

GJCIE

ABSTRACT BOOK

Global Joint Conference on Industrial Engineering and Its Application Areas - 2018



GJCIE



June 21 - 22, 2018

Perissia Hotel & Convention Center
Urgup-Nevsehir, Turkey

CAPPADOCIA

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Title

Abstract Book of Global Joint Conference on Industrial Engineering and Its Application Areas (GJCIE) 2018
“Industrial Engineering in the Big Data Era”

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WELCOME MESSAGE FROM THE CONFERENCE CHAIR

FETHI CALISIR, PhD

Dean, Management Faculty

Istanbul Technical University, Turkey



On behalf of the Global Joint Conference on Industrial Engineering and Its Application Areas (GJCIE 2017) Organizing Committee, I welcome you to the GJCIE 2018 in Nevsehir, Turkey. The GJCIE 2018 is composed of three co-located conferences: the 3rd Global Conference on Industrial Engineering (GCIE), the 4th Global Conference on Healthcare Systems Engineering and Management (GCHSEM), and the 5th Global Conference on Engineering and Technology Management (GCETM). The GGJCIE 2018 will be an internationally renowned forum for researchers, practitioners, and educators to present and discuss the most recent innovations, trends, experiences, and challenges in the field of industrial engineering. It will bring together experts from academia and industry to exchange the latest research results and trends, and their practical applications in the aforementioned areas of industrial engineering. This will be accomplished through the following two modes of communication: keynote presentation and parallel sessions.

Big data refers to the ever-growing volume of structured and unstructured data, increasing speed in the generation of that data, and increased diversity of types of data. Big data is also a developing topic and has attracted the attention of many researchers and practitioners in industrial engineering. Big data may play an enabling and vital role in the design of products and systems by making them more productive, better connected, more intelligent and autonomous, and extensively accessible. But big data research is still in its early stages. Its focus is rather uncertain and related studies are not well integrated. The Global Joint Conference on Industrial Engineering and Its Application Areas (GJCIE) 2018 will shed light on the role of industrial engineering in the Big Data Era. We have a great program and a fantastic keynote speaker this year.

The GJCIE 2018 will take place from June 21st to June 22nd at the Perissia Hotel & Convention Center in Urgup, Nevsehir, Turkey. Cappadocia named as “land of the beautiful horses” is selected as the conference venue since it is one of the most fascinating and historical places in Turkey. It is also well-known for its wine, valleys, underground cities, carved-from-rock churches & hotels, hot-air balloons, trekking and horseback riding tours. Owing to these prominent features of the place, participants will enjoy their stay besides benefiting from the conference.

I would like to welcome you to the GJCIE 2018 and wish you a wonderful time in Cappadocia!

Best regards,

Fethi Calisir, Ph.D.

Conference Chair

KEYNOTE SESSION

KEYNOTE SESSION

KEYNOTE

MUSTAFA ERGEN, PhD

- Professor at Istanbul Technical University
- Chief Technology Advisor at Turk Telekom

Electronics and Communication Engineering Department, Istanbul Technical University

June 22, 2018 – Room: Sobesos



Entrepreneurship and Technology Innovation: Silicon Valley History and Start of Big Data Era

Abstract

In this talk, entrepreneurship and technology innovation is presented. The talk exemplifies it with the introduction of the Silicon Valley history by emphasizing what makes this place unique among others and how technology revolution has blossomed including the major milestones of Big Data and Artificial Intelligent era.

PARALLEL SESSIONS

PARALLEL SESSION 01 | PS01

PS01.26

June 21, 2018 | 09:30 – 11:00

Determining the Importance Levels for Each Process in Overall Throughput Effectiveness Calculation using Hybrid Evolutionary Algorithm

[Duygu Yilmaz Eroglu](#)

Industrial Engineering Department, Uludag University, Bursa, Turkey

Abstract: Overall Equipment Effectiveness (OEE) is a metric to measure total equipment performance that indicates the degree to which the mentioned equipment is doing what it is supposed to do. While OEE is a powerful TPM tool for measuring individual equipment's effectiveness, additional calculations are required to find whole system's performance level. Overall Line Effectiveness (OLE), Overall Factory Effectiveness (OFE), Overall Throughput Effectiveness (OTE) are some methods from literature which presents different metrics that measure whole systems' efficiency rates -and sometimes bottleneck operations-. This study focused on finishing section of weaving process. OTE calculation technique is adapted to the mentioned process. The aforementioned method assumes each machine's speeds are closed to each other. But in the real system, there are distinct speed difference between looms and the other finishing machines. So, in order to get more accurate OTE results, process importance coefficients of machines are calculated utilizing hybrid evolutionary algorithm. Real random numbers, which are used to constitute genes of chromosome, prevent infeasible solutions for the next generations in the proposed technique. Algorithm is strengthened with local search method to get better findings. Obtained results also compared with Multiple Linear Regression.

PS01.33

June 21, 2018 | 09:30 – 11:00

Application of Data Mining Techniques to Immigration Data

[Burcu Caglar Gencosman, Tulin Inkaya](#)

Industrial Engineering Department, Uludag University, Bursa, Turkey

Abstract: The identification of the immigrants' profiles is of great importance in the development of effective integration strategies and policies for the governments and social organizations. In this context, data mining is a promising approach for systematic and comprehensive analysis of immigrant data. Motivated by this, the aim of this study is to determine the profiles of the immigrants to Turkey using the data mining methods and to examine their effects on the labor market. The immigrants are clustered according to their education and employment properties, and the characteristics of the immigrants are identified for each cluster. The results provide a basis for the development of policies and strategies that ensure the direction of the immigrants to the appropriate business areas.

PS01.73

June 21, 2018 | 09:30 – 11:00

Analysis of Frequent Visitor Patterns in a Shopping Mall

[Onur Dogan¹](#), [Omer Faruk Gurcan¹](#), [Basar Oztaysi¹](#), [Ugur Gokdere²](#)

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²*Blesh Incorporated, ITU Ariteknokent Ari-2 Binasi B Blok, Istanbul, Turkey*

Abstract: Recent technological advances enabled companies to collect, store and process a large amount of data. Automated collection of human behavior is one of the recent developments in data collection field. Companies can analyze the behaviors of their customers and get insight into their needs by using automated collection technology. In this study, we analyze location-based services data collected from a major shop-ping mall in İstanbul. The data is composed of 293 locations and 12070 unique visitors. The results show the most frequent routes that users follow during different periods.

PS02.83

June 21, 2018 | 09:30 – 11:00

Big Data Concept in Small and Medium Enterprises: How Big Data Effects Productivity

[Ahmet Tezcan Tekin](#)¹, [Nedime Lerzan Ozkale](#)¹, [Basar Oztaysi](#)²

¹Management Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey

²Industrial Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey

Abstract: The topic of data mining is a popular subject, especially nowadays. Data mining is a process which accesses the information among largescale data and mine the knowledge. The most widespread use in the literature is to process large amounts of data automatically or semi-automatically to find meaningful patterns. Depending on the pace of the spread of Internet usage, digital media takes the place of traditional media, so the number of textual forms in digital media is increasing day by day. For this reason, text mining techniques should be used for text review. Such as text mining, data mining, machine learning technologies are related to big data concept, and these technologies are used for increasing productivity in too many areas. According to the analysis in the United Kingdom and the United States, companies adopting decision-making based on data have been observed to be 5 - 10% higher in output and productivity than firms using only information technology components such as soft-ware products. So, even if small and medium enterprises can adopt these technologies to their life cycle can gain more productivity and economic profit in their areas.

PS02.93

June 21, 2018 | 09:30 – 11:00

Usability Measurement of Mobile Applications with System Usability Scale (SUS)

[Aycan Kaya](#), [Reha Ozturk](#), [Cigdem Altin Gumussoy](#)

Industrial Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey

Abstract: The mobile application market is expanding with the diversity in mobile devices, and competition among the mobile application developers becomes fierce. Usability of the mobile applications is crucial to gain a competitive advantage under these circumstances. This study aims to reveal the difference in terms of usability of four of the commonly used mobile applications (WhatsApp, Facebook, YouTube, and Mail). Furthermore, this study investigates the difference in terms of usability between iOS and Android operating systems. To measure the usability of the mobile applications, a System Usability Scale (SUS) with an adjective rating scale is applied to the young 222 participants, using the applications on their mobile phones. The result of the study shows that usability of all applications is satisfactory and above the standards. The comparison of mobile applications with each other shows that, WhatsApp has the highest usability score, whereas Facebook has the lowest one. In addition, according to the results, there is no significant difference between operating systems in terms of usability of mobile applications.

