



Managing Multidimensional World with Spatial Grasp Paradigm

Article Record

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RECEIVED

2026-04-06

ACCEPTED

2026-04-16

ONLINE PUBLISHED

2026-06-10

PUBLISHED

2026-07-10

PEER REVIEW

Double Blind

Abstract

This paper is describing main ideas and content of the new book which is now in preparation. The aim of this book is to review and explain how the distributed world, international one especially, is organized and investigate potential applicability of the developed and already tested in numerous applications high-level Spatial Grasp Model and Technology (SGT). This tech, actually representing a completely new system paradigm, can manage complex systems with a holistic spatial manner effectively covering physical and virtual dimensions, their interrelations, and integration as a whole. The book will brief 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-optimising, and self-recovering in complex terrestrial and celestial environments. Also organize dynamic multi-networking solutions effectively supporting global evolution, security, prosperity, and integrity.

Multidimensional world

Spatial Grasp Technology

Spatial Grasp Language

distributed network operations

dimensions investigation and management

collective spatial solutions

global integrity

AI USE STATEMENT

No generative AI was used for analysis or results.

FUNDING

No external funding was declared for this work.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY

Not applicable for this article.

ETHICS

No ethics committee approval was required for this article type.

CONSENT

Not applicable for this article.

TRIAL REG.

Not applicable.

Crossref DOI: 10.34257/GJCSTG255855

How to Cite: Sapaty (2026). Managing Multidimensional World with Spatial Grasp Paradigm. Global Journal of Computer Science and Technology, 26(1), 22-27. DOI: 10.34257/GJCSTG255855

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Print ISSN 0975-4350



9 770975 435008

Online ISSN 0975-4172



9 770975 417011

Under the strict compliance and defined process of



METADATA CONTINUATION

AUTHOR CONTACT QR LEDGER

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ARCHIVAL RECORD

Managing Multidimensional World with Spatial Grasp Paradigm

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Abstract

This paper is describing main ideas and content of the new book which is now in preparation. The aim of this book is to review and explain how the distributed world, international one especially, is organized and investigate potential applicability of the developed and already tested in numerous applications high-level Spatial Grasp Model and Technology (SGT). This tech, actually representing a completely new system paradigm, can manage complex systems with a holistic spatial manner effectively covering physical and virtual dimensions, their interrelations, and integration as a whole. The book will brief 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-optimising, and self-recovering in complex terrestrial and celestial environments. Also organize dynamic multi-networking solutions effectively supporting global evolution, security, prosperity, and integrity.

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

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DOI

10.34257/GJCSTG255855

1. Introduction

A “multidimensional world” refers to understanding reality, systems, or data through multiple, concurrent dimensions beyond traditional three-dimensional space. It encompasses physical, virtual, social, and economic facets, often requiring holistic, networked, and AI-driven approaches. As its concretization, “multidimensional international world” refers to the world vision 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 paper is to describe main ideas and contents of the new book, currently in writing, oriented on effective management of complex multidimensional worlds, and especially their international variant, using for this the developed and tested in different countries the Spatial Grasp Technology (SGT) suitable for investigation and management of very large distributed and dynamic systems—physical or virtual—using for this self-propagating, recursive, mobile, and active patterns written in Spatial Grasp Language (SGL).

The published competitive books in this area may be found in [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11] and will be analyzed in detail in the book planned.

The rest of the paper includes the following. **Section 2** describes main ideas and concepts on which the book is based, including organization of its multidimensional management system, which is currently in development, and basics if SGT, SGL and their implementation. **Section 3** contains compact description of all seven book chapters. **Section 4** provides an exemplary multidimensional

solution in SGL, taken from one of its planned chapters, to show how the whole system may work, and **Chapter 5** names categories covering this book, its expected primary and secondary markets, international journals that may review it, also related professional societies. **Chapter 6** concludes the paper, confirming the necessity and high importance of understanding the distributed international world through its multiple dimensions, which needs detailed investigation separately and collectively to guarantee the proper world development. **References** mention competing books in this area, existing publication on SGT and SGL, as well as recently published book-related papers.

2. Basic Book Ideas and the Approach Used

2.1. Multidimensional Management System

The general view of this project organization is depicted in Fig. 1, which consists of overlaying and communicating spatial dimensions, and Global Management (GM) system allowing for entering, analyzing, and optimizing different dimensions and their interactions as the unified whole.

