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Decision Support Sistem

1. Theoretical learning guarantees applied to acoustic modeling.

Christopher D.Shulby, Martha D.Ferreira, Rodrigo F.deMello and Sandra M.Aluisio (2019).

- a. Most speech-processing applications rely on acoustic models which build the bridge between the audio signal and its phonetic transcription. After a sentence prompt has been phonetically transcribed, the task of learning which phonemes belong to certain audio segments is far from trivial, but essential to modern speech applications, since problems at this stage are likely to propagate, even with the help of a robust language model. For automatic speech recognition (ASR), it is essential that phonemes are transcribed completely and in the correct order; in other words, all phonemes in sequence should be recognized.
- b. Besides the training time, the real problem lies in the availability of training data for under-resourced languages or specific applications. On the other hand, the complexity of neural network models, especially in bruteforce approaches, can be a problem, since they can require huge corpora.

2. Searching contexts in paraconsistent rough description logic.

Henrique Viana, Joao Alcantara and Ana Teresa Martins.

- a. We propose two algorithms to settle this problem of query refinement in PR ALC and show their complexity results.
- b. The problem of query restrictions using contextual approximation is proved to have exponential time complexity, while the problem of query relaxations has polynomial space complexity.
- c. We present a method to obtain optimized query refinements of assertion axioms in the paraconsistent rough description logic PR ALC, a four-valued paraconsistent version of the rough ALC, which is grounded on Belnap's Logic. This method is based on the notion of the discernibility matrix commonly used in the process of attribute reduction in the rough set theory. It consists of finding sets of concepts which satisfy the rough set approximation operations in assertion axioms. Consequently, these sets of concepts can be used to restrict or relax queries in this logic.

3. Evaluating word embeddings and a revised corpus for part-of-speech tagging in Portuguese.

Erick R Fonseca, Joao Luis G Rosa and Sandra Maria Aluisio (2015)

- a. We tested our classifier in different corpora : a new revision of the Mac-Morpho corpus, in which we merged some tags and performed corrections and two previous versions of it. We evaluate the impact of using different types of word embeddings and explicit features as input.
- b. We compare our tagger's performance with other systems and achieve state-of-the-art results in the new corpus. We show how different methods for generating word embeddings and additional features differ in accuracy.
- c. The work reported here contributes with a new revision of the Mac-Morpho corpus and a state-of-the-art new tagger available for use out-of-the-box.

4. On the parallel efficiency and scalability of the correntropy coefficient for image analysis.

Aluisio I Rego Fontes, Samuel Xavier-de-Souza, Adriaio D Doria Neto and Luiz Felipe de Queiroz Silveira.

- a. We propose a parallelization strategy for calculating the correntropy on multi-core architectures that may turn the use of this metric viable in such applications. We provide an analysis of its parallel efficiency and scalability.
- b. The simulation results were obtained on a shared memory system with 24 processing cores for input images of different dimensions. We performed simulations of various scenarios with images of different sizes. The aim was to analyze the parallel and serial fraction of the computation of the correntropy coefficient and the influence of these fractions in its speedup and efficiency.

5. A data warehouse to support web site automation.

Marcos Aurelio Domingues, Carlos Soares, Alipio Mario Jorge and Solange Oliveira Rezende.

- a. A database to store rich web data is an essential component for web site automation. In this paper, we propose a data warehouse that is developed to be a repository of information to support different website automation and monitoring activities. We implemented our data warehouse and used it as a repository of information in three different case studies related to the areas of e-commerce, e-learning, and e-news.
- b. The case studies showed that our data warehouse is appropriate for web site automation in different contexts.

6. Stimuli-SoS : a model-based approach to derive stimuli generators for simulations of systems-of-systems software architectures.

Valdemar Vicente Graciano Neto, Carlos Eduardo Barros Paes, Lina Garces, Milena Guessi, Wallace Manzano, Flavio Oquendo and Elisa Yumi Nakagawa. (2017)

- a. We established a model-based approach termed Stimuli-SoS to support the creation of stimuli generators to be used in SoS simulations. Stimuli-SoS uses software architecture descriptions for automating the creation of such generators. Specifically, this approach transforms SoSADL, a formal architectural description language for SoS, into dynamic models expressed in DEVS, a simulation formalism. We carried out a case study in which Stimuli-SoS was used to automatically produce stimuli generators for a simulation of a flood monitoring SoS.
- b. Our approach succeeded in automatically deriving a functional stimuli generator that can reproduce environmental conditions for simulating a SoS. In particular, we presented new contributions regarding productivity and automation for the use of a model-based approach in SoS engineering.

