

REVIEW STATEMENT

on the competition for the academic position of "Professor" in
Professional field: 4.6 Informatics and computer sciences,
announced in State Gazette no. 45 / 28.05.2021

The only candidate in the competition is Assoc. Prof. Stoyan Milkov Mihov

Presentation of the candidate and his documents

The following documents for participation in the competition are submitted: CV, copies of diplomas for scientific degrees: "Doctor" and "Doctor of Science", list of scientific publications and citations of them presented for the competition, author's review of publications presented for the competition and a review of the candidate's original scientific achievements, resumes of the publications submitted for the competition and a recommendation by Prof. Dr. K. Schultz, Ludwig-Maximilians-University, Munich, Germany. In addition to these documents, all the necessary other references and declarations are presented, as well as the scientific publications themselves.

Stoyan Mihov has been graduated from the Faculty of Mathematics and Informatics at Sofia University "St. Kl. Ohridski" in 1993, he defended his doctoral dissertation in 2000 at the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences. Stoyan Mihov has obtained the scientific degree of Doctor of Sciences with a dissertation on the topic: Finite state machines, converters and beam machines - algorithmic constructions and implementations in 2020. Since 1995 he has been working at the Institute of Information and Communication Technologies, going through all levels from specialist programmer, assistant, chief assistant and associate professor.

Characteristics of the scientific activity of the candidate

17 scientific publications, one patent and one preprint were submitted for the competition. Four of them are in editions with Impact Factor, five publications are with SJR. Papers are indexed in Scopus. In addition, these scientific papers have not been used in other procedures related to the applicant. Descriptions of 213 citations of the publications are provided. The publications are classified in the following areas: finite state machine theory, natural language processing and speech recognition, approximate search, correction and normalization of texts.

- Theory of Finite Automata

The candidate's achievements in this field are presented in publications [1-4]. In [1] an algorithm is presented, which uses a final dictionary for overwriting to build a subsequence converter, which overwrites a given input text. The publication [4] provides an improved version of [1]. In [3] a methodology, which allows the composition of probabilistic transducers with transitions in case of failure with conditional probabilistic transducers with application in speech recognition is presented.

In publication [2] an approach for efficient construction of bimachines, providing an opportunity to study parallel paths in the machine is described. It is proved that the approach is close to optimal in terms of memory.

- Natural Language Processing and Speech Recognition

The candidate's achievements in this field are presented in publications [5-8]. Publication [5] describes the implementation of an automatic speech recognition system using a large dictionary. [6] describes an approach for ranking hypotheses in speech recognition and selecting the first best of them. Paper [7] is dedicated to the creation of a specialized speech corpus, which is used to train the models from paper [5]. Another approach to creating a speech corpus is described in [8]. This corpus was created on the basis of the records from the plenary debates within the National Assembly.

- Approximate search, correction and normalization of texts

The candidate's achievements in this field are presented in publications [9-17]. Papers [9-12] are devoted to the correction of texts by detecting orthographic errors and their correction on the basis of defining proximity measures such as a modified version of the Levenstein distance and the definition of a Universal Levenstein Automaton. In addition, methods for creating dictionaries with typical spelling errors are presented, methods that work without corpora containing spelling errors. A bigram language model was also used to rank the suggestions for correcting the erroneous word forms. The rest of the publications [13-17] present mainly results related to the normalization (modernization) of historical texts - the transition from spelling norm from before 1945 to contemporary spelling.

The patent [18] registers a methodology for analyzing the influence of individual subjects in a given media coverage. It constructs a graph that connects the various subjects in the media environment through relations such as "cited-by", "reflected-in" etc. In this way, the influence of the individual participants in the media environment is assessed.

The main contributions of the candidate are:

- methods for constructing a sub-sequential converter for rewriting text
- efficient algorithm for approximate search
- probabilistic models for generation of alternative candidates using a subsequence converter with transitions in case of failure
- design and implementation of systems for automatic correction of orthographic errors in texts
- approaches to creating speech corpora for training automatic systems

The presented publications and the indicated scientific contributions show that the candidate's research is completely within the professional field 4.6 Informatics and Computer Science, which is the requirement of the competition.

Teaching activity

Stoyan Mihov is a long-term part-time lecturer at the Faculty of Mathematics and Informatics at Sofia University "St. Kl. Ohridski ". He is the supervisor of two successfully defended doctoral students and ten diploma theses.

Participation in projects

Stoyan Mihov has participated in several European projects under the Seventh Framework Program and has led one of them. One significant participation is in the National Scientific Program "Electronic Healthcare in Bulgaria" - e-Health.

Remarks to the candidate

I have no remarks to the candidate.

CONCLUSION

Based on the described contributions of Stoyan Mihov and his overall activity, I believe that he meets all the requirements for holding the academic position of "Professor" and I strongly suggest Assoc. Prof. Dr Stoyan Mihov to be elected as a Full Professor at the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences in the professional field 4.6 Informatics and Computer Science.

24.09.2021

Sofia

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/ Prof. Dr. Kiril Simov /