PS02.97

June 21, 2018 | 09:30 – 11:00

Factors Affecting Intention to Use Big Data Tools: An Extended Technology Acceptance Model

[Serap Okcu](#)¹, [Gulsah Hancerliogullari Koksalmis](#)², [Ecem Basak](#)², [Fethi Calisir](#)²

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²Industrial Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey

Abstract: The purpose of this study is to examine the factors affecting the intention to use big data tools, using an extended technology acceptance model. The model includes job relevance, big data dimensions, compatibility, self-efficacy, complexity and anxiety. The study was conducted on a Turkish airline company, and data were gathered from its employees through an online survey. A total of 252 questionnaires were collected. The results show that behavioral intention to use big data technology is explained by perceived usefulness and perceived ease of use. Of these, perceived usefulness has a higher direct influence on behavioral intention to use big data tools. Another result of this study is that perceived usefulness is

explained by perceived ease of use, job relevance, compatibility and big data dimensions, where big data dimensions have a higher direct influence on perceived usefulness. The final result is that perceived ease of use is explained by self-efficacy and anxiety. Of these two factors, self-efficacy has a higher direct impact on the perceived ease of use.

PARALLEL SESSION 03 | PS03

PS03.49

June 21, 2018 – 09:30 – 11:00

Measuring the Impact of University Service Quality on Academic Motivation and University Engagement of Students

Fatma Kutlu Gundogdu¹, Umut Asan²

¹Industrial Engineering Department, Engineering Faculty, Istanbul Kültür University, Istanbul,

²Industrial Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey

Abstract: This study aims to analyze the impact of university service quality on academic motivation and school engagement as well as the impact of school engagement on academic motivation. In order to analyze the structural model, not only hypotheses about the causal relationships but also indicators operationalizing the concepts have been proposed. Data was collected by means of an online questionnaire, applied to students in private and state universities, and analyzed using structural equation modelling based on partial least squares. According to the findings, academic aspects and physical characteristics among the service quality dimensions are the most important ones explaining the variation in school engagement perception. The results also show that school engagement has a strong significant impact on academic motivation.

PS03.51

June 21, 2018 | 09:30 – 11:00

Blockchain Technology for Improvement of SCM and Logistics Services: A Survey

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¹Luxembourg Institute of Science and Technology, Esch-sur-Alzette

²University of Èvry Val d'Essonne, France

Abstract: Since the advent, the blockchain has found its application in numerous industries thus disrupting the current way of design and development of the new applications for the supply chain management and logistics. Nowadays for the business providers, the efficiency of the service they provide is crucial for long-term improvement. This efficiency is depended on service delivery for the consumers by satisfaction, those with information related to goods, the correct delivery and always on time. The business enterprises are strongly dependent on the application and models they use for planning and management of their daily activities. For the collaboration, the information sharing is crucial for a reliable and efficient way of work. These papers aim at surveying the current state on the academic literature and application from the business perspective, for the blockchain in supply chain management and logistics.

PS03.84

June 21, 2018 | 09:30 – 11:00

A Customer Satisfaction Study in an Airline Company Centered in Turkey

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²Economic, Administrative and Social Sciences Faculty, Nisantasi University, Istanbul, Turkey

Abstract: Airline industry has many challenges: decreasing costs, responding changeable demand, achieving high quality requirements as well trying to maintain superior services and satisfy customer needs. Turkish aviation industry presents a remarkable growth during the recent years. Besides strategic role of geographical position of Turkey, when new airport started to service in İstanbul, Turkey's importance in the world aviation sector will increase further. Customer satisfaction is crucial in increasing the profitability of airline companies as the aviation industry grows. Turkey centered airplane companies have flight more than 120 countries and 300 cities over the world. Previous studies have investigated customers' perception of service quality and the effect

of customer satisfaction levels on their future behavior, and various strategies for achieving customer satisfaction and customer loyalty. According to J.D. Power 2017 report, customer satisfaction with airlines has been rising for the past five years. So companies should understand customer satisfaction elements well to sustain their competitive advantage. This study looks at how online, cabin, flight services and personnel characteristics could affect customer satisfaction of an airplane company centered in Turkey. Data were collected from the more than 1400 passengers, domestic and mainly international flights. Relations in the model is tested with Structural Equation Modelling using IBM SPSS Amos package.

PARALLEL SESSION 04 | PS04

PS04.29

June 21, 2018 | 11:30 – 13:00

Multi-Criteria Selection Analysis of the City Buses at Municipal Transportation

Fuat Kosanoglu, [Alperen Bal](#)

Industrial Engineering Department, Engineering Faculty, University of Yalova, Yalova, Turkey

Abstract: Public transportation decisions are an important aspect of management of cities. Especially, for the small and mid-sized cities, bus transportation is more important due to lack of rail transportation. The goal of this paper is to present determination of public transportation vehicle from the municipal corporation managers' perspective by using analytic hierarchy process (AHP). In our analysis, we use 4 main criteria and 9 sub-criteria that are indicated by the experts for the selection of most suitable bus considering sustainability conditions. A survey is designed about vehicles with internal combustion engines and electric motors that enables each expert to compare the relative priority of each criteria with other criteria. A real-world application of a municipal corporation is conducted to illustrate the utilization of the model. The results presented in this study highlight the necessity to integrate analytic and comprehensive decision-making process into public transportation decisions.

PS04.80

June 21, 2018 | 11:30 – 13:00

A Literature Review for Hybrid Vehicle Routing Problem

[Busra Gulnihhan Dascioglu](#), [Gulfem Tuzkaya](#)

Industrial Engineering Department, Engineering Faculty, Marmara University, Istanbul, Turkey

Abstract: With the increase volume of environmental studies, hybrid vehicle routing and recharging stations location problem for electric vehicles have become more important. The aim of this paper is to review the literature on hybrid vehicle routing problem from 2000 to latest researches in order to identify the current research and to provide direction for future research in this field. Researches are classified considering the research publication year and research fields. Research gaps are identified for future research areas.

PS04.100

June 21, 2018 | 11:30 – 13:00

Simulation Modelling of an Information System for Casualty Transportation and RFID-Based Tracking in Large Scale Disasters

[Nadide Caglayan](#), [Sule Itir Satoglu](#)

Industrial Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey

Abstract: The number of people affected is very high especially in cases of large-scale disasters. Unfortunately, since these events cause panic and confusion, it is hard to track the disaster victims. In addition, since there is a high density in temporary medical centers and hospitals, services cannot be provided at the level required for injuries. Within the disaster management studies, the victim tracking studies are limited.

In this study, an information system that employs RFID technology has been proposed to allow tracking the victims through the rescue and casualty transportation process to the medical centers. Through the use of RFID technology in the process, it is aimed to facilitate the data flow and visibility of the victims. Besides, the data flow between the medical centers and the ambulances is also considered in the system, so that the availability

of the medical centers are checked and the casualty can be transported to the facilities that have enough capacity. In order to validate the utility of the proposed information system, a simulation model of the existing system with no information flow between the ambulances and medical centers and the proposed information system are compared to each other, in terms of patient flow time. The paired t-test results shown that the difference between the average patient flow times of the proposed information system and the existing system with no information flow is statistically significant.

In addition, increased visibility and traceability of the victims; collection of emergency data including number of casualties at a datacenter that enhances coordination of the emergency activities are other expected benefits of the proposed information system. Hence, magnitude of the emergency can be better figured out for further planning of the recovery phase.

PARALLEL SESSION 05 | PS05

PS05.12

June 21, 2018 | 11:30 – 13:00

Comparison of Isotropic and Anisotropic Models for Solar Radiation on Sloped Surfaces Under Fuzzy Logic

[Veysel Coban](#), [Sezi Cevik Onar](#)

Industrial Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey

Abstract: Energy is a vital necessity that ensures the continuity of life. It is also important to ensure the existence and continuity of the energy. Solar is the most important source of energy among renewable energy sources that are being developed as an alternative to fossil fuels that are consuming. This study develops models for the evaluation of solar energy systems and allow calculation of radiation values in the sloped surface for isotropic and anisotropic sky conditions. In literature, the effects of extraterrestrial, atmospheric, and terrestrial uncertainties are usually ignored. In the proposed fuzzy models, these uncertainties inherit in the solar energy production capacity are considered. These newly developed isotropic and anisotropic fuzzy models help to determine the most appropriate solar energy system by providing more realistic calculations.

