

Studies in Systems, Decision and Control 347

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Technological and Industrial Applications Associated With Industry 4.0

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Introduction

Technological and Industrial Applications Associated With Industry 4.0 is a novel, innovative, and adequate source of information that compiles interdisciplinary perspectives about diverse issues related with Intelligent Logistics on different ways about Intelligent Optimization, Industrial Applications in real world, Social applications, and Technology applications, each one with a different perspective about the correct solution of this kind of methodologies. This book is a collective effort to introduce new ideas and paradigms from a variety of perspectives using innovative techniques related to Bioinspired Algorithms and methodologies associated with Artificial Intelligence. An innovative and detail book specialized in optimization that considers diverse aspects to realize a more relevant “Intelligent Optimization to improve Logistics” tries to improve with innovative techniques and methodologies in different daily aspects of our lives, in each one of them is possible understand the necessity of improve distances, time, costs, spaces and a plethora of features associated with the modern life (labor associated with delivery of goods, materials or products). We received manuscripts from renowned researchers from all around the world associated with Theoretical foundations of Logistics to understand many paradigms on different Optimization implementation kinds. In addition, we received many manuscripts with expertise on improving optimization related to Logistics of products and services, Optimization of different elements in time and location, Social Applications to enjoy our life in a better way, and finally, Technology Applications of diverse ways to increase our Life Quality. The book starts with a section entitled Mobile Applications and Web Applications to Improve Competitiveness in Industry 4.0, featuring seven chapters on the theoretical ideas related to the correct implementation of a diverse range of Logistics applications in real world Industries. The first chapter of this section is “[Implementation of an Intelligent Model Based on Convolutional Neural Network for the Detection of Diseases in Citrus Crops Caused by Bird Pests Using an Intelligent Drone](#)” which is aboard the theoretical fundamentals of an adequate decision support system under uncertainty. In the chapter “[Intelligent Application to Detection of Arachnid Bites in Children Implementing Deep Learning Techniques, an AmI-Based Solution](#)” is shown a model based on Bioinspired

Algorithms to improve a specific stochastic model demand. The chapter “[Evacuation Route Optimization in the Plaza de la Mexicanidad, Using Humanitarian Logistics](#)” is presented with a mathematical resolution to a business company. The chapter “[Automatic Fall Detection for the Care of Older Adults in Smart Cities](#)” determines actions to improvement an innovative model of humanitarian logistics considering uncertainty. The chapter entitled “[Automatic Tumor Segmentation in Mammogram Images for Healthcare Systems in Smart Cities](#)” explains different models to prevent problems with geopolitics associated with their decision support system. The chapter “[Impact of Industry 4.0: Improving Hybrid Laser-Arc Welding with Big Data for Subsequent Functionality in Underwater Welding](#)” details different strategies to models of uncertainty scenarios. Finally, the last chapter of this section entitled “[Metaheuristics for Order Picking Optimisation: A Comparison Among Three Swarm-Intelligence Algorithms](#)” explains different models to organize transportation with extra dimensions to reduce spaces.

The next section of this book is named Modern Technology Applications Including Metaheuristics and Artificial Intelligence Based Applications for Industry 4.0, featuring seven chapters related to different comparatives of Logistics in the search to improve resources in diverse aspects of our transportations or improve process to this. The chapter entitled “[Brainwaves Behavior During the Learning Curve Associated with the Manufacturing of a Product with Legos](#)” explains a model related to its routes of delay using Mathematical models and specialized software. The chapter “[Audio Features Extraction to Develop a Child Activity Recognition Model Using Support Vector Machine to Monitoring Security in a Smart City](#)” proposes an innovative Visualization Tool to analyze heuristics related to Intelligent Logistics. The chapter entitled “[Sentiment Analysis Using Natural Language Processing Through a Speech Recognition System Using a Hybrid Mobile App](#)” describes different models associated with the reactive Logistics under uncertainty situations. The chapter “[Logistics of Hospitalization Patients with COVID and Ambulances Required](#)” explains a real problem about the logistics to organize times in a novel model of humanitarian logistics in a Smart City. The chapter “[A Heuristic Method for Oil Distribution Networks Applied to the Switching Behavior in the Oil Industry](#)” details novel specifications to reduce time to distribution in a Mathematical Model. The chapter entitled “[Metaheuristics for Order Picking Optimisation: A Comparison Among Three Swarm-Intelligence Algorithms](#)” explains a model hybrid to solve problems with time and space. Finally, the last chapter in this section is “[Implementation of an Intelligent Framework for the Analysis of Body Movements Through an Avatar Adapted to the Context of Industry 4.0 for the Recruitment of Personnel](#)” which analyzes a model to control the different exogenous aspects in the selection of personnel using an intelligent avatar.

The third and final section is named Industry 4.0 Optimization and Its Future Effects on Z Generation Focused on the Paradigm Shift of an Innovation Ecosystem, featuring seven chapters related to different comparatives of Logistics Models in the search to improve resources in diverse aspects of companies and to improve our lives. The first chapter of this section is “[Selection of Factors Influencing for Reliable Electrical Power Transmission Design in Industry 4.0](#)” which explains

different models to solve general problems in Logistics. The chapter entitled “[Analysis of Transport Logistics Operations at a Link in a Reverse Supply Chain that Values Used Cooking Oil](#)” details a novel model of design of experiments to reduce costs in Logistics of services. The chapter “[The Transformation of Supply Chains in the Circular Economy from International Experiences to the Mexican Cases](#)” explains a real problem with the support to an isolated society and the best options to organize this service on the time takes as an important factor the locations and ubiquities in the Container Ship and problems of each point to send the correct goods. The chapter “[Nanostores’ Density and Geographical Location: An Empirical Study Under Urban Logistics Approach](#)” describes a model to improve times and costs associated with the management in an Aerospace project. The chapter “[Implementation of a Blockchain Model Implementation to Select the Best Bid in an Industrial Supply Chain](#)” explains a specific topic related to problems on the exogenous costs in a Vehicle routing problem in a Logistics System and its distribution of reordering industrial materials. The chapter “[Sociodemographic Analysis of the Location of MSW Collection Centers in Mexico City](#)” details a model to improve Logistics in a Smart City. Finally, in this section is presented the chapter “[Classification System to Detect Diseases in Apples by Using a Convolutional Neural Network](#),” which proposes new ideas related to the delivery of products and details a novel technique to analyze the restriction of Time Windows.

The research community must be alert to investigate all these issues in a timely fashion, opening avenues for subsequent edition of this interesting book. The chapters were selected following a rigorous analysis done by the book editors, and each chapter was double- or triple-blind peer-reviewed by at least two experts in the area.

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