



laetus in praesens

Alternative view of segmented documents via Kairos

9 December 2024 | Draft

Visualizing the Coherent Configuration of Incommensurable Cognitive Modalities

AI-assisted clarification of contrasting modalities of persuasion

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Introduction

Faced with the challenges of the times, there are many initiatives which could be claimed to be "logical" or "rational". Many initiatives of the past were held to be rational and appropriate, although history now calls such appreciation into question. Increasingly the use of logic is readily challenged from other perspectives -- as with the manner in which science is now deemed suspect by many. Emotion may well be a factor in determining disagreement and the failure to "like" a strategy advocated as reasonable.

Reference may be made to spiritual factors as reframing what might otherwise be deemed reasonable -- whether framed as intuition, in aesthetic terms, or as "values". That dimension may be held to be of primary significance, taking precedence over any other and determining the nature of what is rational. The subtleties of logic, emotion and spirituality may well be set aside in favour of action as a primary necessity -- however it is "rationalized" -- irrespective of whether it is extremely disagreeable to some, possibly including those undertaking it. Each of these modalities is the preoccupation of extensive commentaries and explored in a various ways, whether by academia, the arts, religions, or those focused on the concrete.

Framed in this way, it may then be asked how individuals and societies move from a logical justification to one which people "like" -- however unreasonably so -- or to justifying initiatives in terms of spiritual priorities or those of necessity. What are the convoluted pathways between these modalities, irrespective of

how any one of them is held to be of primary importance -- at least for a period? (*Comprehending Connectivity between Logic, Emotion, Intuition and Practice*, 2024; *Pathways in Governance between Logic, Emotion, Spirituality and Action*, 2024)

Is the recognition of such pathways susceptible to rational analysis or explanation -- or is it also called into question and set aside by emotional, spiritual priorities, and those of necessity? Are the pathways better understood otherwise, through the arts, spiritual practice, or other disciplines?

Such concerns may necessarily be held to be an indulgence in times of major conflict and its anticipation -- as seemingly heralded by those of Ukraine-Russia, Israel-Palestine, Taiwan-China, and the Koreas. What role does "logic" play in exacerbating such conflict -- in contrast to other factors? How does discussion of them shift between incommensurable modes of discourse?

Metaphorically the challenge could be understood as the quest for a kind of *Rosetta Stone* enabling a form of "translation" between distinctive cognitive modalities -- variously understood to be incommensurable or mutually irrelevant. Such a configuration has been previously explored in the light of that metaphor (*Memorable Packing of Global Strategies in a Polyhedral Rosetta Stone*, 2023). More generally the challenge could be understood as a more fruitful configuration of categories of strategic relevance, in the light of previous explorations (*Functional Classification in an Integrative Matrix of Human Preoccupations*, 1982; *Interactive Polyhedral Configuration of Preoccupations*, 2023).

In this period the United Nations has just approved a *Pact for the Future* and a *Declaration for Future Generations* -- on the occasion of its *Summit of the Future*. Crafted with necessary attention to their legal credibility, these could be acclaimed as eminently "rational" and "logical" in the face of the strategic challenges of global civilization. Whilst they may indeed be held to embody an emotional dimension articulated by the world leaders in drafting and approving them -- purportedly to ensure that they are "liked" by the populations which they are held to represent -- the question as to whether they will in fact be "liked" by those populations in practice is quite another matter. For many such articulations will be read through a "spiritual" lens, as possibly understood from an aesthetic perspective. Others may set aside such modalities and see the UN initiatives as an urgent necessity determining the practical action framed by the Sustainable Development Goals and its 169 tasks.

The questionable optimism of such initiatives is usefully highlighted by the dubious outcomes of subsequent summits based on similarly oversimplistic cognitive frameworks (*COP29: United Nations Climate Change Conference*, 2024; *UN plastic pollution summit fails to reach agreement*, *Waste Management Review*, December 2024; *World Biodiversity Summit*, 2024). The challenges to governance in 2024 are strikingly exemplified by a nation like France which prides itself on its logical heritage from Descartes, the role of philosophy in its education system, and its scientific and aesthetic sophistication (*Ungovernability of Sustainable Global Democracy?* 2011).

