

Studies in Systems, Decision and Control 347

Alberto Ochoa-Zezzatti  
Diego Oliva  
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# Technological and Industrial Applications Associated With Industry 4.0

 Springer

# **Studies in Systems, Decision and Control**

Volume 347

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Alberto Ochoa-Zezzatti · Diego Oliva ·  
Aboul Ella Hassanien  
Editors

# Technological and Industrial Applications Associated With Industry 4.0

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ISSN 2198-4182

ISSN 2198-4190 (electronic)

Studies in Systems, Decision and Control

ISBN 978-3-030-68662-8

ISBN 978-3-030-68663-5 (eBook)

<https://doi.org/10.1007/978-3-030-68663-5>

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The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

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# Evacuation Route Optimization in the Plaza de la Mexicanidad, Using Humanitarian Logistics



**María Inés Borunda-Aguilar, Iván Juan Carlos Pérez-Olguín,  
Alberto Ochoa-Zezzatti, Erwin Adan Martínez-Gomez,  
and José Alberto Hernández**

**Abstract** The article focuses on the Plaza de la Mexicanidad in Juarez City, Chihuahua. This plaza provides the town with an open area, where its inhabitants satisfy their commercial, social, cultural, recreational and family needs. Leading to large crowds of different features such as age, gender and distinct physical and emotional characteristics. Thus, providing the bases for a humanistic logistic simulation research topic for measuring the interrelated factors with the probability of occurrence of a potentially destructive phenomenon, based on the masses attitude during an event. Considering that Juarez City has a population of 1,428,508 according to the 2018 Juarez Strategic Plan report, being the largest city in the state of Chihuahua and the eight largest metropolitan area in Mexico.

**Keywords** Humanitarian logistics · Simulation · Route optimization

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