obtaining a PhD degree in the professional field 4.6 "Informatics and Computer Science" and code
01.01.12 "Informatics"**

Jury Member: Corr.-member Prof. Stefan Hadjitodorov

It is an indisputable fact that the solution of various problems and tasks related to biometric technologies and their application in recent years has been intensively developed in many countries around the world. Voice as one of the main characteristics of humans is one of the most studied biometric features. The research is conducted in several directions: detecting and separating speakers by analyzing multiple calls; speaker verification (authentication of a voice); speaker recognition in various fields, especially in forensics. In all of these areas, the system always includes one mandatory module - a voice activity detector, which detects the speech segments and transmits them for further processing. The dissertation is devoted to problems and tasks related to speech detection. This gives me reason to consider the relevance of the proposed dissertation undeniable. The aim of the dissertation is to develop and propose robust features for speech detection that can be applied for various speaker recognition tasks with a voice signal recorded over a telephone channel. In my opinion, the main goal and the tasks set for achieving it are well defined and realistic.

The dissertation consists of an introduction, five chapters, a summary of the results obtained, containing the contributions of the dissertation, a conclusion and guidelines for future work, a list of publications on the dissertation and a list of used literature.

Chapter 1 is of theoretical nature and contains an analytical overview of basic speech detection algorithms in speaker recognition systems. Chapter 2 motivates and proposes three speech detection features using the delta spectral autocorrelation function (DSAF obtained by original, author's application of a delta filter to the spectral autocorrelation function), namely - mean delta feature, basic mean delta feature, and modified mean delta feature. After combining the properties of the DSAF and the modified group delay spectrum, a group delay mean delta feature is proposed in two modifications - defined in a linear and logarithmic scale. Chapter 3 experimentally examines the effectiveness of the five features proposed in Chapter 2 against selected benchmarks (reference features) for text-dependent speaker verification. An approach for voice endpoint detection is also proposed. Chapter 4 experimentally examines the effectiveness of the five traits suggested in Chapter 2 against selected reference features with text-independent speaker identification. The study was implemented with two different algorithms for detecting speech - for features in vector and scalar form. Chapter 5 describes the corpus of voice data in Bulgarian, recorded over a telephone channel and intended for speaker recognition.

The author has presented 6 publications in connection with the dissertation - five in international journals, published in Bulgaria with an international editorial board and one publication, in proceedings of an international conference. A list of 25 citations to three of the publications is given.

I accept the contributions as the author has formulated them. They are short and clear. The abstract reflects the content of the dissertation sufficiently.

I have no critical notes on the thesis.

In conclusion, I think that the proposed thesis meets the requirements of the Academic Staff Development Law, the Rules for its implementation and the Rules for the conditions and procedures for acquiring academic degrees and occupying academic positions in BAS and IICT-BAS. Specific scientific and applied scientific contributions have been achieved. The results were made available to the scientific community through a number of publications. This gives me reason to suggest to the venerable Scientific Jury to award the educational and scientific degree "PhD" in the professional field 4.6 "Informatics and Computer Science" and the code 01.01.12 "Informatics" of Atanas Petrov Uzunov.

03/05/2020,

Sofia city

JURY MEMBER:



(Corr.-member Prof. Stefan Hadjitodorov)