COIA 2018

PROCEEDINGS

of the 6th International Conference on

CONTROL AND OPTIMIZATION WITH INDUSTRIAL APPLICATIONS

Volume II

11-13 July, 2018
Baku, Azerbaijan

PROCEEDINGS

of the

6th International Conference on

CONTROL AND OPTIMIZATION WITH INDUSTRIAL APPLICATIONS

Volume II

July 11-13, 2018
Baku, Azerbaijan

Editors-in-Chief
Aliev Fikret (Azerbaijan)
Başar Tamer (USA)

Deputy Editor- in-Chief
Safarova Nargiz (Azerbaijan)

Editorial Board
Aidazadeh Kamil (Azerbaijan)
Akbarov Surkhay (Turkey)
Bagirov Adil (Australia)
Colaneri Patrizio (Italy)
Hajiyev Asaf (Azerbaijan)
Kabanikhin Sergey (Russia)
Konstantinov Mihail (Bulgaria)
Lakestani Mehrdad (Iran)
Larin Vladimir (Ukraine)
Mahmudov Nazim (TRNC)
Ozbay Hitay (Turkey)
Patrick Sole (France)
Pogorilyy Sergey (Ukraine)
Ruzhansky Michael (UK)

Executive Editors
Mammadova Gamar (Azerbaijan)
Rusatrmova Lamiya (Azerbaijan)

Editorial Assistants
Hajiyeva Nazile (Azerbaijan)
Huseynova Nargiz (Azerbaijan)

ISBN 978-9952-37-093-5

IAM
Institute of Applied Mathematics

Proceedings of the 6th International Conference on Control and Optimization with Industrial Applications (COIA 2018)

PREFACE

This volume of Proceedings contains selected papers from the 6th International Conference on Control and Optimization with Industrial Applications (COIA 2018) held in Baku, Azerbaijan, on July 11-13, 2018. The conference, which was organized by the Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan, and the Institute of Applied Mathematics of Baku State University has received more than 300 abstracts. Following a review process, 222 of these were accepted for presentation at the conference. We thank all participants for their contributions to the Conference program and for their contributions to these Proceedings.

The topics that are covered in the conference include Control Theory, Optimization, Intelligent Systems, Fuzzy Control, Numerical and Computational Methods, Network and Telecommunications, Mathematical Modelling and Simulation, Applications in Industrial Processes and Economics, and Identification.

Reviewing and evaluating the submitted abstracts to COIA 2018 was a challenging undertaking that relied on the goodwill of many researchers who are experts in the topical areas covered by the conference. More than 65 researchers were involved in that process, and we thank them for their time and effort in reviewing the submissions and in providing useful feedback to the authors, which the final versions of the papers included in these Proceedings have benefited from.

We would like to express our deep appreciation to the conference sponsor, Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan for their financial support.

As this conference is being closed, we look forward to the next one in the series, the 7th International Conference on Control and Optimization with Industrial Applications, which will be held in 2020.

Aliev Fikret
Tamer Başar

Application of the internet of things in oil-gas industry . . . . . *Alakbarov R.G., Hashimov M.A.* 53

Existence and nonexistence of global solutions for nonlinear transmission acoustic problem. . . . . *Aliev A.B., Isayeva S.E.* 56

Mathematical modeling of the nonlinear filtration process of volatile oils to a well in a compacting formation . . . . . *Aliev F.A., Jamalbayov M.A., Hasanov I.R., Veliyev N.A., Alizadeh N.A.* 59

Role of sustainable industrial enterprises in ensuring macroeconomic stability in Azerbaijan Republic . . . . . *Aliyev R.M.* 62

Module Cebosam . . . . . *Aliyev J.S.* 65

Investigation of the quantum spherically symmetric object and some inconsistencies of familiar quantum mechanical relations in case of singular potentials and operators. . . . . *Aliyeva N.SH., Bayramova G.A., Chobanova A.A., Jafarov R.G.* 68

About one bibliometric method as a tool of big data paradigm . . . . . *Aliyeva T., Rzayeva U.* 71

Deep learning for COPD analysis using lung sounds. . . . . *Allahverdi N., Altan G., Kutlu Y.* 74

The problem of optimal control of a hyperbolic system by boundary control actions . . . . . *Asadova J.A.* 77

A study of a spectral problem of the corresponding mixed problem. . . . . *Asadova O.H., Mamedova N.G, Abbasova A.Kh.* 80

An economophysical view of relations between monopoly and competition. . . . . *Askerov S.* 83

Synthesis of suboptimal control in the problem of quick-speed for a one-dimensional equation of thermal conductivity . . . . . *Azamov A.A., Bakhramov J.A.* 86

Heat capacity of electrons in diluted magnetic semiconductor quantum dot . . . . . *Babanli A.M., Ibragimov B.G.* 89

The response of an infinite elastic medium with inhomogeneous initial stresses to moving ring load in a cylindrical cavity . . . . . *Bagirov E.T., Akbarov S.D., Seyfullayev A.I.* 92