PS05.92

June 21, 2018 | 11:30 – 13:00

Short Term Electricity Load Forecasting with Nonlinear Autoregressive Neural Network with Exogenous Variables (NarxNet)

[Ibrahim Yazici](#)¹, [Leyla Temizer](#)², [Omer Faruk Beyca](#)¹

¹*Industrial Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey*

²*Industrial Engineering Department, Engineering Faculty, Istanbul University, Istanbul, Turkey*

Abstract: Electricity load forecasting and planning have vital importance for suppliers as well as other stakeholders in the industry. Forecasting and planning are relevant issues that they provide feedback each other to increase efficiency of management. Accurate predictions lead into more efficient planning. Many methods are used for electricity load forecasting depending on characteristics of the system such as stationariness, non-linearity and heteroscedasticity of data. On the other hand, in electricity load forecasting, forecasting horizons are important issues for modeling time series. In general, forecasting horizons are classified into 3 categories; long-term, mid-term and short-term load forecasting. In this paper, we dealt with short-term electricity load forecasting for Istanbul, Turkey. We utilized one of the efficient nonlinear dynamic system identification tool to make one-step ahead prediction of hourly electricity loads in Istanbul. In final, obtained results were discussed.

PS05.86

June 21, 2018 | 11:30 – 13:00

Implementation of Capital Budgeting in Hydraulics Industry

[Selen Avci](#), [Cansu Aydin](#), [Atakan Alkan](#), [Zerrin Aladag](#)

Industrial Engineering Department, Engineering Faculty, Kocaeli University, Kocaeli, Turkey

Abstract: Companies make capital investment in order to create profit opportunities and increase value for shareholders. Moreover, it is a necessity to sustain volume of production, efficiency and sales in the following year. Therefore, companies need to take

action for their future and vitality. The first step of this study is capital budgeting. Capital budgeting is a method to examine whether investment opportunities are feasible for companies. In this sense, there are many methods to calculate feasibility and two group of them are to be considered; under the assumption of certainty and under the assumption of uncertainty. In this study, strategic management process is examined for a hydraulic didactic set company through new investment project's capital budgeting. "Net realizable value (NRV)", "internal rate of return (IRR)" and "payback period" used as an under the assumption of certainty method. Furthermore, under the assumption of uncertainty methods were compared with previous analyses. In the end, the decision to proceed with this investment project is evaluated through taking into account analysis, risk rates and strategic management.

PARALLEL SESSION 06 | PS06

PS06.53

June 21, 2018 | 11:30 – 13:00

Determination of the Specialty Department in Medicine by Using Fuzzy TOPSIS Method

Selen Avci, Sevil Gunel, Atakan Alkan, Zerrin Aladag

Industrial Engineering Department, Engineering Faculty, Kocaeli University, Kocaeli, Turkey

Abstract: Decision-making is a process that takes time and affects our life in terms of criticality of results. This process is quite tough when it is difficult to express numerically and when comparisons cannot be made proportionately. In such cases, the Fuzzy Logic approach can be used to facilitate the decision making process. The Fuzzy TOPSIS method is one of the multi criteria decision making methods that simplify decision making among alternatives that have similar qualities and that are difficult to choose for this reason. The purpose of this study is, using the fuzzy TOPSIS method, to determine the preferences of the decision makers who have recently graduated from the medical faculty and who have started to work as general practitioners in the speciality departments of medicine. In the study, 15 alternatives have evaluated via 9 criteria and preferences of speciality department have determined through 21 decision makers. In the selection of alternative departments, 15 alternatives with the

longest duration of internship are considered. The criteria have been determined in accordance with the studies in the literature and the opinions of specialist doctors. As a result, 15 alternative speciality departments in medicine have ranked.

PS06.67

June 21, 2018 | 11:30 – 13:00

Evaluating Service Quality of an Airline Maintenance Company by Applying Fuzzy-AHP

Yavuz Selim Ozdemir, Tugce Oktay

Industrial Engineering Department, Faculty of Engineering and Architecture, Istanbul Arel University, Istanbul, Turkey

Abstract: Quality greatly affects both customer satisfaction and the performance of a product or service. Therefore, due to competitive market conditions, the importance of quality measurement has increased. In reality, measuring quality is not an easy task, especially in the service sector, due to the heterogeneous, inseparable and incomprehensible characteristics of service products. Most service sector products are intangible. In the field of aviation, the quality of care directly affects aviation safety. This increases the importance of measuring and improving service quality in aviation. In this study, fuzzy analytical hierarchy process approach was used for measurements. In the hierarchical structure, 3 main criteria, 6 first level sub-criteria and 17 second level sub-criteria were used for quality measurement in airline maintenance service. The surveys were answered by experts working for maintenance companies. The final maintenance quality results were converted to a letter scale and used for service quality improvement.

PS06.71

June 21, 2018 | 11:30 – 13:00

A Fuzzy Based Risk Evaluation Model for Industry 4.0 Transition Process

[Murat Colak¹](#), [Ihsan Kaya²](#), [Melike Erdogan²](#)

¹Industrial Engineering Department, Engineering Faculty, Kocaeli University, Izmit/Kocaeli, Turkey

²Industrial Engineering Department, Engineering Faculty, Yildiz University, Istanbul, Turkey

Abstract: The concept of industry 4.0 is a critical topic that has been addressed by many studies recently as well as the business community. However, there are not many studies on the risk assessment of industry 4.0 transition process. In this paper, it is tried to identify the risks that companies may face in the industry 4.0 transition process and to suggest a methodology for prioritization of these risks. We applied to expert opinions to address all numerical and verbal factors and used a fuzzy multicriteria decision-making (MCDM) methodology in order to determine the most and the least critical risks. For this aim, hesitant fuzzy sets (HFSs) and interval type-2 fuzzy sets (IT2FSs) have been utilized together to obtain the best results that are closer to the reality. Finally, risks have been prioritized for companies in transition process to Industry 4.0.

PARALLEL SESSION 07 | PS07

PS07.16

June 21, 2018 | 14:30 – 16:00

A Mathematical Programming Model for Maritime Inventory Routing Problem

[Elifcan Gocmen](#), [Ebru Yilmaz](#), [Rizvan Erol](#)

Department of Industrial Engineering, Faculty of Engineering, Cukurova University, 01330, Balcali, Saricam, Adana, Turkey

Abstract: Inventory routing problems (IRPs) have been one of the most important problems in the last thirty years and include inventory management, vehicle routes and distribution sub problems. Several IRPs have been implemented in various sectors. Maritime inventory routing problem (MIRP) has also been tackled widely. The problem includes the distribution of products and holding the inventory levels between upper and lower limits. In this study, MIRP for the

distribution of containers considering available inventory levels aiming minimum total cost has been proposed. Distribution amount and the routes under the constraints of routing and inventory levels have been decided. The model is proposed for deciding both optimal routes of the ships and optimum inventory levels. An integer programming approach for the problem has been proposed and solved using GAMS software.

PS07.34

June 21, 2018 | 14:30 – 16:00

A New Genetic Algorithm Improved with Heuristic Methods and Reinforcement Learning to Solve the Symmetric Traveling Salesman Problem

[Gulnihal Ucarkus](#), [Burcu Caglar Gencosman](#)

Industrial Engineering Department, Uludag University, Bursa, Turkey

Abstract: Traveling salesman problem (TSP) is one of the most studied well-known combinatorial optimization problem. In this study, the symmetric TSP is addressed, and a Genetic Algorithm (GA) is proposed to solve the problem. The initial population of the GA is improved by search algorithms, and the Reinforcement Learning mutation (RLM) is used in the mutation phase. Reinforcement learning is a global optimal search method in which an agent learns behavior through trial and error and is based on finding an immediate reward from the environment. In TSP, the reward is distance between two cities and the shorter the distance means the bigger the reward. Thus, the RL algorithm tries to optimize the tour based on the total reward between two cities. The analyses of the proposed algorithm are performed with TSPLIB problems, which are commonly used by researchers. The results are compared by other heuristics methods that are developed for the same problem in the literature.