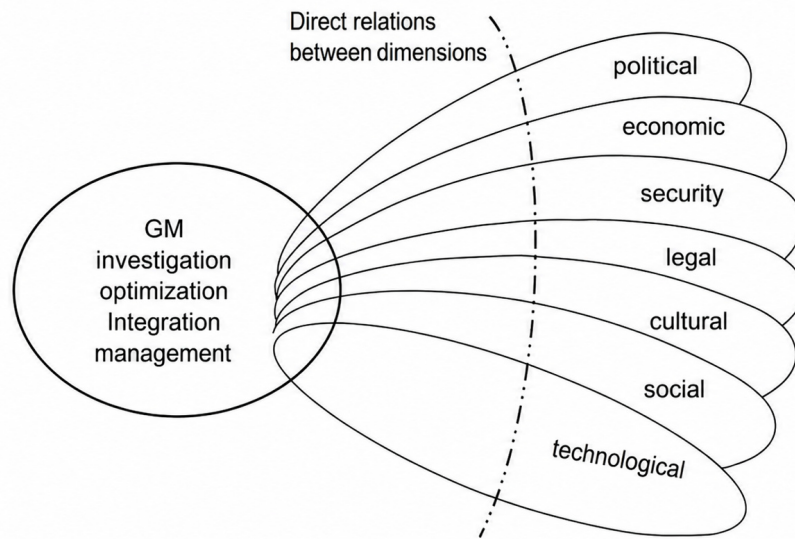


Figure 1. Multidimensional management system

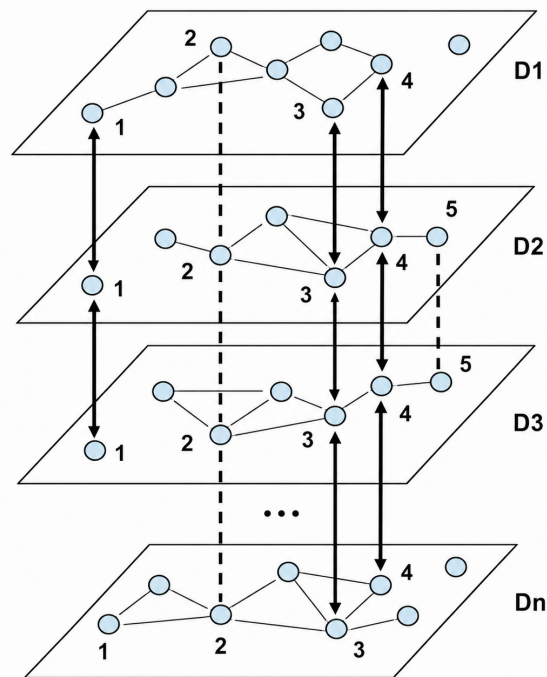


Figure 2. Interactions between dimensions

Fig. 2 shows some ideas of how different dimensions can be organized and interconnected, with direct contacts of versions of the same nodes in different dimensions. The directed arrows between node versions reflect superiority or equivalence of same named nodes in multidimensional integrity. Dashed non-oriented links show that all versions are equivalent throughout the multidimensional system. In each dimension different nodes may form arbitrary complex networks reflecting its type, ideology and operation, which may depend on interactions with nodes in other dimensions, especially same named ones. Types of relations between nodes in different dimensions may be unique for these dimensions.

2.2. Spatial Grasp Technology

Within Spatial Grasp Technology (SGT) [12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24], 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 wavelike mode*, as symbolically shown in Fig. 3. Such propagation can result in returning and analyzing the reached states and data, which may be arbitrarily remote, or to be used for launching more waves, also jointly in both cases.

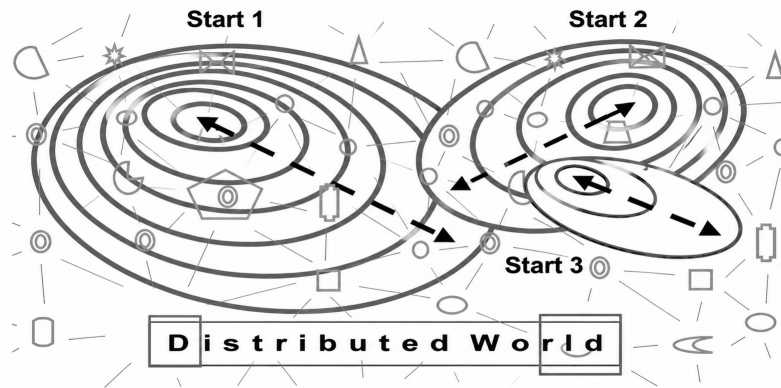


Figure 3. Parallel recursive world coverage with Spatial Grasp Model

The distributed worlds this model effectively covers, conquers, and manages may be of different types: *Physical World (PW)*, *Virtual World (VW)*, and *Executive World (EW)*. Different combinations of these worlds can also be possible within the same formalism. SGL, as basics of SGT, allows for direct space presence and operations with unlimited powers and parallelism. Its top level universal recursive organization, with operational scenarios called *grasps*, can be expressed as follows:

```
grasp → constant | variable | rule ({ grasp, })
constant → information | matter | custom | special
variable → global | heritable | frontal | nodal | environmental
rule → type | usage | movement | creation | echoing |
verification | assignment | advancement | branching |
transference | exchange | timing | qualifying
```