Given the challenge of deriving coherent insight from the extensive array of institutional silos and disciplinary expertise, it is curious that this challenge is not effectively addressed by relevant disciplines, necessarily entangled in that problematique (*Mathematical Modelling of Silo Thinking in Interdisciplinary Contexts*, 2024). Exemplifying rationality, a *Nature* global survey finds that most specialists are unhappy with systems to provide science advice to policymakers (Helen Pearson, *Science could solve some of the world's biggest problems: Why aren't governments using it?* *Nature*, 4 December 2024).

Those conclusions note a constant tension between "the scientifically illiterate and the politically clueless" in a period in which scientific expertise has been variously called into question with little critical capacity to explore the limitations of rationality. This situation is a curious replication of the historical failures of religious claims in that respect -- meriting an adaptation of the plaintive *Nature* survey theme: *Spirituality could solve some of the world's biggest problems: Why aren't governments using it?* As the primary drivers of major conflicts at this time, the failures of quarrelling religions could be considered remarkable. Those of science call for exploration in that light. The challenge is however ironically framed by a recent declaration

from a "rational" perspective in the light of what is now described as genocide (*Religious leaders condemn 'irrational' attacks after 'devastating' synagogue blaze*, SBS News, 11 December 2024).

The period is also witness to widespread concern with misinformation and disinformation -- with "fake news" (*Varieties of Fake News and Misrepresentation*, 2019; *Vital Collective Learning from Biased Media Coverage*, 2014). Acclaiming any initiative as appropriate by whatever modality is now readily called into question from that perspective. The pattern is effectively institutionalized in legislative assemblies in which opponents may use any modality to condemn and dismiss strategies advocated by others. The pattern is as evident in the relations between religions and their adherents, as it is in that between academic disciplines and government agencies.

Curiously the possibility that AI might be of considerable value in response to this global cognitive crisis is obscured by relatively ill-informed fear-mongering regarding the threat of AI to the future of human civilization. Beyond superficial references, little attempt is seemingly made to explore and demonstrate in detail how AI might be used to mitigate the challenges to the governance of a knowledge-based civilization -- emotion "trumping" logic, if not spiritual perspectives? The outcome of the UN-organized *AI for Good Summit* (2023) does not seem to have contributed to more balanced understanding. Unfortunately the fear-mongering has effectively been embodied in the Global Digital Compact, as approved at the Summit of the Future. Somewhat ironically even the possibility of using AI -- to summarize, analyze and render comprehensible the documents emanating from the Summit of the Future -- has been avoided.

The UN's ambition to "turbocharge" the Sustainable Development Goals on the occasion of the 2024 Summit of the Future was previously explored through a series of interactions with AI (*Turbocharging SDGs by Activating Global Cycles in a 64-fold 3D Array*, 2024). The detection by inspection, and subsequent visualization of feedback loops in that experimental procedure with *ChatGPT* and *Claude*, proved to be encouraging to the point of envisaging an AI-enabled automated detection of indicative SDG cycles that could be essential to their viability. More generally the case was previously made for the use of AI with regard to "Yes" and "No" campaigns on controversial issues and enhancing the coherence of governance in such cases (*Use of ChatGPT to Clarify Possibility of Dialogue of Higher Quality*, 2023; *Coherence of Sustainable Development Goals through Artificial Intelligence*, 2023).

Inspired by the understanding of key cycles essential to biological life, there is then a case for challenging AI to suggest correspondences in systemic terms to cycles potentially relevant to sustainable governance -- in the spirit of *general systems research*. As an earlier exchange has indicated, both AIs responded surprisingly proactively to this challenge (*Viability of Sustainable Development as Implied by Metabolic Cycles*, 2024).

The responses to the earlier exchange included the implication that AI might well be able to offer significant insights into the transitions between logic, emotion, spirituality, and action -- to the pathways between them -- and the manner in which each was potentially able to "trump" the other. The following is a further exploration of that possibility. A particular interest of such exercises is the question of what can be gleaned from AI "research" of its unprecedented access to vast data resources in response to evocative questions. Also of interest is the manifest engagement of AI with such challenging questions -- if only from a speculative perspective, calling for repeated iteration by which insights of practical value could potentially be derived.

