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Editorial

THIS ISSUE of the Polytechnic Open Library International Bulletin of Information Technology and Science (POLIBITS) includes ten papers by authors from eight different countries: Cuba, Ecuador, Mexico, Nepal, Peru, Switzerland, Ukraine, and USA. The majority of the papers included in this issue are devoted to the general topic of emerging challenges and trends in business intelligence, including such specific topics as software development, pattern recognition, natural language processing, forecasting, Internet of things, time series analysis, as well as optimization and multi-objective optimization.

A. Castro-Hernández et al. from **USA** in their paper "Collaboration and Content-Based Measures to Predict Task Cohesion in Global Software Development Teams" explore the use of collaboration and content-based measures to examine task cohesion within global software development teams, which a key component of team performance. They use a machine-learning classifier to derive content measures by categorizing the teams' message interactions as social, planning, or work. They show that content-based measures are more effective in predicting individual-level cohesion, and collaboration-based metrics are more effective at the group level.

Bijaya Kumar Hatuwal et al. from **Nepal** in their paper "Plant Leaf Disease Recognition Using Random Forest, KNN, SVM and CNN" classify and predict crop diseases by plant images with a number of machine learning models. For SVM, KNN and Random Forest algorithms, they extracted image features such as contrast, correlation, entropy, inverse difference moments using Haralick texture features algorithm. In contrast, CNN took directly the images as input. Of the classification algorithms they tested, CNN produced the best accuracy by a wide margin.

Olga Kolesnikova from **Mexico** in her paper "Complex System View on Natural Language" studies natural language as a complex adaptive system. She shows that the complex system view on natural language is a powerful tool not only for incorporating linguistic knowledge, but also for studying many open issues in phonetics, grammar, lexicon, language origin and evolution, and first language acquisition and development by simulating the structure and functioning of language using computational models.

Dmitriy A. Klyushin from **Ukraine** in his paper "Non-Parametric k-Sample Tests for Comparing Forecasting Models" provides an overview of the non-parametric tests used in business analysis for pairwise and group comparisons and describes a new, highly reliable, sensitive, and specific, non-parametric statistical test. His test is based on assessing the deviation of the observed relative frequency of an event from its a priori known probability. The prior probability is given by Hill's assumption, and the confidence intervals for the binomial success rate in the Bernoulli scheme are used to estimate its difference from the observed relative frequency. The paper presents the results of computer modeling and comparison of the proposed test with the alternative Kruskal-Wallis test and the Friedman test on artificial and real examples.

Rodolfo A. Pazos et al. from **Mexico** in their paper "Processing Natural Language Queries via a Natural Language Interface to Databases with Design Anomalies" describe an improvement to the processing performed by a domain-independent interface to treat databases with design anomalies and for the interface to be able to process correctly queries involving such anomalies. The problem is novel: existing literature on Natural language interfaces to databases (NLIDBs) has not even mentioned this problem, and much less addressed it. The importance of this problem, and of its solution, stems from the fact that existing NLIDBs would not work correctly for these databases with design anomalies, since these NLIDBs were designed under the assumption that they would be used with databases without anomalies.

Hermann M. Klusmann and **Renzo M. Carnero** from **Peru** and **USA** in their paper "Multicriteria Analysis for IoT Selection in a Telemetry System" propose a multi-criteria optimization study aimed to find the most suitable Internet of Things (IoT) technology for a telemetry network of water meters in a city. Basing on the types of IoT available in the given area, they balance accordingly to technical, social, and economic criteria and obtain the most appropriate IoT technology for the case study.

G. Rivera et al. from **Mexico** in their paper "Forecasting the Demand of Parts in an Assembly Plant Warehouse using Time-Series Models" describe the implementation of time-series models to forecast the demand for parts that could improve the relocation process. For this purpose, they implement different Holt-Winters Seasonal and SARIMA models. For the implementation of the SARIMA models, the follow the Box-Jenkins methodology. They use AIC and BIC metrics to identify the best Holt-Winters Seasonal model and the best SARIMA model. To check that the model is fit to the data, they test their models on the residual series. They use RMSE and MAPE metrics to evaluate the performance of Holt-Winters Seasonal and SARIMA models. They show that the SARIMA model outperforms the Holt-Winters Seasonal model.

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Eduardo Sánchez-Ansola et al. from **Cuba** in their paper "School Bus Routing Problem with Fuzzy Walking Distance" introduce a fuzzy model for the School Bus Routing Problem, particularly with the maximum student walking distance as a fuzzy element. This fuzzy version of the School Bus Routing Problem allows obtaining a set of solutions with different trade-offs between cost and relaxation of the original conditions. The authors analyze the results obtained in 31 instances by using the parametric approach taking into account three characteristics of the problem: number of bus stops, number of students, and walking distance. They show that the fuzzy version of the problem that they introduce is useful for decision-makers, since it provides relaxed alternative solutions with significant cost savings.

Lorena R. Rosas-Solórzano et al. from **Mexico** in their paper "Optimization of Many Objectives with Intervals Applying the MOEA/D Algorithm" propose I-MOEA/D, a new multi-criteria optimization method based on a MOEA/D approach, to deal with decision maker's uncertainty in costs and benefits of portfolios' projects. The novel features of their method include (a) handling large numbers of objectives; (b) a method to generate the initial population; and (c) handling the uncertainty of resources, costs, and benefits through intervals. The authors show competitiveness of their I-MOEA/D approach, which in their experiments with two to fifteen objectives improved the quality of solution of the state-of-the-art I-NSGA-II method in most instances.

Jhonny Pincay et al. from **Switzerland** and **Ecuador** in their work-in-progress paper "Towards a Computational Intelligence Framework to Smartify the Last-Mile Delivery" propose a framework for the improvement of the first-try delivery by studying traffic on the streets and past delivery success as a way of approximating customers' presence at home. In contrast to existing solutions, they work only with data that do not compromise the customers' privacy and get insights about traffic features in cities without the need of deploying expensive equipment to obtain data. Their main goal is to provide a route plan to the delivery team and route planners, which allows finishing the distribution of the parcels in the minimum amount of time, while being able to deliver effectively the highest amount of parcels. This will be translated into lower resource consumption and increased customer satisfaction. Their work follows the principles of design science for information systems.

This issue of the journal will be useful to researchers, students, and practitioners working in the corresponding areas, as well as to public in general interested in advances in computer science, artificial intelligence, and computer engineering.

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Guest Editors