

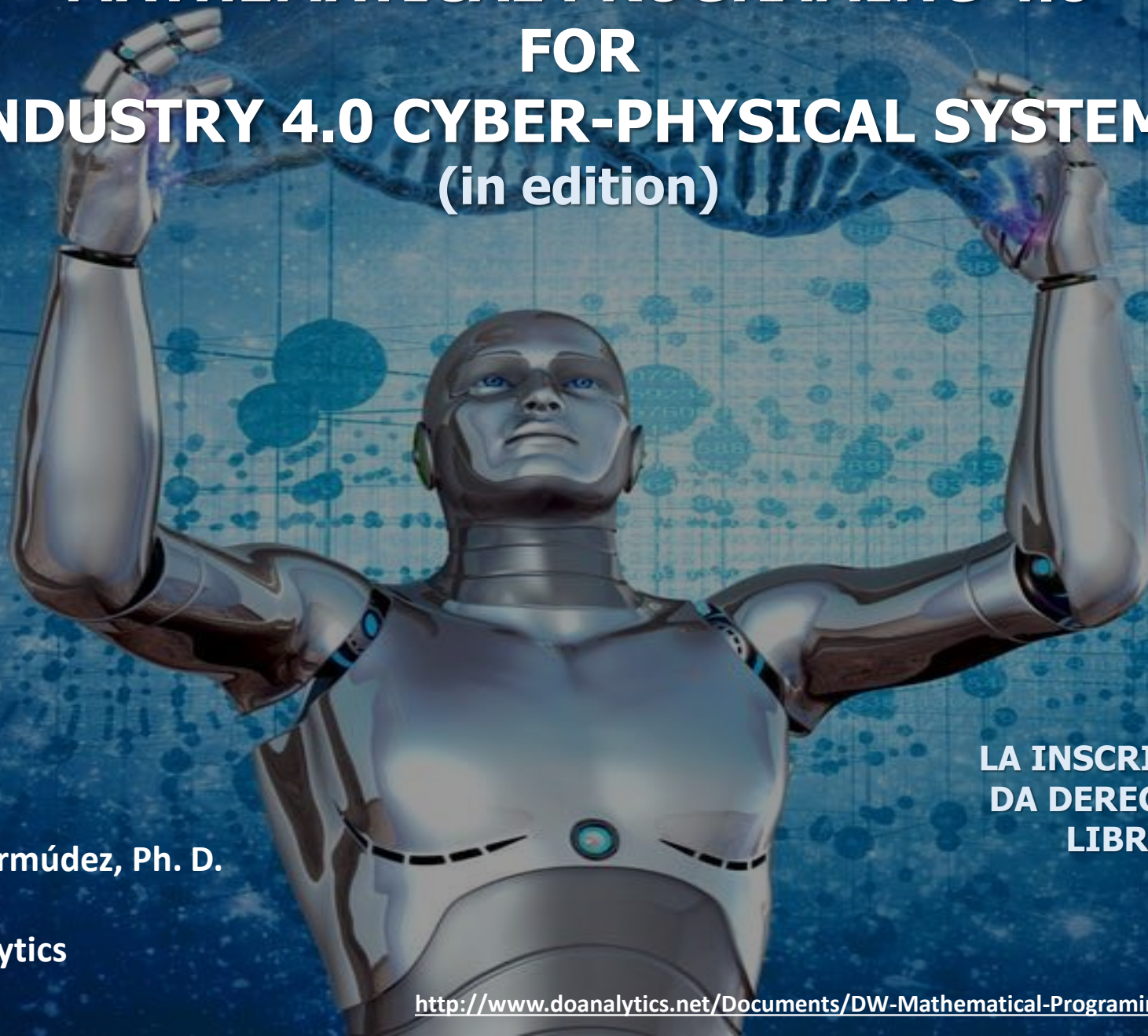


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A hand in a dark suit sleeve is holding a blue pen. A white arrow is drawn on a dark background, starting from the bottom of the word 'productivity' and pointing towards the right. The arrow is drawn with a white line that has a slight glow.