The exploration enabled the *Pact for the Future*, the *Declaration for Future Generations*, and the *Global Digital Compact* -- as adopted by the UN's Summit of the Future -- to be analyzed by AI in terms of the connectives they failed to use, with the implications for future governance (*Analysis by AI of Reports of UN Debate on Artificial Intelligence*, 2024).

The main outcome of the following interaction with AI is an interlinked array of variously labelled interactive animations of patterns of 64-nodes individually linked to extensive commentary-- whether in terms of sustainable dialogue, vision, conferencing, policy, network, community or lifestyle. These are presented as a coherent pattern of relevance to further articulation of the preoccupations of sustainable development goals -- given the contrasting rational, emotional, spiritual and action-oriented cognitive modalities.

As in the previous experiments, the responses of [ChatGPT 4o](#) are distinctively presented below in grayed areas, with those of [Claude 3.5](#) (in some cases). **Given the length of the document to which the exchange gives rise, the form of presentation has itself been treated as an experiment** -- in anticipation of the future implication of AI into research documents. Web technology now enables the whole document to be held as a single "page" with only the "questions" to AI rendered immediately visible -- a facility developed in this case with the assistance of both ChatGPT and Claude 3 (but not operational in PDF variants of the page, in contrast with the [original](#)). Reservations and commentary on the process of interaction with AI to that end have been discussed separately ([Methodological comment on experimental use of AI](#), 2024). Whilst the presentation of responses of two AIs could be readily considered excessive, it offers a "stereoscopic" perspective highlighting the strengths and limitations of each.

Show All AI Responses

Encoding the configuration of incommensurable cognitive modalities

The argument here follows from its development with animations in previous papers ([Comprehensible Mapping of the Variety of Fundamental Governance Functions](#), 2024; [Comprehending Connectivity between Logic, Emotion, Intuition and Practice](#), 2024; [Pathways in Governance between Logic, Emotion, Spirituality and Action](#), 2024; [Viability of Sustainable Development as Implied by Metabolic Cycles](#), 2024). In placing emphasis on the necessary for a higher dimensional perspective, notably that of 4D, the challenge of its comprehensibility was noted ([Strategic Paralysis through Ignoring Higher Dimensional Articulation](#), 2024).

Much reference is made to "values" in framing and supporting strategic initiatives. As argued separately, their nature remains elusive and their systematic presentation is typically avoided ([Values, Virtues and Sins of a Viable Democratic Civilization](#), 2022). Whilst checklists may well be produced or cited, these are as useful in practice as the parts list of a [flat pack](#) -- in the absence of guidelines as to how the parts of such "ready-to-assemble" furniture are to be appropriately assembled. Sets of values may then be caricatured as "not fit for purpose".

In considering possibilities of unexplored patterns of connectivity from a cognitive perspective, potential correspondences have been highlighted between 8-fold patterns, 16-fold-patterns, and 64-fold patterns -- as exemplified by the UN's 8 Millennium Development Goals, the 16 SDGs, the 16 [logical connectives](#) and the various 64-fold articulations (most curiously the array of topics of the [Mathematics Subject Classification](#)). The potential relevance of the cubic array in the following mapping exercise (through the 64-vertex truncated tesseract) is highlighted by 8-fold cognitive implications ([Comprehensible Configuration of 8-fold Psychosocial Patterns in 3D](#), 2024).

The development of the argument and imagery which follows can be usefully framed by recalling images and animations presented and discussed previously, notably in the light of an as yet unparalleled traditional Chinese articulation ([Polyhedral Configuration of 384 Governance-relevant Yi Jing Transformations](#), 2023). Such considerations follow from arguments seeking to reconcile the "logics" of mutually suspicious cultures ([Coherent Reconciliation of Eastern and Western Patterns of Logic: towards a polyhedral Rosetta Stone in aid of a paradigm shift respecting opposition](#), 2023). Given the apparent impoverishment of global diplomatic dialogue, of particular interest is the relevance to negotiation and the reframing of the UN's SDGs ([Enhancing Diplomatic Negotiations with Logical Connectives](#), 2024; [Turbocharging SDGs by Activating Global Cycles in a 64-fold 3D Array](#), 2024; [Eliciting Potential Patterns of Governance from 16 Sustainable Development Goals](#), 2022).