The SGL rules, starting in certain points, can organize navigation of the world sequentially, in parallel, or any combinations thereof. They can result in the same application points or cause movement to other points with obtained results left there or returned. The final points can become starting ones for other rules. The rules, due to recursive language organization, can form arbitrary operational infrastructures expressing sequential, parallel, hierarchical up to fully decentralized and distributed algorithms. Communicating SGL interpreters can be in arbitrary number of copies effectively integrated with other existing systems and communications, representing altogether **powerful spatial engines** operating without central resources or control.

3. Book Contents

Chapter 1: Introduction

The word “multidimensional” in relation to human societies may have different expressions. **Multidimensional society** is one that recognizes and analyzes complex issues through multiple perspectives, rather than a single-factor view. **Multidimensional international relations** recognizes that global interactions involve diverse facets beyond politics and war, encompassing economic, cultural, technological, legal, social, and environmental dimensions. In **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 dimension. **Legal dimension** is for governing interactions between states, international organizations, and individuals across national borders. **Cultural and social dimension** deals with 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 wavelike mode**. The SGT allows for the direct space presence and operations with unlimited powers and parallelism. The distributed worlds this model is effectively covering, conquering, and managing include **Physical World, Virtual World, Executive World**, and different kinds of their combinations. Communicating SGL interpreters can be in 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 presents examples of distributed network operations in SGL which **can be useful for the multidimensional management based on networking**. These include different types of network representation, creation, finding any path between two nodes, shortest path tree from a node to other nodes, shortest path between two nodes, finding strongest sub-networks or cliques, discovering weakest or articulation points, and others like representing complex recursive spatial network patterns and finding effective spatial solutions by parallel and distributed pattern matching. Many more can be found in previous SGT publications 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 briefly main concepts of the new project oriented on the multidimensional world management under SGT, with an example of solving practical problem between dimensions. The project ***consists of overlaying and communicating spatial dimensions subsystems, and the Global Management (GM) “office”*** enabling for invasion, analyzing, and optimizing 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 dimensions 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 economic dimension, to add additional economic-political relations between same named nodes within the political dimension network.

Chapter 6: Solving Complex Multidimensional Problems

More dimensions may need 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, up the global world). Also, we initially organized the inter-dimensional solutions each time starting from and returning to the same GM. But it also may happen useful when inter-dimensional solutions are organized as self-penetrating, self-evolving, and self-organizing recursive spatial scenarios ***directly propagating between different dimensions***. And the latter may be solving very important and complex security or defence tasks, with any numbers 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.

References will cite the publication sources used in different chapters.

4. An Example of a Possible Multidimensional Solution

Some drafts of possible multidimensional solutions under SGT planned in the book already appeared in the press, including in [25, 26, 27, 28, 29]. One such draft, in short, is discussed below. We will show here how the findings in one dimension can influence a solution in other dimension, considering for this a possible interplay of economic and political dimensions symbolically shown in Fig. 4.