PS07.74

June 21, 2018 | 14:30 – 16:00

Estimating the Expected Cost of Function Evaluation Strategies

Rebi Daldal¹, Zahed Shahmoradi², [Tonguc Unluyurt](#)³

¹University of California, Berkeley, USA

²University of Houston, USA

³Faculty of Engineering and Natural Sciences, Sabanci University, Istanbul, Turkey

Abstract: We propose a sampling-based method to estimate the expected cost of a given strategy that evaluates a given Boolean function. In general, computing the exact expected cost of a strategy that evaluates a Boolean function obtained by some algorithm may take exponential time. Consequently, it may not be possible to assess the quality of the solutions obtained by different algorithms in an efficient manner. We demonstrate the effectiveness of the estimation method on random instances for algorithms developed for certain functions where the expected cost can be computed in polynomial time. We show that the absolute percentage errors are very small even for samples of moderate size. We propose that in order to compare strategies obtained by different algorithms, it is practically sufficient to compare the estimates when the exact computation of the expected cost is not possible.

PARALLEL SESSION 08 | PS08

PS08.31

June 21, 2018 | 14:30 – 16:00

A Mathematical Model and a Matheuristic for In-Plant Milk-Run Systems Design and Application in White Goods Industry

Kadir Buyukozkan¹, Alperen Bal², Mehmet Kursat Oksuz³, Emine Nisa Kapukaya⁴, Sule Itir Satoglu⁴

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³Industrial Engineering Department, Faculty of Engineering, Erzincan University, Erzincan, Turkey

⁴Industrial Engineering Department, Management Faculty, Istanbul Technical University, Istanbul, Turkey

Abstract: Effective material distribution is a vital issue to maintain the assembly lines' operations. So, coordination of the material supply to the assembly lines requires a system design that minimizes total material handling, inventory holding costs and prevents parts shortage. This is called the multi-commodity multi-vehicle material supply system design problem. To solve this, first, a *Single-Vehicle Milk-run Mathematical Model* is proposed. Then, a *Matheuristic* that iteratively employs the proposed model is developed to design a multi-vehicle in-plant milk-run system. The proposed methodology is validated by designing the milk-run system of a real washing machine assembly plant.

PS08.47

June 21, 2018 | 14:30 – 16:00

Inventory Control through ABC/XYZ Analysis

[Esra Agca Aktunc](#), [Meltem Basaran](#), [Gozde Ari](#), [Mumin Irican](#), [Sahna Gungor](#)

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Abstract: In this study, inventory and production control of a group of products from a major manufacturer of domestic and industrial gas meters is examined. ABC and XYZ analyses are carried out for the inventory items to determine the production strategy of each item class and the Economic Order Quantity (EOQ). After this examination, one of the end products of the company is chosen to develop the Materials Requirement Plan (MRP) for. The Bill of Materials (BOM) for the chosen product is created and MRP is developed according to the BOM levels. The monthly demand data for the final product is obtained based on the annual demand and the required quantities for all sub materials of the final product are calculated with MRP. Finally, after the ABC/XYZ analysis, BOM structuring, and MRP calculations, a user interface is developed in Excel using Visual Basic for Applications (VBA) to access, edit, and add the desired information easily.

PS08.61

June 21, 2018 | 14:30 – 16:00

Lean Part Flow in Magnet Production Lines

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Abstract: This study is about lean parts flow in manufacturing at Bosch Industry and Trade. Inc. in Bursa Plant. Analysis of system and detection of main reasons of problems were done in Magnet production process. The main problem to be solved in the project is that the flow of parts in the magnet production line is not lean.

This study covers non-lean part flow due to non-application of FIFO cycle rules, confirmation problems and stock management problems in magnet line, plastic injection and washing area. The root causes of these problems have been identified within the scope of the simplification studies made on the magnet lines. The number of parts that need to be stock is indefinite and accordingly the stock process not be managed well. To analyze the problem in more detail, system analysis was applied for the current situation related to the stock area examined. Solutions for these root causes have been developed. The results were evaluated by applying developed suggestions of solution.

The main purpose of the project was to determine deviations in stock, efficiency, time and cost calculations that disturbed the lean flow in the magnet production lines flow and was experienced throughout the process. These deviations were determined by the necessary engineering approaches and prevention plans and development of application methods. In this context, capacity analysis, clustering analysis, the inventory method, the Kanban card formulation according to BPS (Bosch Production System) method obtained after the literature search related to stock area management processes and stock amount calculations were used. As a result of the work done, 58% stock improvement was calculated. The risk of inventory difference has been eliminated so that flow of parts and information are correct and synchronized.

PARALLEL SESSION 09 | PS09

PS09.41

June 21, 2018 | 14:30 – 16:00

An Optimization Model for Variable Ordering in Qualitative Constraint Propagation

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Abstract: In this study, a nonlinear optimization model is proposed to determine the constraint propagation (CP) of qualitative constraint sets to minimize search backtracking points. The model gives answers to the questions of what the optimal sequence is in the case that there is a set of variables with known values and, alternatively, what variable sequence is optimal to be able to have an optimal value propagation. In order to improve the solution performance, a constraint activation analysis is initiated for the constraints that are defined for the variables with known values by sign algebraic Karush-Kuhn-Tucker conditions. The optimization model and the qualitative activity analysis carried out can be applied to any constraint diffusion problem where the variables are truncated and have a limited set of values.

PS09.76

June 21, 2018 | 14:30 – 16:00

The Effect of the Initial Solution Algorithms Used in VNS for Solving Buffer Allocation Problem

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Abstract: This paper focuses on the effect of the initial solution generation algorithms used in variable neighborhood search (VNS) for solving buffer allocation problem (BAP). BAP is a design problem that aims to determine the optimal buffer configurations for a production system to achieve a predefined goal. In this study, BAP is solved for unreliable serial production lines so as to maximize the production rate of the line.

Since the problem is in the class of nonlinear stochastic knapsack problems a VNS-based heuristic search algorithm is employed to solve this problem. As in all heuristic search methods, starting with the good initial solution decreases the number of iterations required for the algorithms to converge. In this study, to be able to reach the optimum solution quickly the performances of two different initial solution generation algorithms are tested. These algorithms are the well-known bowl phenomenon developed by Hillier and Boling, and the method proposed by Papadopoulos and Vidalis. The main idea of bowl phenomenon is to distribute more buffers in the middle of the line and less buffers in the ends of the line so as to maximize the production rate of the line. The second method also proposes to distribute more buffers in the middle of the line but it also considers the bottleneck machines while distributing the buffers. The performances of these two algorithms are tested on benchmark problems taken from literature. The results show that starting to search with a good initial solution significantly decreases the number of iterations required to reach the optimum solution.

PS09.89

June 21, 2018 | 14:30 – 16:00

Quay Crane Scheduling Using Metaheuristics in Container Terminals

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Abstract: The international trade by containers shows a dramatic growth during the recent years. Therefore, optimization and efficiency is an essential need for the container terminals which are the gates of the countries opening to the world. Terminal efficiency can be provided by the effective usage of the cranes at berths and storage area, and of transporters between these areas. In this paper, we focus on the quay crane operations in a non-automated container terminal. For this purpose, two novel methodologies, which comprise the employment of the ant colony

optimization (ACO) metaheuristic and of genetic algorithm (GA) using greedy randomized adaptive search procedure (GRASP), is proposed to sequence and schedule the quay crane operations. In order to test the proposed methodology, various scenario analyses in different sizes are taken from the literature. The process completion time is used as the performance measure. It has been observed that GA is superior to ACO, and consequently GA can be applied in container terminals.

PARALLEL SESSION 10 | PS10

PS10.87

June 21, 2018 | 16:30 – 18:00

A Markov Decision Process Approach to Estimate the Risk of Obesity Related Cancers

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Abstract: Around 13% of the world's adult population were obese in 2016 and the prevalence of obesity increased in a significant rate in the last decade. One of the health consequences of obesity is increased cancer risk. In this study, we model obesity levels based on BMI, cancer and death using a Markov decision process model in order to observe the effect of obesity in cancer and mortality risks. Objective of the model is total discounted quality adjusted life years and we simulate an individual's lifetime from 20 years to 70 years by sex. Actions available to the decision makers are no intervention and bariatric surgery. Bariatric surgery is one of the effective clinical prevention methods of obesity and it is particularly recommended for morbidly obese patients. However, it is also associated with increased mortality risk. Our model aims to observe this complex dynamic between obesity, cancer and mortality risks and bariatric surgery. We parametrize the model using randomized clinical trials and published literature and obtain the optimal policy by sex. Our results suggest that obese patients for all obesity levels should undergo bariatric surgery to improve their health outcomes and to decrease cancer risk. This study has the potential to provide guidance to the obese individuals when considering bariatric surgery and it could be further

enhanced by addition of other health outcomes of obesity to the model.