7. A hybrid particle swarm optimization and harmony search algorithm approach for multi-objective test case selection.

Luciano Soares de Souza, Ricardo Bastos Cavalcante Prudencio and Flavia A. De Barros. (2015)

- a. In this paper, we proposed two MOO algorithms (BMOPSO-CDR and BMOPSO-CDRHS) and present experimental results comparing both with two baseline algorithms : NSGA-II and MBHS. The experiments covered both structural and functional testing scenarios.
- b. The results show better performance of the BMOPSO-CDRHS algorithm for almost of all experiments. Furthermore, the performance of the algorithms was not impacted by the type of testing being used.

8. A combined approach for concern identification in KDM models.

Daniel San Martin Santibanez, Rafael Serapilha Durelli and Valter Vieira de Camargo. (2015)

- a. We have conducted an experimental study composed of two analyses. The first one aimed to identify the most suitable levenshtein values to apply the clustering algorithm. The second one aimed to check the recall and precision of our approach when compared to oracles and also to two other existing mining techniques (XScan and Timna) found in literature.
- b. The main result of this work is a combined mining approach for KDM that enables a concern-oriented modernization to be performed. As a secondary and more general result, this work shows that it is possible to adapt existing concern mining code-level

approaches for being used in ADM processes and maintain the same level of precision and recall.

9. Implementing new technologies in a middle school curriculum: a rural perspective.

Tandra L. Tyler-Wood, Deborah Cockerham and Karen R. Johnson. (2018)

- a. The purpose of this study was to examine the impact of a new school technology on teachers and students in rural middle schools. The study involved teachers and seventh grade students in two Title I rural Texas school districts and was framed through a constructivist lens using a project-based approach. Pre- and post-intervention surveys assessed learning and perceptions, and data were analyzed using one-way Analysis of Variance. Findings suggested that new school technology does not ensure teacher understanding or student learning. For new school technologies to be successful, significant planning, teacher training, and resources must be in place.
- b. Rural middle schools, Technology-integrated instruction, STEM education.

10. Perspectives on how to evaluate augmented reality technology tools for education : a systematic review.

Manoela M. O. Da Silva, Joao Marcelo X. N. Teixeira, Patricia S. Cavalcante and Veronica Teichrieb. (2019)

- a. Education has benefited from augmented reality's (AR) potential to promote interactive experiences both inside and outside the classroom. A systematic review was conducted on how AR's impact in the learning process has been evaluated. We selected papers from 2009 to 2017 in three databases, IEEE, ACM, and Science Direct, using an open-source crawler, and in one Brazilian Conference, SBIE. We followed the PRISMA protocol. Forty-five works were selected and used to extract data for our research. They were also analyzed according to quantitative and qualitative criteria. The results from all the papers are available in an online database. Results evidenced an increase in the number of papers evaluating the AR's impact in education. They also showed that AR has been applied in different areas and contexts. Most papers reported positive outcomes as a result of AR insertion. However, most studies lacked the involvement of the teacher and the use of multiple metrics to evaluate educational gains.
- b. Augmented reality, Evaluation, Educational systems.

11. A smarter knowledge commons for smart learning

Penelope J. Lister. (2018)

- a. This paper takes the form of a discussion relating to a smarter knowledge commons, having come about due to implications arising from research into the development of a pragmatic pedagogical 'guide to learning' for smart learning environments. The paper does not discuss any research findings (which have not yet been established),

but rather is about attempting to discover through examination of early adopter use cases the underlying challenge for smart learning design in relation to the delivery of personalised geo-spatially relevant knowledge. Solutions for the mapping and delivery of the knowledge web are tentatively suggested, making use of an existing meta-property framework, the Open Graph. Smart learning environments focus on learning in geo-spatially relevant learning locations, with tutors or learners engaged in tasks that may frequently require the searching and selecting of knowledge content to contribute to learning or in the further production of new digital knowledge content. This has led to considerations regarding where and how knowledge content is obtained, provided, produced or shared, and this paper examines issues related to the producing, searching and finding of knowledge content in these learning contexts. Practical examples are provided to illustrate how digital knowledge content plays a pivotal role in learning design and learner interactions taking place in smart learning, both for the content of learning and as part of the process for learning. Emphasis is on open access smart learning in relation to connected and collaborative pedagogical approaches. Considering the future development and pedagogies of open-access smart learning environments, we must ask how the knowledge commons, an integral part of this learning, can become 'smarter' for learning and teaching.