Spectral analysis of Sturm - Liouville equation with almost periodic potentials and discontinuous right hand. . . . . *Bahlulzadeh S.* 95

On the increasing of accuracy of power transmission lines modes mathematical modeling . . . . . *Balametov A., Halilov E., Isayeva T.* 98

The bound state solutions of the Dirac equation for Woods-Saxon potential with spin symmetry . . . . . *Badalov V.H.* 101

ABOUT ONE BIBLIOMETRIC METHOD AS A TOOL OF BIG DATA PARADIGM

TARANA ALIYEVA[1], ULVIYYA RZAYEVA[1]

[1]Department of Information Economy and Technologies, Azerbaijan State University of Economics, Baku, Azerbaijan
e-mail: tarana.aliyeva@unec.edu.az

1. Introduction

The use and application of modern methods of objective evaluation for scientists and specialists activities is particularly important for any science. At present, there are no common and among various standards for collecting information about publications. It is known that traditions of publication in various disciplines are very different. Based on this, the paper studies the problems associated with the statistics of scientific publications. In each case the classification and use of the Data Mining mechanism for the integration of data sources in bibliometric is proposedIn this case the classification and use of the Text Mining mechanism as a part of Big Data technologies for the integration of data sources in bibliometric is proposed [1]. Text Mining is a set of technologies and methods designed to extract information from large volumes of text data by automating the obtaining process of necessary information.

Based on the results of theoretical studies carried out by the authors, the level of development of science in each country is determined by three main indicators:qualitative fundamental science, advanced application researches and highly efficient elaboration systems [2]. The study of modern problems of formal and informal scientific communications is always in the focus of world science. Today large-scale databases, such as Google Knowledge Vault, Deep Dive, and Microsoft Academic Graph have been widely used to integrate data from multiple sources. It should be added that the classifiers are not eligible for the science disciplines adopted by the state statistics and the qualifications of scientific specialties.

The precise definition of authors is an important factor in determining the rank of a scientist or researcher, which is relevant to cross-language identification [3].

During processing of text documents by Big Data means like Text Mining a specific question appears: how to improve bibliometry and citation analysis using the obtained data?

Big Data has more data streams with higher speeds, that is why the infrastructure for information collection must provide expected delays in the processing of short and simple queries, operations large volumes of transactions (often in distributed environments), and support the flexible and dynamic data structures.

Quotation indexes and indicators dynamically are used to analyze both publishing strategies and citation of articles. In the latter case, the change in the indicators of the organizations related to scientific activity in higher education and reflects the evolutionary of speed and direction. Working with Text Mining allows us to get out of the framework of metadata used in bibliometry [4].

2. The use of text mining mechanism for the integration of data sources

Lets review the process of removing key concepts from the following text:

The division of Intellectual Property and Science of Thomson Reuters Agency and Web of Sciences platform from Clarivate Analytics published The annual report on journals quoting (JCR) in 2018 that is the worlds most prestigious resource in this area as an evaluation indicators source of peer-reviewed publications and journals with impact factor (IF).

At the Lexical Analyze stage, the text is divided into sentences and lexemes. Every lexeme is searched in the dictionary for the definition of its speech and other features. Such a vocabulary is prepared by experts from the relevant field. In our example lexemes Thomson Reuters and Web of Science, IF and JCR should be identified. Thomson Reuters and Clarivate Analytics are the names of the companies, while the IF and JCR are marked as abbreviations.

At the next stage, other forms, such as specific names are being considered.

Names with different appearance are available in texts. It is fairly easy to identify them by the use of images built on parts of speech, parsing and spelling properties. For example, science-oriented companies can be identified as follows:

By the word *analytic* that can belong to investigation companies;

By the word *latform* referring to technology or innovation.

Company type like Thomson Reuters;

Company type like Clarivate Analytics;

Platform type like Web of Science;

Abbreviations can be defined by a graphical analysis or acronyms that are based on the first letters of the names.

As a result we will get the following structure:

The division of Intellectual Property and Science of [specific name type: company Thomson Reuters Agency] and [specific name type: platform Web of Sciences] from [specific name type: company Clarivate Analytics] published the annual report on journals quoting (JCR) in 2018 that is the world's most prestigious resource in this area as an evaluation indicators' source of peer-reviewed publications and journals with impact factor (IF).Identification of some aspects of syntactic structures simplifies the next phases of facts detection. On the other hand, it is difficult to identify complex structures in the sentence. In this connection, different ways of text analyzing differently solve this issue. Some of them leave this stage, while others analyze the sentences. However, most systems analyze consistent fragments of sentence. They build only structures of the separate sentences fragment precisely defined either its syntax or semantics. The construction of structures for nouns (noun + its modifications) and verb groups (verb + its auxiliary parts) can be an example of such approach. Both types of structures can be constructed using local syntactic information. Moreover, such an approach allows the establishment of large structures of nouns groups in the case of semantic information existence confirming the correlation of the compounds. All these structures are built using the same regular expressions.