PS10.98

June 21, 2018 | 16:30 – 18:00

Evaluation of Scheduling Models for the Performance of a Medical Clinic

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Abstract: Healthcare cost in the United States is one of the highest in the world. High patient waits times, physician idle times, physician overtimes and patient congestion are some common problems encountered in medical clinics. The patient and provider times mainly depend on the type of appointment system. This research studies the effect of different appointment systems on the operational performance of a university medical clinic. The process at the Student Health Center (SHC) in Louisiana State University was modeled using the Rockwell Arena® simulation software. Four scheduling rules: Individual Block rule, Bailey rule, 3-Bailey rule, and the Two-at-a-time rule, were studied using the simulation model to test their effect on the performance parameters. The performance parameters were the provider measures and patient measures. The individual block rule was found to be the most patient friendly with shortest patient measures. The 3-Bailey rule was the most provider friendly rule with the least provider times. A Kepner-Tregoe analysis shows that the Bailey rule was the most suitable rule as it had a good trade-off between the patient times and provider times compared to the other rules. The Bailey rule had better provider times (Idle time – 31.8 min, Startup idle time – 6.5 min, Overtime – 6.9 min) and better provider utilization rate (92%) than the individual block rule but had marginally higher patient times (throughput time – 41.4 min and wait time – 17.3 min). A test run with one provider for ten days confirmed the behavior of the Bailey rule.

PS10.103

June 21, 2018 | 16:30 – 18:00

A Combined Method for Deriving Decision Makers' Weights in Group Decision Making Environment: An Application in Medical Decision Making

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Abstract: The complexity of problem grows as multiple individuals involve in the decision-making process. Since each individual may have different experience, attitudes, and knowledge, their approaches might be different from each other on a same problem. Therefore, more comprehensive techniques are needed in group decision making methods in order to determine how much a decision maker's contribution is considered in the final solution (i.e., weight of each decision maker). The purpose of this study is to determine the combined weights of decision makers based on both the objective weights, using the geometric cardinal consensus index, and the subjective weights provided by a supervisor. In order to represent the implementation of the method, the study includes a case study in a medical decision making. The combined relative weights of the medical doctors are derived in a problem where an appropriate anesthesia method to apply in the surgeries is selected by evaluating several alternatives such as general anesthesia, local anesthesia and sedation.

PARALLEL SESSION 11 | PS11

PS11.38

June 21, 2018 | 16:30 – 18:00

Risk Assessment with Fuzzy FMEA in Design and Production Processes of Power Transformers

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Abstract: In today's conditions, companies need to lower their costs so that they can maintain their market

place. Errors in the processes; which do not provide added value for companies, are targeted to be removed. Risk has become very important for companies, for the effect they have on customer satisfaction and costs. Companies; they have to increase their reliability in the process to maintain their competitiveness and ensure their continuity in the market place.

Risk analysis refers to the identification of the hazards the factors that cause risks, the analysis and grading of the risks arising from the hazards and the necessary work to be done in order to determine the control measures. In this study, one of the most effective risk assessment methods, Failure Mode and Effects Analysis (FMEA) was used. FMEA predominantly study system, service, design and production processing. In this method, the detection before the occurrence of the risks, the determination of the importance levels, the evaluation and the appropriate measures are taken. The importance rates of the risks are determined according to the Risk Priority Number (RPN). While calculating the RPN value in the classic FMEA, it is observed that the significance levels arising from the equal acceptance of the risk factor weights may vary. In order to solve these problems arising from the approach of classical FMEA logic, fuzzy FMEA are started to be used.

Fuzzy logic is an approach that provides consistent and accurate decisions based on precise unknown information. This approach gives machines the ability to handle people's special data and to benefit from their experience and precepts. Fuzzy logic operations consist of the analysis and identification of the problem, the formation of clusters and logical relations, the representation of existing information as fuzzy sets and the interpretation of the model.

In this study; FMEA and fuzzy logic structures which are used in the application process have been investigated in detail. The risks of design and production processes of power transformers produced by Balıkesir Elektromekanik Sanayi Tesisleri A.Ş. (BEST A.Ş.) have been analyzed. To prioritize identified risks, Fuzzy FMEA was used. As a result, the risks involved in the design and production processes have been reduced to a minimum.

PS11.44

June 21, 2018 | 16:30 – 18:00

Analyzing of Pipe Production Fault Rates by Association Rules and Classification According to Working Conditions and Employee Characteristics

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Abstract: In order to survive in a competitive environment, companies are required to increase the productivity by identifying the factors that affect the failure rates. In this study, fault rates of a pipe manufacturing company is investigated. Therefore, based on data attributes such as demographic characteristics of employees, employee trainings, physical working conditions, social facilities etc. were gathered. Briefly, data were analyzed by association rules, correlation and various classification algorithms. The association rules, measurements and correlations of attributes are examined to understand the current situation. Then, based on this information, various classification algorithms have been used to for estimation. The higher accuracy of the prediction, the greater results will occur. Therefore, the accuracy of the classification algorithms is compared and the algorithm with highest performance is achieved.

PS11.46

June 21, 2018 | 16:30 – 18:00

Root Cause Detection with an Ensemble Machine Learning Approach in Multivariate Manufacturing Process

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Abstract: Quality control in multivariate manufacturing processes should be applied with multi variate control charts. Although this method is sufficient, it doesn't include the causes of uncontrolled situations. It only shows samples that are out of control. A variety of methods are required to determine the root cause(s) of the uncontrolled situations. In this study, a

classification model, based on ensemble approach of machine learning classification algorithms, is proposed for determine the root cause(s). Algorithms are compared according to predictive accuracy; kappa value and root square mean error rates as performance criteria. Results show that Neural Network ensemble techniques are more efficient and successful than individual Neural Network learning algorithms.

PARALLEL SESSION 12 | PS12

PS12.01

June 22, 2018 | 11:00 – 12:30

Mobile Health (mHealth) Applications and Self HealthCare Management: Willingness of Female Patients Living in Rural Areas to Static Mobile Apps

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Abstract: The objective of this research is to assess attitudes and preferences of female patients living in rural areas regarding various functionalities a mobile app can play. I classified mobile app functionalities into two major categories of static and dynamic. Static functionalities are those with whom a patient develops one-way, top-down interactions, such as receiving drug information from hospital staffs. Interactive functionalities develop mutual and engaging interactions among patients, physicians and health staffs. This is a descriptive, cross-sectional study collected data from 460 female patients visited rural “Health Houses” in provinces of Ardabil and Isfahan. The respondents were selected randomly. The data collection tool is a questionnaire designed by the author. Validity (content and form) and reliability (Spearman- Brown with $r=0.83$) includes two categories of questions: background and questions regarding the role of mobile information-communication apps. Data were analyzed by SPSS software. This research shows that the patients prefer a mobile health app that develops a static interaction between themselves and their physician or other health staffs. In general, patients have medium trust to mobile apps, and they prefer to use mobile apps developed and run by a clinic or a hospital so that they can receive health information, medical bills and the results of their

medical tests. They showed little tendency to interact with other patients, physicians and health staffs through a mobile app. They prefer face to face interactions.

PS12.08

June 22, 2018 | 11:00 – 12:30

Humanitarian Supply Chain Management: Extended Literature Review

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Abstract: Humanitarian supply chain management (HSCM) has gained popularity in recent years in research fields. The aim of this paper is to review the literature on humanitarian operations and crisis/disaster management from 2010 to the latest researches, in order to identify the current research and to provide direction for future research in this growing field. Studies are classified considering the research publication year and research fields. Articles from humanitarian supply chain management were reviewed, and keywords were identified within a disaster management lifecycle framework. Research gaps are identified for future research areas.

