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MANAGING MULTIDIMENSIONAL INTERNATIONAL WORLD WITH SPATIAL GRASP MODEL

(New book summary)

УПРАВЛІННЯ БАГАТОВИМІРНИМ МІЖНАРОДНИМ СВІТОМ ЗА ДОПОМОГОЮ МОДЕЛІ ПРОСТОРОВОГО ЗАХОПЛЕННЯ

(Короткий зміст нової книжки)

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Анотація. *«Багатовимірний міжнародний світ» стосується проблем розуміння світу через численні виміри, що виходять за рамки традиційних економічних чи політичних заходів, сприяння міжкультурній співпраці та створення систем, які збалансовують глобальну інтеграцію з місцевими потребами. Це також включає управління глобальними бізнес-операціями в різних культурах у багатополярному міжнародному ландшафті. Метою книжки є огляд та пояснення того, як організовано розподілений міжнародний світ, та дослідження потенційної застосовності, розробленої та вже перевіреної в численних застосуваннях високорівневої моделі та технології просторового сприйняття (SGT), яка може керувати складними системами за допомогою цілісного просторового підходу, ефективно охоплюючи фізичні та віртуальні виміри, їх взаємозв'язки та інтеграцію в цілому. Книжка стисло описує різні багатовимірні області з прикладами практичних рішень у цих областях та їхніх комбінаціях, використовуючи високорівневу мову просторового сприйняття (SGL) — ключовий елемент SGT. Це може дозволити створення та розподілене управління дуже великими просторовими мережами, що виражають різні виміри, які можуть самоаналізуватися, самооптимізуватися та самовідновлюватися в складних земних та небесних середовищах. Також організовувати динамічні багатомережеві рішення, що ефективно підтримують глобальну еволюцію, безпеку, процвітання та цілісність.*

Ключові слова: *багатовимірний світ, технологія просторового сприйняття, мова просторового сприйняття, розподілені мережеві операції, дослідження та управління вимірами, колективні просторові рішення, глобальна цілісність.*

Abstract. *The term «multidimensional international world» refers to understanding the world through multiple dimensions beyond traditional economic or political measures, fostering cross-cultural collaboration, and creating systems that balance global integration with local needs. This also includes management of global business operations across diverse cultures in a multipolar international landscape. The aim of this book is to review and explain how the distributed international world is organized and to investigate the potential applicability of the developed and already tested in numerous applications of high-level Spatial Grasp Model and Technology (SGT) which can manage complex systems with a holistic spatial approach effectively covering physical and virtual dimensions, their interrelations, and integration as a whole. The book briefs different multidimensional areas with examples of practical solutions in them and their combinations in a high-level Spatial Grasp Language (SGL), the key element of SGT. This can allow for the creation and distributed management of very large spatial networks expressing different dimensions, which can be self-analyzing, self-optimizing, and self-recovering in complex terrestrial and celestial environments. The book also organizes dynamic multi-networking solutions effectively supporting global evolution, security, prosperity, and integrity.*

Keywords: *multidimensional world, Spatial Grasp Technology, Spatial Grasp Language, distributed network operations, investigation and management of dimensions, collective spatial solutions, global integrity.*

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Book contents

Chapter 1. Introduction

The word «multidimensional» in relation to human societies may have different expressions. A multidimensional society is one that recognizes and analyzes complex issues through multiple perspectives, rather than a single-factor view. Multidimensional international relations recognize that global interactions involve diverse facets beyond politics and war, encompassing economic, cultural, technological, legal, social, and environmental dimensions. In terms of multidimensional diplomacy, states often negotiate with each other over more than one issue at the same time and can send signals about their resolve that have dramatic effects on other states' beliefs and actions. Managing international multidimensional worlds involves navigating complex factors that impact multinational corporations, virtual teams, and global supply chains.

Chapter 2. Different International Dimensions

Political dimension refers to various factors that shape interactions and relationships between countries, including ideology, geopolitics, security, economics, and human rights. Economic dimension shows how countries interact through economic activities like trade, investment, and finance. Security dimension refers to aspects and areas of global security, which include military, political, economic, environmental, informational (cyber), humanitarian, and biological dimensions. Legal dimension is for governing interactions between states, international organizations, and individuals across national borders. Cultural and social dimension deals with the interconnectedness of people, societies, and cultures across the globe. And technological dimension refers to the nature of technology's generation, diffusion, and application across borders, impacting international business, cooperation, and competition.

Chapter 3. Basics of Spatial Grasp Technology and its Implementation

Within Spatial Grasp Model and Technology (SGT), a high-level operational scenario expressed in recursive Spatial Grasp Language (SGL), starting in any world point or points, propagates, covers, and matches the distributed environment in parallel wave-like mode. SGT allows for direct space presence and operations with unlimited powers and parallelism. The distributed worlds effectively covered, conquered, and managed by this model include physical world, virtual world, executive world, and different kinds of their combinations. Communicating SGL interpreters can be in an arbitrary number of copies, up to millions and billions. Effectively integrated with other existing systems and communications, they are representing altogether powerful spatial engines operating without central resources or control.

