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Foundations of Computing and Decision Sciences
ISSN 0867-6356, e-ISSN 2300-3405

Computational Intelligence and Decision Optimization for Sustainable Supply Chains

1. AIMS AND SCOPE

The intersection of computational intelligence and decision optimization represents a critical frontier in addressing the complex challenges facing modern supply chain networks. This special issue aims to explore how advanced computational methods from artificial intelligence, machine learning, combinatorial optimization, and decision sciences can be applied to create more sustainable, resilient, and efficient supply chain systems.

Recent developments in computational intelligence have enabled more sophisticated approaches to supply chain management, particularly in addressing multi-objective optimization problems where economic, environmental, and social factors must be balanced. The COVID-19 pandemic and subsequent global disruptions have highlighted the need for supply chains that are not only optimized for efficiency but also capable of adapting to sudden changes while maintaining sustainability commitments.

This special issue seeks to advance the theoretical foundations and computational approaches for sustainable supply chain management. We welcome contributions that demonstrate novel algorithms, computational methods, decision frameworks, and optimization techniques that address the complex trade-offs inherent in sustainable supply chain networks. The focus will be on methodological innovations with clear connections to the journal's core areas of computational intelligence and decision sciences.

2. TOPICS OF INTEREST

Topics of interest include but are not limited to:

- Combinatorial optimization approaches for sustainable supply chain network design
- Metaheuristic algorithms for complex supply chain optimization problems
- Machine learning and data mining techniques for supply chain risk assessment and prediction
- Multiple criteria decision analysis frameworks for sustainable supply chain management
- Approximate reasoning and soft computing methods for handling uncertainty in supply chains
- Intelligent decision support systems for sustainable supply chain operations
- Knowledge engineering approaches for capturing supply chain expertise
- Computational complexity analysis of supply chain optimization problems
- Parallel and distributed computing approaches for large-scale supply chain optimization
- Scheduling theory and algorithms for sustainable production and distribution
- Database and data warehouse architectures for supply chain analytics
- Granular computing approaches for multi-level supply chain optimization
- Artificial intelligence applications for sustainable supply chain management
- Hybrid computational intelligence systems for supply chain decision-making
- Evolutionary computation for supply network design and optimization

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3. SUBMISSION INSTRUCTIONS

Submissions should be original, unpublished work that clearly demonstrates computational approaches, algorithms, or decision frameworks applied to sustainable supply chain challenges. All submissions will undergo a rigorous peer-review process with emphasis on methodological contributions and computational aspects.

Authors should prepare their manuscripts according to the journal's guidelines available at: http://fcds.cs.put.poznan.pl/FCDS/Submissions.aspx

Manuscripts must be submitted by e-mail to fcds@cs.put.poznan.pl with a clear indication in the cover letter that the submission is for the "Computational Intelligence and Decision Optimization for Sustainable Supply Chain Networks" Special Issue.

4. IMPORTANT DATES

Submission Deadline: 30 May 2026

First Round Review Notification: 30 July 2026

Revised Submission Deadline: 30 September 2026

Final Acceptance Notification: 30 October 2026

Publication: December 2026

5. GUEST EDITORS

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6. RATIONALE FOR THE SPECIAL ISSUE

This special issue addresses several critical gaps in the current literature:

Computational Complexity: Supply chain optimization problems often exhibit high computational complexity, requiring advanced algorithmic approaches and approximation methods.

Multi-Objective Decision Frameworks: Sustainable supply chain management inherently involves multiple conflicting objectives that require sophisticated decision analysis frameworks.

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Uncertainty Handling: Supply chains operate in highly uncertain environments, necessitating advanced computational approaches for approximate reasoning and soft computing.

Scalability Issues: Real-world supply chain networks involve large-scale optimization problems that require parallel and distributed computing approaches.

Integration of Knowledge: Effective supply chain management requires integration of diverse knowledge sources, making knowledge engineering approaches particularly valuable.

This special issue will provide a platform for researchers to address these challenges through the lens of computational intelligence and decision sciences, contributing to both theoretical foundations and practical applications.

7. EXPECTED IMPACT

We anticipate this special issue will:

- Advance the theoretical foundations of computational approaches to sustainable supply chain management
- Present novel algorithms and computational methods for complex supply chain optimization problems
- Demonstrate how decision science frameworks can address multi-objective supply chain challenges
- Foster interdisciplinary collaboration between computer scientists, operations researchers, and supply chain professionals
- Highlight emerging research directions in computational intelligence for sustainable supply chains

By bringing together cutting-edge research at the intersection of computational intelligence, decision sciences, and sustainable supply chain management, this special issue aims to make significant contributions to both theoretical knowledge and practical applications in this critical field.