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A Review and evaluation of Machine Translation methods for Lumasaaba

Peter Nabende[1][0000-0003-2141-7940]

[1] Department of Information Systems, Makerere University,
P. O. Box 7062, Kampala, Uganda

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Abstract. Natural Language Processing for under-resourced languages is now a mainstream research area. However, there are limited studies on Natural Language Processing applications for many indigenous East African languages. As a contribution to covering the current gap of knowledge, this paper focuses on evaluating the application of well-established machine translation methods for one heavily under-resourced indigenous East African language called Lumasaaba. Specifically, we review the most common machine translation methods in the context of Lumasaaba including both rule-based and data-driven methods. Then we apply a state of the art data-driven machine translation method to learn models for automating translation between Lumasaaba and English using a very limited data set of parallel sentences. Automatic evaluation results show that a transformer-based Neural Machine Translation model architecture leads to consistently better BLEU scores than the recurrent neural network-based models. Moreover, the automatically generated translations can be comprehended to a reasonable extent and are usually associated with the source language input.

Keywords: machine translation, Lumasaaba, data-driven machine translation, phrase-based statistical machine translation, Neural machine translation.

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Neural Network Model for Assessing the Physical and Mechanical Properties of a Metal Material Based on Deep Learning

Andrei Kliuev[1[0000-0002-5168-5252]], Roman Klestov[1[0000-0003-2063-3596]]
Valerii Stolbov[1[0000-0003-3259-8660]]

[1] Perm National Research Polytechnic University, Perm, Russia, 614990

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Abstract. The paper investigates the algorithmic stability of learning a deep neural network in problems of recognition of the materials microstructure. It is shown that at 8% of quantitative deviation in the basic test set the algorithm trained network loses stability. This means that with such a quantitative or qualitative deviation in the training or test sets, the results obtained with such trained network can hardly be trusted.
Although the results of this study are applicable to the particular case, i.e. problems of recognition of the microstructure using ResNet-152, the authors propose a cheaper method for studying stability based on the analysis of the test, rather than the training set.

Keywords: Deep neural networks, material microstructure, image recognition, deep learning, algorithmic stability.

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Multifactorial model of adverse events and medical safety management

Yury Voskanyan[1][0000-0003-2962-2818], Irina Shikina[2,3][0000-0003-1744-9528], Olga Andreeva[2,4][0000-0003-0838-286X], Fedor Kidalov[5][0000-0003-4914-8164], David Davidov[2][0000-0003-4576-6854]

[1] Russian Medical Academy of Continuing Professional Education of the Ministry of Health of Russia, Moscow, Russia, 125993
[2] Central Research Institute for Organization and Informatization of Medical care at the Ministry of Health of Russia, Moscow, Russia, 127254
[3] Central State Medical Academy Office of the President of the Russian Federation, Moscow, Russia, 121359
[4] National Research University Higher School of Economics, Moscow, Russia, 101000
[5] State Government Institution of Moscow City «Informational-Analytical Center for medical care», Moscow, Russia, 107078

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Abstract. The article describes a multifactorial model of adverse events related to the provision of medical care. It is shown that their origin is caused by the transformation of systemic causes (latent failures) acting at the level of medical organization, external microenvironment and macro-factors. Four types of global latent failures are described at the level of a medical organization related to: medical technology, work of medical personnel, work environment, and patient behavior. At the external microenvironment level, major latent threats are concentrated at the level of partners, suppliers and outsourcers. Among macro-factors influencing medical care safety especially important are the legal factors defining the status of medical errors and their consequences; economic model of state health care; financial provision of state guarantees and rationing of these volumes in regions and municipalities; availability of state medical care safety management programs; state regulation of medical activity; system of pre- and post-graduate medical education; system of labor regulation and remuneration of medical workers; society's attitude towards medical errors and its participation in the process of medical care safety management. The authors present an algorithm for implementation of a safety management system in a medical organization, including the construction of a new safety culture, an accounting system for recording of threats and incidents, a model for managing medical care safety built into the operational system of the organization.

Keywords: medical care safety, adverse events, incident, medical care safety management system.

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The influence of FDI on sustainable economic development of Ukraine in terms of global digitization

Svitlana Tkalenko[1][0000-0003-0385-846X], Natalya Sukurova[2][0000-0003-4297-1123]

[1] Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine, 03057
[2] Kyiv National Trade and Economic University, Kyiv, Ukraine, 02156

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Abstract. This article is a research study of the role and necessity of digital transformation of Ukrainian economy in the context of digitization of the world economy, which will promote economic growth and increase the international competitiveness of national economy, which in its turn will contribute to the further formation of an attractive investment environment. The modern tendencies of information economy development are disclosed. Changes of the determinants of FDI in the Ukrainian economy in terms of its digital transformation are revealed. It is proved that foreign trade and the globalization index of the country influence on the process of attracting FDI. Much attention in the article is paid to the role of information, development of information sphere, digitization, formation of a new information economy, foreign direct investments, which are necessary for the economic development of the country and affect economic growth in the context of global digitization. The necessity of this study is due to the modern trends of development in the world economy and the digital transformation of the national economy. The role and importance of foreign direct investments in the digital transformation of the national economy has been proved on the basis of a broad analysis of research works of foreign and national specialists, analysis of economic situation in Ukraine and the main macroeconomic indicators identified the role and necessity of transformation processes, macroeconomic indicators of economic development of the country were analyzed, the necessity and requirements for the formation of an attractive investment environment, favorable investment climate and business environment have been identified. Using the econometric model, based on E-Views software, the indicators of GDP, foreign trade, inflation, employment level and the globalization index have been analyzed in the context of their impact on the volume of FDI attraction and their forecasting have been made.