# MATHEMATICAL PROGRAMING 4.0 FOR INDUSTRY 4.0 CYBER-PHYSICAL SYSTEMS (in edition)



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Bogotá, Colombia

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Springer Optimization and Its Applications

Jesús M. Velásquez-Bermúdez · Marzieh Khakifirooz · Mahdi Fathi *Editors*

## Large Scale Optimization in Supply Chains and Smart Manufacturing

Theory and Applications

In this book, theory of large scale optimization is introduced with case studies of real-world problems and applications of structured mathematical modeling. The large scale optimization methods are represented by various theories such as Benders' decomposition, logic-based Benders' decomposition, Lagrangian relaxation, Dantzig–Wolfe decomposition, multi-tree decomposition, Van Roy' cross decomposition and parallel decomposition for mathematical programs such as mixed integer nonlinear programming and stochastic programming.

Case studies of large scale optimization in supply chain management, smart manufacturing, and Industry 4.0 are investigated with efficient implementation for real-time solutions. The features of case studies cover a wide range of fields including the Internet of things, advanced transportation systems, energy management, supply chain networks, service systems, operations management, risk management, and financial and sales management.

Instructors, graduate students, researchers, and practitioners, would benefit from this book finding the applicability of large scale optimization in asynchronous parallel optimization, real-time distributed network, and optimizing the knowledge-based expert system for convex and non-convex problems.

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Large Scale Optimization in Supply  
Chains and Smart Manufacturing

Springer Optimization and Its Applications 149

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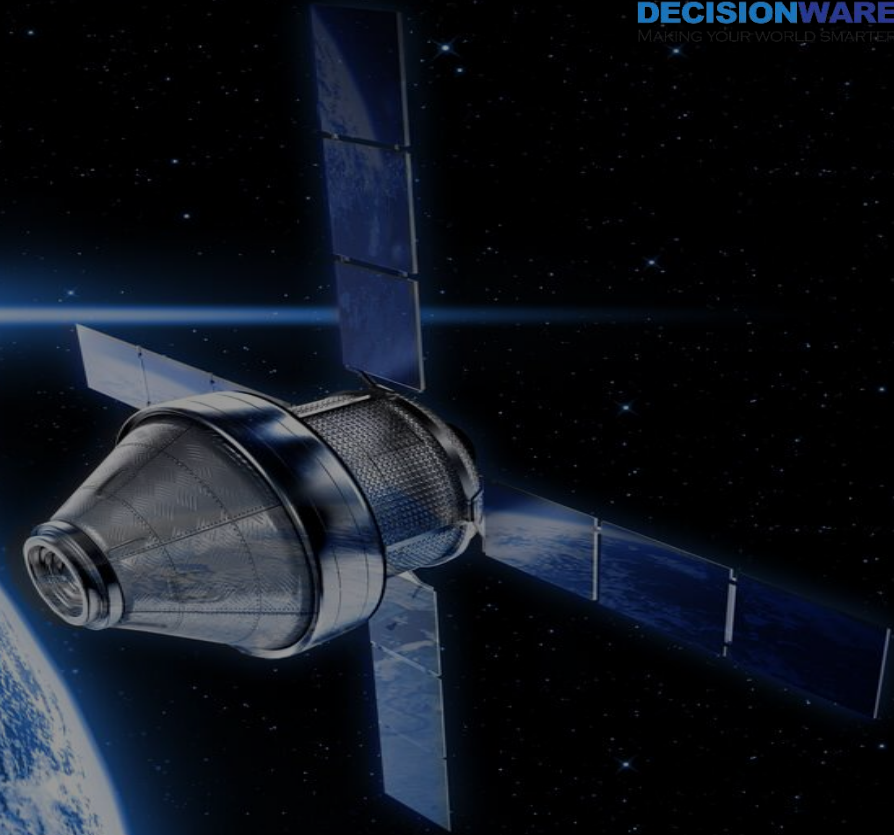


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