PS12.79

June 22, 2018 | 11:00 – 12:30

Predicting Organ Donation Outcome using Network-Based Machine Learning Algorithms

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Abstract: Thousands of people die every year waiting for organs. Therefore, it is now more important than ever before to study the factors associated with organ donation, which will potentially help in making data-driven strategies to increase the consent for deceased organ donation. This paper uses machine learning algorithms to accurately predict organ donation outcome (consent: yes/no from family). In this study, 6 years patients' data from an OPO located in New York city has been used to build the consent prediction

transportation of the fabric ball. As the result of these analyses, F_{comp} and F_{shear} values on L4-L5 joint were compared with AL (Action Limit) and MPL (Maximum Pressible Limit) values were determined by NIOSH and UW. Various analyses were performed for different job tasks and the results were explained in detail.

PS13.77

June 22, 2018 | 11:00 – 12:30

The Effects of the Dimensions of Organizational Justice over The Perception of General Justice

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Abstract: The purpose of this study is to investigate the effect of the dimensions of organizational justice over the perception of general justice, specifically concerning the architects and the civil engineers working in the construction sector. The study firstly defines organizational justice and the dimensions of this concept. Afterwards, the study model used that is used in the research is constructed. The data was received from a data collection form that was prepared based on similar studies in the literature. A total of 313 subjects participated in the study: 157 civil engineers and 156 architects. The analysis has shown that the dimensions of organizational justice (distributive justice, procedural justice and interactional justice) have a positive effect on the perception of general justice. The results of the study provide important data for the construction firms who aim to create a sense of organizational justice among their employees.

PS13.101

June 22, 2018 | 11:00 – 12:30

Identifying Talent Attributes for Talent Management in Automotive Industry in Turkey

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Abstract: Talent management has become increasingly popular area in the human resource management. Over the past decade, talent management has gained importance and become an effective tool for organizations that want to have competitive advantage and achieve maximum organizational performance. For a successful talent management process, organizations need to identify talent attributes or in other words characteristics that a talented employee should have. The main purpose of this study is to define talent attributes in automotive industry in Turkey through a qualitative research. Within the scope of study, in-depth interviews were carried out with the participation of 20 employees who works in different companies that operates in automotive industry in Turkey. 29 talent attributes were identified as a result of face-to-face in-depth interviews.

PARALLEL SESSION 14 | PS14

PS14.27

June 22, 2018 | 14:00 – 15:30

Green Hospital Together with a Lean Healthcare System

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Abstract: Green hospitals and Lean Healthcare Systems are both dealing with increasing efficiency and effectiveness by decreasing waste/non-value added activities and cost in healthcare institutions. When both of the issues are used and applied, it can be seen that green hospitals will encourage more effective and efficient usage of energy, water and material currently used, ensure the prevention of any kind of waste, perform environmentally sensible and eco-friendly building design and be environmentally friendly in the process of service provision. In addition, lean healthcare will decrease waste, costs, non-value added activities, increase patient, doctor, nurse and staff satisfaction, decrease waiting times, increase performance and finally increase revenues. The aim of this study is to give information about the concept of green hospital with a lean healthcare system when applied jointly. It demonstrates the applicability of the concept of green hospitals in the healthcare sector together with lean management. The study examines

the contribution of these two concepts to healthcare institutions as well as to the environment. For this purpose, in this study, the concept of green, green healthcare, lean management and lean healthcare is defined and the joint application of green and lean healthcare is presented as a suggestion. The implementation of environmentally friendly green strategies, together with lean strategies to healthcare within the framework of social responsibility and in this respect extended employees, patient and community awareness can be suggested to both public, university and private hospital managers for developing and improving the sustainable lean healthcare systems.

PS14.81

June 22, 2018 | 14:00 – 15:30

The Relationship between Risk Management and Patient Safety Incidents in Acute Hospitals in NHS England

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Abstract: In healthcare, a number of applications have been applied from high-risk industries to minimise the risk of harm. However, there is little formal evidence to demonstrate the relationships between those applications and their contributions to patient safety. In this study, a correlation analysis was conducted to explore the link between risk management and patient safety incidents in hospitals in NHS England. Findings revealed that hospitals with the highest risk management level report more incidents and demonstrate a statistically significant relationship between risk management and patient safety incidents data. In contrast, hospitals with lower risk management levels do not demonstrate any statistically significant relationships. This study concludes that reporting a higher number of incidents is likely to be as a result of having a better risk management in hospitals, which indicates that a higher number of incidents reported refers to having a better incident reporting culture.

PS14.82

June 22, 2018 | 14:00 – 15:30

The Problem with Traditional Accident Models to Investigate Patient Safety Incidents in Healthcare

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Abstract: In healthcare, a number of patients experience incidents, where accident models have been used to understand such incidents. However, it has been often traditional accident models used to understand how incidents might occur and how future incidents can be prevented. While other industries also use traditional accident models and built incident investigation techniques based on the traditional models, such models and techniques have been criticised to be insufficient to understand and investigate incidents in complex systems. This paper provides insight into the understanding of patient safety incidents by highlighting the problems with traditional accident models to investigate patient safety incidents and gives a number of recommendations. We hope that this paper would trigger further discussions on the fundamental concept of the incident investigations in healthcare.

PARALLEL SESSION 15 | PS15

PS15.04

June 22, 2018 | 14:00 – 15:30

An Expert System Methodology for Planning IT Projects with Hesitant Fuzzy Effort: An Application

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Abstract: Delivering the projects on time and in accordance with the customer requirements is a crucial process for almost all software companies due to the budget and schedule constraints. Effective time planning provides optimum usage of all resources (i.e., people, time, budget, etc.). This study presents a new integrated decision support methodology for planning

software projects. For this purpose, we identify the most important factors by expert judgments and literature review, find priorities of factors by Hesitant Fuzzy Linguistic Term Pairwise Comparison, and estimate time effort (duration) for the projects, respectively. Subsequently, we develop a hybrid metaheuristic by using the priorities of factors and estimated time efforts of the projects. As an experimental study, we apply this methodology to determine time planning of software projects in a Turkish company. We analyze that the proposed methodology gives very efficient plans with less delayed projects and higher award in comparison with the initial solutions.

PS15.68

June 22, 2018 | 14:00 – 15:30

New Supervised Classification Approach as Networked Pattern Recognition Framework

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Abstract: This aim of this study is to propose a new classification framework as Networked Pattern Recognition (NEPAR) for different classification problems. In most research studies, classification focuses on either individual observation, which do not consider the dynamic interactions, which ignores the functional roles of observations. When they capturing interactions, they just give a general idea about networks. In this study, we propose a unified approach that combines pattern classification techniques and dynamic interactions for better classification approach. Therefore, the NEPAR and five different classification methods (SVM, NB, LR, DT, and kNN) are developed by adding information from the proposed networks (as seen in Figure 2-3).

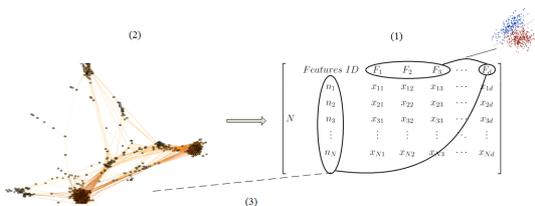


Figure 1. Combining network metrics and pattern recognition.

As seen in Figure 1, information from observations is extracted by building the network, and feature properties for each observation are used to classify the output. For the results, we compare three approaches: (1) classic approach that uses traditional pattern recognition techniques; (2) the networked approach that uses pattern recognition techniques on the network topology; and (3) the unified approach that combines network topology and real data with pattern recognition methods (see Figure 1).

More specifically, a new weighted heterogeneous similarity function is also proposed to estimate relationships among interactive events. In the second phase of the framework, combining pattern-recognition techniques with network-based approaches. In this research, we propose a new hybrid detection framework in the proposed network topology.

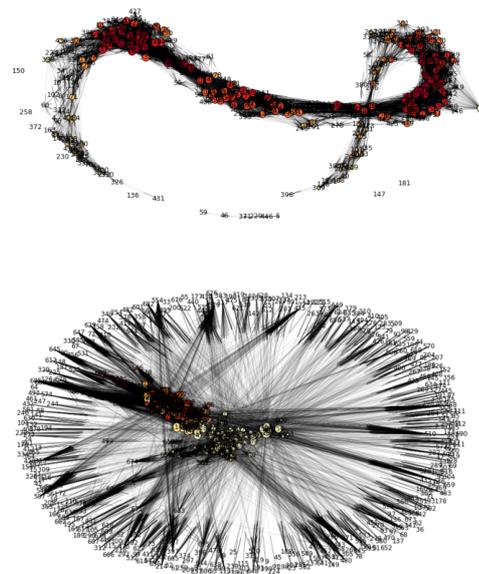


Figure 2. Networks for the Pima Indian diabetes dataset and Australian credit card approval dataset.