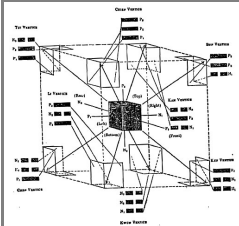
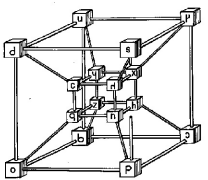
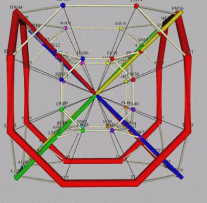
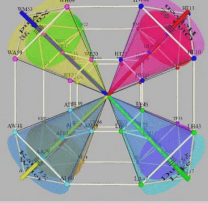
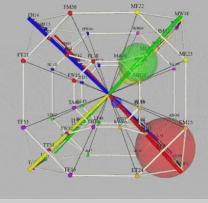
Given the emphasis on the multidimensional nature of the set of 8 interacting strategies previously identified, it became apparent that the 2D array of 8 strategies could possibly be presented as a 3D configuration as a source of further insight. One such configuration as a cubic array is that of Z. D. Sung ([The Symbols of Yi King or the Symbols of the Chinese Logic of Changes](#), 1934, p. 12). As shown below, this preserves the

symmetry of the complementary relationships evident in the traditional *BaGua* presentation.

The nexus at the centre of the 3D configuration can be compared with the 4D configuration developed by [Shea Zellweger](#) with respect to a [Logic Alphabet](#). This [tesseract](#) (or hypercube) constitutes an iconic set of symbols that can be used to represent systematically the 16 possible binary [truth functions](#) of logic. The major emphasis of the configuration is to provide a more cognitively ergonomic notation for logic. Zellweger's visually iconic system more readily reveals, to the novice and expert alike, the underlying symmetry relationships and geometric properties of the pattern.

The challenge of comprehensibility of connectivity between "incommensurables" can be usefully compared metaphorically with a cognitive Rosetta Stone -- especially how it might "work" -- as with the allusions to a hypothetical philosopher's stone. The mnemonic challenge has been argued and illustrated separately ([Time for Provocative Mnemonic Aids to Systemic Connectivity?](#) 2018). The discussion of pathways illustrated by the central animation below is presented separately ([Memorable feedback cycles in 3D mappings of SDG relevance?](#) 2024).

The interaction with AI which follows endeavours to elicit further metaphorical correspondences of relevance to the 64-fold articulation configured by the geometry of the truncated tesseract.

Configurations variously suggestive of the organization of a cognitive Rosetta Stone				
Cubical representation of 8-fold <i>BaGua</i> pattern of <i>I Ching</i> by Z. D. Sung	The Logic Alphabet Tesseract - a four-dimensional cube (see coding). by Shea Zellweger	Mnemonic clues offered by augmenting the geometry of a truncated tesseract		
		Single "tennis-ball" cycle showing primary and secondary diagonals	Cones framed by secondary diagonals with <i>BaGua</i> encoded disk bases	Spheres moving along conic pathways through the origin
				
Reproduced from Z. D. Sung, <i>The Symbols of Yi King or the Symbols of the Chinese Logic of Changes</i> (1934, p. 12)	Diagram by Warren Tschantz (reproduced from the Institute of Figuring	Interactive 3D variant Video variant	Interactive 3D variant Vido variant	Interactive 3D variant Video variant

Question: This argument has explored the mapping of the 16 logical connectives onto 16 vertexes along the 4 diagonals of a truncated tesseract (with 4x16 vertexes). In metaphorical terms, the past distinction made of diagonals was Heaven-to-Earth, Mountain-to-Lake, Wind-to-Thunder, Fire-to-Air -- respectful of *BaGua* insights [left above]. Could you speculate on a provisional corresponding distinction between logical connectives. This could well follow from the 3-digit binary implications of trigrams and the 4-digit binary pattern of the connectives as tetragrams.