Chapter 4. Basic Network Operations

It provides examples of distributed network operations expressed in SGL which can be useful for multidimensional management based on networking. These include different types of network representation, creation, finding any path between two nodes, the shortest path-tree from one node to other nodes, the shortest path between two nodes, finding the strongest sub-networks or cliques, discovering the weakest points or articulation points, and others like representing complex recursive spatial network patterns and finding effective spatial solutions by parallel and distributed pattern matching. More can be found in previous publications on SGT which may be useful for dealing with different world dimensions, like those mentioned in Chapter 2, with networks as effective models for dealing with large collections of data and their complex interrelations.

Chapter 5. Multidimensional World Management System

It briefs the main concepts of the new project oriented on the multidimensional world management under SGT, with an example of solving a practical problem between dimensions. The project consists of overlaying and communicating spatial dimensions subsystems and the Global

Management (GM) «office» enabling invasion, analysis, and optimization of different dimensions and their interactions as the unified whole. The system allows us to enter different dimensions selectively or in parallel, investigate and solve problems in them, and use solutions from one dimension for organizing operations and results in other dimensions, altogether benefitting the whole system improvement and management. For example, having received the list of names of powerful economic nodes in the economic dimension, to add additional economic-political relations between the nodes with the same name within the political dimension network.

Chapter 6. Solving Complex Multidimensional Problems

More dimensions should be considered simultaneously for advanced global solutions, rather than just two, including all mentioned in Chapter 2. Otherwise, it may potentially lead to system problems or even conflicts, and this may also depend on the globality of networks (from countries to groups of nations and up to the global world). Also, we initially organized the interdimensional solutions each time starting from and returning to the same GM. But it also may happen to be useful when interdimensional solutions are organized as self-penetrating, self-evolving, and self-organizing recursive spatial scenarios directly propagating between different dimensions. The latter may solve extremely important and complex security or defence tasks, with any number of them operating collectively and in parallel. All this can be effectively organized with the use of SGT and SGL in a distributed and combined physical and virtual environment. More multidimensional features will be investigated under SGT, including multidimensional danger, multidimensional crisis, and multidimensional stress.

Chapter 7. Conclusions

The book confirms the necessity and high importance of understanding the distributed international world through its multiple dimensions, which needs their detailed investigation both separately and collectively to guarantee the proper results. It also showed suitability of the developed SGT-SGL paradigm for investigating, modifying, and improving different dimensions and their holistic integration and management, where effective operations and solutions for the networked dimensions can be organized in parallel and distributed mode. Moreover, such solutions, potentially multiple and simultaneous, can self-spread and evolve in a holistic mode, providing the international world with powerful flexibility, security, and self-recovering features. The latest SGL version can be effectively and quickly implemented in traditional environments and recommended to different local and global institutions and organizations, UN including, to be used for the support of stability and evolution of the whole international community.

References cite the publication sources used is different chapters.

Categories describing this book

New multidimensional world vision, investigation, and understanding, universal global management model, language, technology, and their international applications.

Competitive books

Friedman G. Constraint Theory: Multidimensional Mathematical Model Management (IFSR International Series in Systems Science and Systems Engineering Book 23), 2005th Edition, Kindle Edition, Springer, April 20, 2006, ISBN-13:978-0387276502, $114.

The book is for practical engineers who want to gain greater control of multidimensional mathematical models, which become an increasingly important part of their environment. Another feature is an attempt to balance left- and right-brain perceptions, and the author noticed that many graph theory books are disturbingly light on actual topological pictures of their material.

Harris C. Hyperinnovation: Multidimensional Enterprise in the Connected Economy, Palgrave Macmillan, September 13, 2002, ISBN-13:978-0333994382, $56.

The business world has been changing at a faster rate than before and has become more complex and interdependent. This has given rise to greater opportunities for new business platforms and growth, but the need for new understanding of this complexity. Hyperinnovation provides a complete rethink of strategies for innovation in a multidimensional and connected economy.

Hurnyak I., O. Werbowa O. National Strategy and Global Competitiveness: Human Behaviour and Market Dynamics in the Age of Competition (Routledge Studies in the Modern World Economy), 1st Edition, Routledge, December 19, 2025, ISBN-13:978-1040621059, $56.

In a world shaped by geopolitical rivalries, technological disruptions, and economic volatility, strategic thinking has become essential. This book demonstrates how diverse analytical tools, including game theory, econophysics, financial econometrics, multidimensional clustering, and machine learning, lighten up complex interconnections between markets, institutional dynamics, and state behaviour.