As a result, the networks (as seen in Figure 2 and Figure 3) are built to see how the events are similar and how they interact with each other. Based on the network metrics such as degree centrality, closeness centrality, betweenness centrality, in-degree centrality, out-degree centrality, load centrality and harmonic centrality, the pattern recognition techniques are applied to detect the credit card approval, breast cancer diagnosing, schizophrenia disease in fMRI, and diabetic disease. In conclusion, the proposed approach

was tested and validated using real-world case studies. Five different datasets (Australian credit approval, diabetes, breast cancer, StarPlus fMRI, German credit) are used to show the framework outperforms other traditional classification.

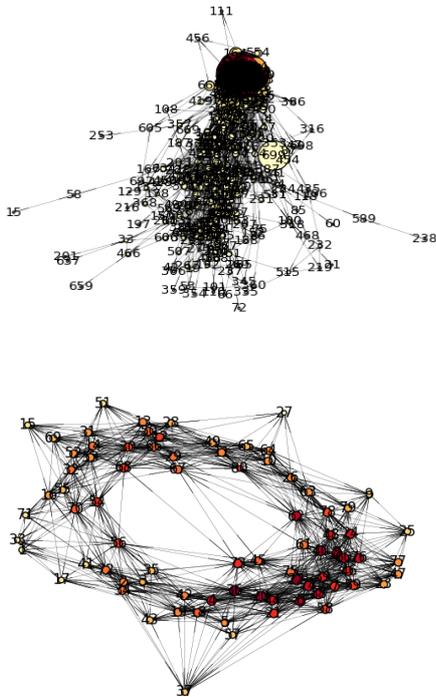


Figure 3. Networks for the breast cancer dataset and the StarPlus fMRI dataset.

PS15.105

June 22, 2018 | 14:00 – 15:30

The Importance of Risk Management on IT Investment Projects

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Abstract: Risk management is an important component of project management. There are diverse standards associated with risk management including Project Management Institute’s (PMI) Project Management Body of Knowledge (PMBOK), Australia-New Zealand ANZ- 4360, International Standards Organization (ISO) ISO 31000 Risk Management – Guidelines on Principles and Implementation of Risk Management, ISO/IEC 16085 Systems and software engineering – Life cycle processes – Risk Management, National Institute of

Standards and Technology (NIST) 800-30 Risk Management Guide for Information Technology Systems, Factor Analysis of Information Risk (FAIR), Institute of Electrical and Electronics Engineers (IEEE) 1540, and many others. PMBOK, ANZ-4360, and ISO/IEC 16085 focus primarily on project risk management whereas NIST 800-30, ISO 31000, and FAIR have a much broader scope and focus primarily on organizational or Enterprise risk management. Actually, all standards have five main components in common; risk management planning, risk identification, risk analysis, risk treatment, and risk monitoring

Technological changes and social needs are affecting the usage and acceptance of users and investment on a technology can be rapidly become obsolete. That’s why the investment of money to any Information Technology (IT) project is becoming a significant problem due to rapid economic, technological and social development. When investing in technological systems, it is absolutely necessary to closely monitor the alternatives of the systems and possible developments. The managers of companies spend the majority of their time making investment decisions. The process of making an investment decision is directly related to the assessment of many theoretical and practical problems of organization and management of economic activities. The investor, making investment decisions, is faced with business risk, the problems of complex Project evaluation, the selection of the best alternative, etc. In this study, it was tried to draw attention to the importance of risk management especially in IT projects. It has been mentioned that the preliminary assessment of IT investments that are about to begin requires new approaches of risk management so that investments are not wasted. Not only the technology itself it is important to understand the user experiences and user interfaces besides the technology necessities of any company itself.

PARALLEL SESSION 16 | PS16

PS16.17

June 22, 2018 | 16:00 – 18:00

Hinterland Container Transportation Using Mathematical Programming Approach

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Abstract: Container transportation problems include logistics activities conducted in both terminals and hinterland of the terminal. Transferring containers considering cost, time and environmental issues is a difficult problem. Hinterland container transportation (HCT) is defined as the movement of the containers between terminals and customers by different transportation modes. Processes of the hinterland transportation are the most important cost factors for door-to-door services. These problems aim to decide the distribution of the containers considering the cost and time minimization. In this study, a container distribution, routing problem has been proposed in the hinterland. The problem aims to perform the distribution of the containers at minimum total traveling distance. Allocation of containers and the routes under the constraints of routing, capacity is investigated in this study. An integer programming approach has been proposed and solved.

PS16.25

June 22, 2018 | 16:00 – 18:00

Artificial Bee Colony Algorithm for Labor Intensive Project Type Job Shop Scheduling Problem: A Case Study

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Abstract: Job shop scheduling for labor-intensive and project type manufacturing is a too hard task because the operation times are not known before production and change according to the orders' technical specifications. In this paper, a case study is presented for scheduling a labor-intensive and project type workshop. The aim is to minimize the makespan of the

orders. For this purpose, the artificial bee colony algorithm (ABC) is used to determine the entry sequence of the waiting orders to the workshop and dispatching to the stations. 18 different orders and 6 welding stations are used for the scheduling in this case. The input data of the algorithm are the technical specifications (such as weight and width of the demanded orders) and processing times of the orders which vary according to the design criteria demanded by the customers. According to the experimental results, it is observed that the ABC algorithm has reduced the makespan.

PS16.99

June 22, 2018 | 16:00 – 18:00

The Optimization of Aggregate Production Planning under Fuzzy Environment: An Application Form Beverage Industry

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Abstract: Aggregate production planning (APP) can be considered as a great picture to the planning process. Rather than focusing on individual products or services, APP focuses on total or collective capacity. Therefore, it has a very important place in production and operation management functions. In the literature, different kind of methods have been proposed for the solution of APP problems. In some situations where the cost and demand parameters cannot be defined as crisp values due to the environment of the problems, fuzzy logic is used to handle the imprecise data. This paper provides a fuzzy optimization approach for aggregate production planning problems. After given information about fuzzy linear programming and solution approaches, a case study in a beverage industry is carried out. The results are analyzed using different a-cut values.

PS16.102

June 22, 2018 | 16:00 – 18:00

A Policy Proposal for Effective Energy Management

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Abstract: Effective energy management is the key to achieving national objectives and sustainability goals for governments depending on international policies. A reasonable energy management should be cost-effective, environmentally sensitive and aim to optimize the use of available resources. Fossil-based resources are not enough to meet the rapidly growing energy need. Some urgent measures should be taken against the rapid depletion of fossil fuels. In this context, it is necessary to investigate alternative energy sources. Renewable energy sources are seen as one of the most important alternative energy sources. The geographical location of Turkey provides a great advantage in renewable energy sources. However, there are some obstacles to the use of renewable energies such as market structure, political and legal regulations, the intermittent nature of renewable resources and the financial burden on technological investments. A proper energy policy should be developed considering all these factors. Research and development activities continue for new alternative energy sources. Given the diversity in the energy portfolio, new trends for alternative sources such as nuclear power plant, shale gas, wave and tidal energy are expanding. This study proposes an appropriate policy for effective energy management using some statistical tools and evaluates the current situation to reveal the future energy situation.

PARALLEL SESSION 17 | PS17

PS17.45

June 22, 2018 | 16:00 – 18:00

Air Cargo Facility Layout Planning and Meta-Heuristic Solution Approach

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Abstract: In recent years, with the increase of world trade size, the importance of the Air Cargo operations has increased even more. The rapid progression of air cargo transportation has caused development of intralogistics systems, the establishment of new facilities, the installation of new material handling equipment and facilities layout design issues. Although it is possible to reduce the system costs and increase the total cargo handling capacity with the facility layout planning (FLP) algorithms; it has been observed that the FLP algorithms have not been used in the airway cargo facilities designs. In this study, the air cargo facility design issue has been tackled as layout problem. Firstly, the existing layout algorithms in the literature have been addressed and then, FLPs have been taken into the consideration with the BlocPlan layout construction that is integrated with the Ant Colony Optimization (ACO) algorithm. In the application part of the study, Turkish Airlines data have been used and the transportation costs have been decreased with the proposed integrated FLP algorithm.