Initially, all groups of nouns are marked with the noun sign. As a result, our example will look like this:

[the noun essence: e1 The division] of Intellectual [the noun essence: e2 Property] and [the noun essence: e3 Science] of [the noun essence: e4 Thomson Reuters Agency] and [the noun essence: e5 platform Web of Sciences] from [the noun essence: e6 The company Clarivate Analytics] [verb: published] The annual [the noun essence: e7 report] on [the noun essence: e8 journals] quoting (JCR) in 2018 that is the world's most prestigious [the noun essence: e9 resource] in this [the noun essence: e10 area] as an [the noun essence: e11 evaluation] [the noun essence: e12 indicators'] [the noun essence: e13 source] of peer-reviewed [the noun essence: e14 publications] and [the noun essence: e15 journals] with impact [the noun essence: e16 factor] (IF).

Additional properties can be combined with each of the groups: verb voices, moods and tenses are such features for verb groups. For noun groups this information is about the num

[illegible] of the keyword (for example, for a proper name) and its status (singular or plural). In [illegible], for each group of names, the essence is created. In our example, their number is 16:

[illegible] type: organization, part The division;
[illegible] type: possessions, form Property;
[illegible] type: human activity, knowledge Science;
[illegible] type: company, name Thomson Reuters Agency;
[illegible] type: management, enviroment Platform;
[illegible] type: company, name The company Clarivate Analytics;
[illegible] type: notification, name Report;
[illegible] type: edition, name Journals;
[illegible] type: spare, name Resource;
[illegible] type: part, name Area;
[illegible] type: quality control, name Evaluation;
[illegible] type: feature, name Indicators';
[illegible] type: universe, name Source;
[illegible] type: release, name Publications;
[illegible] type: edition, name Journals;
[illegible] type: indicator, name Factor.

[illegible] of cases and relationships extended and pre-illustrated examples are used. As a [illegible], the text is based on the pre-created essence of events and the list of contents is updated. [illegible] concepts can be obtained through the described method. As a result of local analysis, [illegible] - the essences and the cases - are extracted from the text.

In the case of machine learning, there is an analysis of linguistic templates (lexical proximity, [illegible] of words, etc.) from the training sample of documentation. This example should [illegible] the documentation for each category, so that it is possible to create a collection of [illegible] for each category that will be used later in the classification of new documents (statistical [illegible]). The advantage of this approach is that there is no need for dictionaries, which are [illegible] established for large subject areas. But in order to avoid the wrong classification, it is [illegible] to provide a perfect presentation of each category.

In the context of growing scientific data the development and use of new mechanisms for [illegible], analysis and evaluation is becoming more relevant. The combination of the [illegible] approaches is also possible when selecting and setting rules is automatically done [illegible] on the training example. The information obtained through this bibliometric study can [illegible] effectively in different assessment procedures, and can determine the development or [illegible] of different scientific directions.

Keywords: Word and phrases, lexical analyze syntax and semantics, features.

AMS Subject Classification: 94A99.

References

[illegible] F., Data mining: past, present and future, the knowledge engineering review, *Cambridge University* [illegible] *DOI: 10.1017/S000000000000000*, Vol.2, 2004, pp. 1-24.

[illegible] T., Rzayeva U., Modern technology the main factor of the social development *Azerbaijan Journal of* [illegible], Vol.134, No.2, 2017, pp.99-112.

[illegible] Z.V., Vinokurov P.S., An extension of a visualization component of ontology based portals with [illegible] analytics facilities, *Bulletin NCC. Series: Computer Science*, IIS Special Iss, No.31, 2010, pp.17-28.

[illegible] C.S., Roessner J.D., Bobb K., Klein J.T., Boyack K.W., Keyton J., Approaches to understanding [illegible] measuring interdisciplinary scientific research (IDR): a review of the literature *Journal of Informetrics*, [illegible], No.5, 2011, pp.14-26.

Rasulova M. 205
Rasulova S.R. 247
Rasulova U.Z. 250
Rzayeva I.A. 147
Rzayeva U. 71
Sadigov I. M. 253
Safarova Z.R. 125
Safwan A.S 132
Salavatov T.Sh. 256, 259
Samet R. 262, 265
Sariyev K. 205
Seyfullayev A.I. 92
Shafizade E.R. 268
Shamilova H. 205
Sharifov F.A. 274
Sharifov Y.A. 271
Shimiyev H.V. 277
Suleymanov A.A. 259
Sulisz W. 280
Tagiyev M.M. 283
Tagiyev R.K. 286
Takhirov J.O. 289
Talia Y. 154
Tarverdiyeva V.A. 38
Tasdemir S. 292
Tural S. 265
Ugurlu O. 235
Uzun K. 38
Veliyev N.A. 59
Veliyeva N.I. 295
Yagubova M.M. 299
Yildirim Z. 262
Yuzbekov R.A. 247
Zverkina G.A. 302