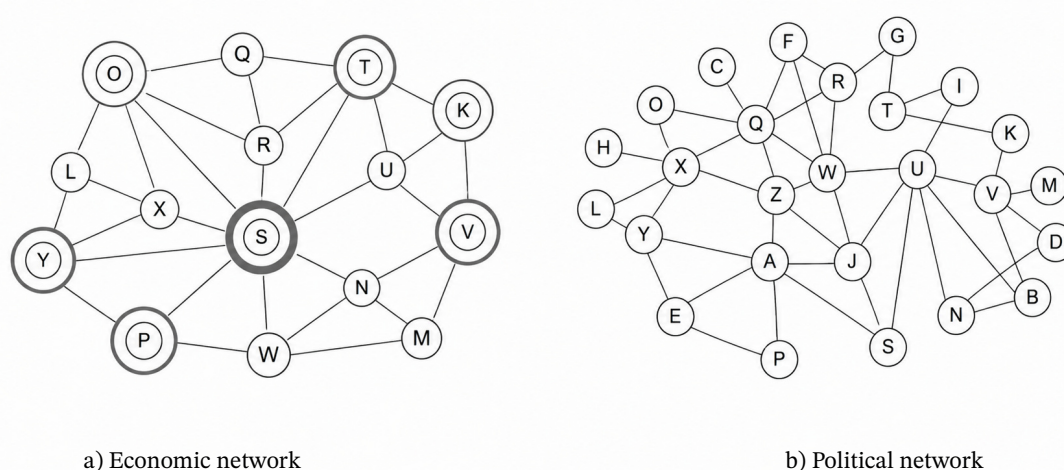


Figure 4. Economic and political network examples

We first find the most powerful economic countries using network example of Fig. 4a, which symbolically reflects economic powers of different countries by sizes of the respecting nodes. Initially staying in GM (see Fig. 1), entering the economic dimension with the registered countries-nodes in it, and then returning to GM the needed most powerful node names. Having received the

list of such names (like S, T, V, Y and P of Fig. 4a) we can add now economic-political relations (or “ecopol”) between all same named nodes within the political dimension network of Fig. 4b, with the result (in dotted links) shown in Fig. 5.

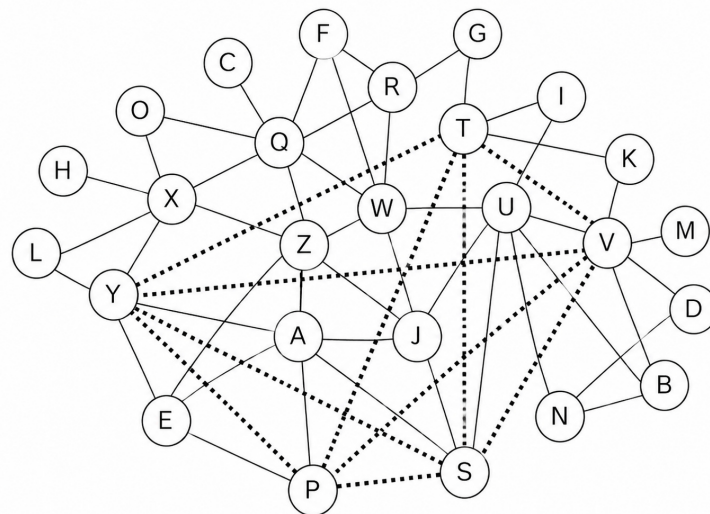


Figure 5. Adding new economic-political relations to the political network

This is believably in hope that such new links may be useful for developing both economic and political cooperation between these countries, thus benefitting the global development and prosperity. The above two-dimensional solution in SGL is extremely compact:

```
frontal(Nodes) = (enter(economic);
hop(all_nodes); POWER >= threshold; NAME);
eneter(political); hop(Nodes); split(Nodes);
if(NAME > VALUE, linkup(ecopol, node(VALUE)))
```

However, more dimensions may need to be considered for such solution, rather than just two, including others like cultural, legal, security, technology, defence, etc.

5. Book Values and External Relations

Categories describing this book may include: New multidimensional world vision, investigation, and understanding; universal global management model, language, technology, and their international applications.

Book markets can be: *Primary market* may cover universities, research centres, global economic, political, defence and military institutions, United Nations organizations, space control, international cooperation, and others; *Secondary markets* may relate to economic, political, security, cultural, military, and technological infrastructures, their integration and management.

International journals suitable for reviewing this book may include: Aeronautics and Aerospace Open Access Journal, Journal of Global Economy, International Journal of Global Politics and Public Administration, <http://multidiciplinaryjournal.com/index.php> European Journal of Spatial Development, Journal of Spatial Science, Crisis, Stress, and Human Resilience: An International Journal, International Relations and Diplomacy -- and others.

Book related professional societies may include: Global Management & Leadership Society, International Strategic Management Association: ISMA, <https://www.strategicmanagement.net/> <https://www.council-business-society.org/global-forums> Spatial Statistics Society, Spatial Econometrics Association, European Society for Spatial Biology -- and others.

6. Conclusions

The book is expected to confirm the necessity and high importance of understanding the distributed international world through its multiple dimensions, which needs detailed investigation separately and collectively to guarantee the proper world development. It should also confirm suitability and efficiency 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 fully distributed mode. And these solutions in SGL may be simpler and much more compact than with any other models and languages (by the obtained experience with solving complex tasks in any other areas, as already mentioned in [12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24]). SGT is fundamentally based on quite different world vision and understanding in comparison with other models and languages, and the world "spatial" in its name fundamentally relates to the very human existence, evolution, and activity in large distributed spaces, including finding solutions related to crises and disasters, which may need covering large physical, virtual, and emotional dimensions.

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