PS17.50

June 22, 2018 | 16:00 – 18:00

The Potential of Data Analytics in Disaster Management

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Abstract: In the era of social media, big data and Industry 4.0, technology has to make more contributions to help nimble decision making in response to severe disasters, both natural (including climate-related extreme events) and manmade, by providing the right solutions. Different reports and experiences originating from recent disasters and their crisis management processes have highlighted the need for a resilient and innovative disaster decision

support system, even at the modern, developed and well-equipped communities working upon real-time big data. The aim of this paper is to propose a tool to foster preparedness, response, recovery and mitigation as the fundamental steps of catastrophe management via innovation for disaster-resilient societies. The proposed tool consists of a novel conceptual hybridization of virtual experiments, machine learning, block chain and database management technologies to overcome limitations of currently used technologies. This tool will utilize innovation in information registration and distribution, data exploration and discovery for generating reliable solutions. The most impressive implications of the proposed technology is its ability to measure community sentiments, generate smartly-designed hazard scenarios and propose the best emergency evacuation plot on 3D notifications as an innovative distinct feature.

PS17.78

June 22, 2018 | 16:00 – 18:00

Technological Forecasting in Telecommunication Industry

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Abstract: Telecommunication industry, where customer focus is the main issue, has been one of the leading industries in the global economy. The world has witnessed lots of advances in the information and communication technologies soon after the first mobile dialog performed over GSM (Global System for Mobile Communications) in 1991. Then 3G (Third Generation of Mobile Telecommunications) profoundly contributed to mobility of life by providing information via the internet everywhere and all the time. Over the last few years 4G (Forth Generation) networks and smart devices have just started to dominate telecommunication industry.

All arguments stated above have made the industry players need a systematic approach in order to respond to customer requirements and expectations under

competition throughout the evolution of telecommunication technologies in the following era. Especially network operators and service providers have to make their managerial decisions based on the forecasts on this area. Undoubtedly it becomes necessary in order to invest correctly and to continue being a competitive player in the industry. As shown in the latest Ericsson Report (Figure 1), data traffic consumed by the subscribers in the world is getting higher and higher expeditiously and this increase forces the industry players to the new investments.

Eventually, the related topics in telecommunication industry are considered major areas to make forecasting and use different decision making and selection algorithms in the recent years. In this direction, there are many techniques currently used to develop technological forecasts on such topics. Finally, the main purpose of this research is to enhance the understanding of technological forecasting and explain the areas used in the telecommunication industry reviewing literature remarkably. In addition, the paper set light to the new trends and novel techniques in terms of technological forecasting in the industry.

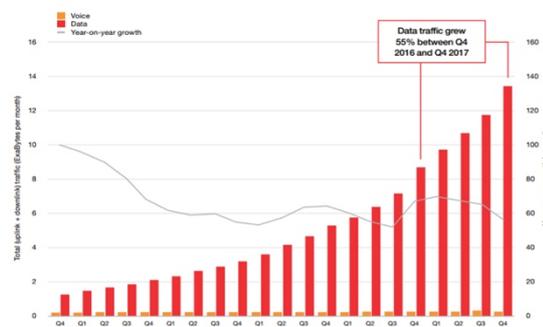


Figure 1. Ericsson traffic measurements between Q4 2012 and Q4 2017.

PS17.104

June 22, 2018 | 16:00 – 18:00

The Moderating Effect of Indulgence on the Relationships among Global Innovation Index Indicators

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Abstract: National level innovation has been studied prominently. Global indices are utilized while evaluating country level innovation. Global Innovation Index (GII) is one of the most commonly used indices in this context. Moreover, cultural dynamics also affect innovation level. Hofstede's Cultural Dimensions (HCD) is one of the outstanding guidelines on cultural dynamics of countries. In this study, infrastructure, institutions, and human capital & research are designated input indicators of GII while knowledge & technology output and creativity output are chosen output indicators of GII. Moreover, indulgence is considered as a moderator variable from HCD. Our main aim is to examine the relationships among global innovation index factors and investigate the moderating effect of indulgence on these relationships. For this purpose, we proposed a conceptual model to explore these relationships. Structural Equation Modeling (SEM) was employed in order to conduct path analysis with data from official web sites. The results show that all hypotheses related to GII factors are supported, and a moderating effect of indulgence is observed on some of the relationships. These findings indicate that countries with sufficient innovation input make transformation to innovation outputs. Furthermore, innovation leaders should be aware of societies have more indulgent score moderate several relationships.

PARALLEL SESSION 18 | PS18

PS18.20

June 22, 2018 | 16:00 – 18:00

Implementation of Lean Six Sigma for Airline Ground Handling Processes

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Abstract: Lean six sigma methodology offers a broad range of assessments and implementation services to meet the demands and challenges organizations face in today's global marketplace, where improved processes and unobstructed flow are essential elements for reducing costs and maintaining a competitive advantage. So that organizations can maximize profits and increase business value by providing knowledge and guidance on implementing continuous improvement, culture change, methodologies and tools. From this standpoint, the purpose of this study is to analyze and enhance improvements for the non-value adding processes in airline ground handling operations via lean six sigma methodology and utilization of the appropriate tools.

PS18.22

June 22, 2018 | 16:00 – 18:00

Quality Function Deployment Implementation on Educational Curriculum of Industrial Engineering in University of Gaziantep

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Abstract: The education system is one of the most important factors in achieving the level of developed countries. Higher education institutions have a very important place among educational institutions since they lead to the future. For this reason, the way to

improve the development level of countries is to increase the quality of education in higher education institutions. For this purpose, in this study, the Quality Function Deployment (QFD) approach is applied to the educational curriculum in Gaziantep Industrial Engineering Department and the results are analyzed.

PS18.43

June 22, 2018 | 16:00 – 18:00

On Copula Based Serial Dependence in Statistical Process Control

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Abstract: Copula is a distribution function on the unit hypercube with uniform margins. Margin is directly related to the stochastic behaviour of one variable, while joint distribution function covers the holistic character of more. In multivariate (and particularly bivariate) analysis, using copulas is an elegant way to solve the missing information problem between joint distribution function and the total of the margins. Hereby, the intention of this paper is twofold. Firstly, the paper intends to emphasize the advantages of copulas in practice. In order to encourage potential researchers to diversify their subject of work with these functions, authors give the essential introductory details for a clear understanding of copulas associated with their basic mathematical and statistical preliminaries. Secondly, the study exemplifies the practical usage of copulas in statistical process control area. In this context, process parameters are estimated in order to calculate the control limits of a typical Shewhart type control chart. Parameter estimation is performed by Maximum Likelihood Estimation (MLE) for the bivariate Clayton copula in univariate AR(1) time series with several different levels of high dependence. Since monitoring autocorrelated data in control charts is known as being one of the main causes of producing tighter control limits than required, false alarm rate may be increased and accordingly the performance of control charts may be dramatically decreased. This study shows that copulas may alternatively be used for getting the same or little wider acceptable region between upper and lower limits. This recognition about the properness of copulas may help to decrease some

of the negative effects of dependent data being monitored on charts for further studies.

PS18.106

June 22, 2018 | 16:00 – 18:00

Exploring the Adoption of ERP Systems: An Empirical Investigation on End-Users in an Emerging Country

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Abstract: Enterprise resource planning (ERP) is an integrated management system that aims to bring together all the data and processes of an organization. There are many factors influencing the use of ERP systems. The purpose of this study is to analyze a variety of factors that affect end-users' behavioral intention to use ERP implementation based on the technology acceptance model (TAM). Besides basic constructs of TAM, we determined other constructs such as consultant support and user guidance. The data was collected from end-users who used or have been using an ERP system in the companies. A total of 136 responses were obtained. SmartPLS software was used for the data analysis and testing of the validity of the hypotheses. The results show that perceived usefulness affect behavioral intention to use an ERP system, while perceived ease of use is not a significant determinant of ERP system usage. Moreover, both perceived ease of use and user guidance affect perceived usefulness and consultant support affect perceived ease of use.

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