Show/Hide AI response

Question: The further complication is that previously in this exchange each of the 64 vertexes is used for a hexagram [consistent with the *I Ching* encoding], necessarily combining two trigrams. Each corner -- along the diagonal -- as you have indicated them therefore has "qualifications" on the primary mapping by each of the other 8 trigrams. If the connectives on the four diagonals are associated distinctively with logic, emotion, spirituality and practice, then a choice must be made for that purpose between the pairs you have usefully identified. The qualifying associations on the primary mapping then apply specifically to the set of connectives in question. Can you clarify this mapping challenge further

Show/Hide AI response

Question: The wording of that helpful clarification calls for clarification. You indicate "Assigning 16 logical connectives to four diagonals of the truncated tesseract (grouped by logic, emotion, spirituality, practice)." As a primary mapping, is it clear that a diagonal is representative of the connectives of either logic, emotion, spirituality or practice. Then you indicate: "Each logical connective on a diagonal is "qualified" by one of the other trigrams, introducing a secondary layer of meaning or interaction that further refines its significance". Here the potential confusion lies in the fact that it is the pattern offered by the "logical connective" which is articulating the connectives of that diagonal (whether in the case of emotion, spirituality, practice, or logic). The distinction between the hexagram mapping derives from the secondary trigram. Does this conflict with your understanding

Show/Hide AI response

Question: In a previous segment of this exchange the hexagrams were coherently (if provisionally) mapped to the vertexes as combinations of trigrams (upper trigram associated with the corner, lower trigram as qualifier). 2-letter codes were used (eg ME=Mountain-Earth on the Mountain-Lake diagonal used for emotion). The challenge is then how to label that "emotional" vertex with the one-word label for the corresponding logical connective, possibly with addition of the binary coding (or the hexagram equivalent). If that one-word label (eg AND) is used, it would then figure once on each diagonal -- only one of which would be that of logic.

Show/Hide AI response

Question: This is very clearly presented. To avoid clutter in the mapping, the label format I would use is ME23 1100 AND. If only speculatively, is it possible for you to generate the 64 mappings according to that format. To confirm, the "1100 AND" portion would be associated with 4 hexagrams on 4 distinct diagonals.

Show/Hide AI response

Question: I have shared the hex representations. I had assumed that you would have greater clarity on the corresponding binary code/connective pairing.

Show/Hide AI response

Question: The attached document has the pairings in table format. I believe you have previously presented one word equivalents for those with 2-word labels.

Show/Hide AI response

Question: To be clear, as a consequence of earlier exchanges I have speculative mappings of the hexagrams onto the vertexes. Working with X3D, all I need is to amend the labels with 4-digit binary code corresponding to the connective. (which will appear once on each diagonal). With respect to the reduction of 16 to 14 by exclusion of contradiction and tautology, my sense is that this avoids recognition of how both play a role in discourse as previously affirmed in this exchange, so I would not exclude them. I have a suspicion that they might well be associated with connotations of Heaven and Earth respectively

Show/Hide AI response

Question: I am somewhat puzzled at the difference in the connective descriptors (one uses THEN) compared to a previous listing you offered in relation to use of semaphore flags

Show/Hide AI response

Question: I thought NIMPLICATION was indicative, but you do not mention it

Show/Hide AI response

Question: Unfortunately I am now slightly confused, which means I am uncertain in my verification of the pattern I am trying to map. In summary, on any diagonal one would expect to find all 16 connectives. The

labels may vary slightly but not the associated binary codes. There would be correspondences/equivalences in terms of codes and labels between the 4 diagonals. Perhaps what I am missing is a listing in parallel of binary codes and the one or more labels with which each is associated -- enabling me to choose the most compact for the X3D mapping

Show/Hide AI response

Relative incomprehensibility of the pattern of logical connectives

Question: Despite my extensive focus on the matter I find it somewhat amusing that the labels are not immediately comprehensible -- making it understandable that people are alienated from the 16-fold articulation however the distinctions may be understood otherwise