Keywords: digital transformation, globalization, information economy, information technology, foreign direct investments.

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Development and financial support of tourism exports in the digital economy

Aleksandr Gudkov[1][0000-0002-4006-4522], Elena Dedkova[1][0000-0003-3392-2952]

[1] Orel State University, Orel, Russia, 302020

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Abstract. Tourism is not only big business but also tourism should be seen and protected as perhaps one of the world's premier export products. In this connection, consideration is given to the possibilities of developing the tourism industry as the most important direction of non-primary exports in the medium term in digital age, capable not only of bringing significant revenues to the budgets of various levels, developing domestic tourist infrastructure, but also characterized by inexhaustible resources and forming a favorable image of the country on world markets. The purpose of this article is to consider the problems of preservation and financial support of the travel, tourism and hospitality industry from the standpoint of increasing its export potential in digital age and ensuring a high level of attractiveness of tourist destinations.

Keywords: Tourism, Development, Financial support, Export, Digital economy.

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Financial reporting and climate-related disclosures

Olga Efimova[1[0000-0002-3574-6916]], Olga Rozhnova[1[0000-0002-8955-5904]]

[1]Financial University under the Government of the Russian Federation, Moscow, Russia, 125993

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Abstract. The article examines disclosures on climate-related risks in financial statements. The conducted study has analyzed corporate reports (financial, integrated, environmental, on sustainable development) of leading Russian metallurgical companies that consider climate change influence or environmental impacts as the most significant. The following conclusion is derived from conducted research. Majority of climate-related disclosures are currently made in broader corporate reports, primarily in ecological, social responsibility and sustainable development reports. There is almost no information about climate-related risks in financial statements, and there are no corresponding cross-references on environmental issues between financial and non-financial reports. Climate-related risks impact most important indicators of financial statements, corporate strategy and business model. Materiality of information on climate change impact on companies` financial position, performance and cash flows need to be considered in the context of financial statements. The aim of the study is to confirm the materiality of climate-related risk disclosure for interested users, existing insufficiency of such disclosures in financial statements and make proposals on filling the identified information vacuum. The article offers recommendations on feasibility of developing a new standard "Climate risks: Disclosures", which should provide users with essential information on the judgments and assumptions related to assessment of climate-related risks` impact on financial statements.

Keywords: financial and non-financial reporting, climate-related risks disclosures, financial consequences of climate-related risks.

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Digital universities in Russia: digitization with extra speed

Darya Rozhkova[1[0000-0002-0500-2908]], Nadezhda Rozhkova[2[0000-0001-8419-8007]], Uliana Blinova[1[0000-0001-5557-4763]]

[1] Financial University under the government of the Russian Federation, Moscow, Russian Federation, 125993
[2] State University of Management, Moscow, Russia, 109542

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Abstract. The education sector is subject to significant changes due to the increasingly active spread of digital technologies. Usually, the trends in the implementation of digital technologies in educational and research activities are set by commercial organizations – private universities, business schools, corporate universities. But public universities and institutions start to think more and more about digital transformation. However, evolutionary path of universities' digitization was destroyed by the spread of Coronavirus (COVID-19). It was decided to completely close universities, all students started to study from home. In this paper, we aimed to start a discussion about distance learning satisfaction among professors and lecturers; understand their vision about e-learning and the current stage of universities' digitization. After examination of the current state of university digitization, we have identified major problems which become an obstacle during pandemic.

Keywords: Digital technologies, digitization, digital university.

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Model of the communication process in a context of reading in French first language and French foreign language

Julia Belyasova[1][0000-0001-6983-2129], Michel Martin[2]

[1] The Louvain Catholique University, Louvain, Belgium
[2] The DeVisu laboratory of Hauts-de-France Polytechnic University of Valenciennes, Valencia, France

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Abstract. This article aims to analyze, from a didactic point of view, readings offered to students of several schools in Belgium and the choices made by their teachers to support them in their task. This article is devoted to examining the methods used by teachers, explaining why and how they use them, and looking for consistency in their teaching practices. This data, based on theoretical axes, makes possible to know and identify the elements that make teaching devices effective. This research is therefore oriented towards the creation of a model representing the original operating mode on which the students in the French first language and the French foreign language classes worked.

Keywords: meta-communication, pedagogical model, mediations, stereotypes, reading.

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Aims and Objectives
Published online by Institute of Certified Specialists two times a year, the Journal of Digital Science (JDS) is an international peer-reviewed journal which aims at the latest ideas, innovations, trends, experiences and concerns in the field of digital science covering all areas of the scholarly literature of the sciences, social sciences and arts & humanities. The main topics currently covered include: Artificial Intelligence Research; Digital Economics, Education, Engineering, Finance, Health Care.

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