Levaggi A.G. Confrontational and Cooperative Regional Orders: Managing Regional Security in World Politics (Routledge Global Security Studies), 1st Edition, Routledge, ISBN-13:978-0429584299, $66.

The book compares regional dynamics and studies in the transformation and authority of governing arrangements among key regional actors who manage security and institutional cooperation. This presents a novel approach to comparing non-Western regional orders, and helps forge a better integration between International Relations disciplinary approaches and area studies.

Ardalan K. Understanding Globalization: A Multi-Dimensional Approach, June 30, 2014, Routledge, ISBN-13:978-1412854030, $198.

This book discusses eight dimensions of globalization — world order, culture, the state, information technology, economics, production, and development — from the perspective of four diverse sociological paradigms: functionalist, interpretive, radical humanist, and radical structuralist. This multi-perspective approach allows readers to view globalization from a fresh angle.

Harden J.J. Multidimensional Democracy: A Supply and Demand Theory of Representation in American Legislatures, November 26, 2015, Cambridge University Press, $127.

Multidimensional democracy examines political representation from the supply (legislator) and demand (constituent) perspectives. Focusing on four dimensions — policy, service, allocation, and descriptive representation, — it documents systematic variation in what people want from legislators and what legislators choose to emphasize while in office.

Dinçer H., Yüksel S. Strategic Outlook in Business and Finance Innovation: Multidimensional Policies for Emerging Economies, April 6, 2021, Emerald Publishing Limited, ISBN-13:978-1800434462, $64.

Financial markets have developed rapidly since the 1980s, crossing national borders, and a new financial order has emerged. As a result of increasing competition in this new market, financial institutions and companies have had to improve and renew themselves. The emergence of new financial products has become essential. One of the recent trends observed in financial markets is financial innovation.

Gopinath C. Globalization: A Multi-Dimensional System, January 10, 2023, Edward Elgar Publishing, ISBN-13:978-1803926070, $105.

A multi-dimensional system provides a comprehensive understanding of the complex process of globalization and how it impacts nations, organizations, and individuals operating in its environment. The book explains why some nations welcome its benefits while others seek protection from it and provides an insightful look into arguments for and against globalization.

Wang X. Multidimensional Poverty Measurement: Theory and Methodology (International Research on Poverty Reduction), Springer, May 19, 2022, ISBN-13:978-9811911897, $119.

The book addresses the lack of poverty measurement research in China. With regard to the multi-dimensional measurement of poverty, it is clear that the situation with Chinese farmers is problematic in terms of five major aspects: sanitation facilities, health insurance, durable consumer goods, productive assets, and modern fuels. It provides clear guidance on how to improve the standards of living.

Charbonneau B., Sandor A. Comparing Armed Conflicts, July 13, 2021, Routledge, ISBN-13:978-1032016375, $202.

Comparing armed conflicts generates analytical categories that, when put into practice, can influence the course of those conflicts. Given the political dynamism of conflict space and intervention and the fact that practitioners regularly seek out academic expertise, this book discusses the possibilities and limits of comparative approaches to understanding armed conflict and intervention.

Bai L., Liang X. et al. Spatial Multidimensional Cooperative Transmission Theories And Key Technologies, World Scientific, August 24, 2020, ISBN-13:978-9811202476, $148.

This book introduces the basic theory and key technologies of the MIMO multi-antenna system, the characteristics and applications of spatial multidimensional cooperative transmission in ground-, air-, and space-based communication systems, as well as several advanced technologies for spatial multidimensional cooperative transmission from theoretical and practical perspectives.

Primary market

Universities, research centres, global economic, political, defence and military institutions, United Nations organizations, space control, international cooperation, etc.

Secondary market

Economic, political, security, cultural, military, and technological infrastructures, their integration and management.

Related conference

Geospatial Intelligence for Defence and Security, 23-25 Feb 2026, London. URL: dgi@wbr.co.uk.

Journals for reviews

Journal of Global Economy
International Journal of Global Politics and Public Administration
Multidisciplinary and Multidimensional Journal
European Journal of Spatial Development
Journal of Spatial Science
Crisis, Stress, and Human Resilience: An International Journal
International Relations and Diplomacy — and others

Professional societies

Global Management & Leadership Society
International Strategic Management Association: ISMA
Strategic Management Society
Global Forums: Council on Business & Society
Spatial Statistics Society
Spatial Econometrics Association
European Society for Spatial Biology — and others

The latest book-related journal publications

Sapaty P.S. Managing Multidimensional International World with Spatial Grasp Model. *International Relations and Diplomacy*. 2025. Vol. 13, N 5. DOI: https://doi.org/10.17265/2328-2134/2025.05.003.
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Sapaty P.S. Spatial Networking in the United Physical, Virtual, and Mental World. Springer, June 29, 2024.
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Sapaty P.S. Distributed Management with Spatial Grasp Model, 2026 (in print).