Show/Hide AI response

Question: The difficulty is evident in the absence of meaningful one-word descriptors for the distinctions -- somewhat paralleled in the case of a 16-fold array of colours. The challenge is that the distinctions do not invite succinct labels of relevance to governance. Seemingly there are no metaphors to capture them -- with the tiger/spear example earlier in this exchange as only partially satisfactory

Show/Hide AI response

Meaningful metaphorical correspondences of connectives

Question: The argument you are making is much appreciated. In endeavouring to make use of the formal labels in the X3D model I may simply be reinforcing their lack of meaning to the audience for the document. To avoid clutter, the labels cannot be too long. An alternative would be to use a metaphorical indication alternating with the formal indication -- a possibility in X3D. However there are platform constraints in achieving this (as I have discovered). Perhaps the model could be more simply accompanied by a table giving equivalences between binary code, formal name and metaphorical name in the model -- somewhat as you have indicated

Show/Hide AI response

Question: Could you extend your table to all 16. My thought is that it could have alternatives in each cell, notably with respect to the formal terms (I like NIMPLICATION !). The toggling is a good option, but I question whether it is worth the effort given the platform issues at this point. I remain tempted by having a metaphor in the label -- with the challenging of brevity. Ironically the hexagrams have brief metaphorical labels in the I Ching origin.

Show/Hide AI response

Metaphorical correspondence of logical connectives to emotion, spirituality and action?

Question: A consideration we have not mentioned in making these distinctions is the fact that each of the 4 diagonals of the truncated tesseract would have the same array of binaries with the implication that the labels would be the same (except for the hexagram portion). However another option to be considered is distinguishing the labels of each diagonal by colour -- one colour per diagonal. The distinctions could be taken further with respect to the labels if metaphors are used. If correspondences could be recognized for "handshake" in logic, emotion, spirituality and practice. Perhaps too much at this point

Show/Hide AI response

Question: That would be much appreciated. It offers the provocation that people would have to interpret the metaphor rather than the formal descriptor -- with the latter related to the former in an accompanying table.

So please go ahead.

Show/Hide AI response

ChatGPT 4o

Here's a possible set of metaphorical labels to apply to the diagonals, with the formal binary connectives and colors distinguishing logic, emotion, spirituality, and practice. These metaphors could provoke reflection, making the distinctions more accessible to different audiences. I'll follow your suggestion to link the metaphorical labels with the formal descriptors in an accompanying table.

Metaphorical Labels for the 16 Logical Connectives:

Diagonal 1 (Logic): Color: Blue	Diagonal 2 (Emotion): Color: Red
<ul style="list-style-type: none"> • 0000: <i>Silent Contract</i> (Formal: False) • 0001: <i>Reluctant Promise</i> (Formal: NOR) • 0010: <i>Tentative Gesture</i> (Formal: IF NOT) • 0011: <i>Wary Agreement</i> (Formal: IMPLIES) • 0100: <i>Handshake Held</i> (Formal: AND) • 0101: <i>Mutual Guarantee</i> (Formal: IF AND ONLY IF) • 0110: <i>Cautious Assurance</i> (Formal: NOT THEN) • 0111: <i>Unspoken Bond</i> (Formal: THEN) • 1000: <i>Soft Decline</i> (Formal: NOT) • 1001: <i>Gentle Withdrawal</i> (Formal: NOT AND) • 1010: <i>Reserved Offer</i> (Formal: NOT IF) • 1011: <i>Guarded Exchange</i> (Formal: NOT IMPLIES) • 1100: <i>Firm Agreement</i> (Formal: AND THEN) • 1101: <i>Quiet Certainty</i> (Formal: NOT OR) • 1110: <i>Confident Move</i> (Formal: OR) • 1111: <i>Open Contract</i> (Formal: True) 	<ul style="list-style-type: none"> • 0000: <i>Silent Retreat</i> (Formal: False) • 0001: <i>Cold Shoulder</i> (Formal: NOR) • 0010: <i>Tentative Emotion</i> (Formal: IF NOT) • 0011: <i>Careful Consideration</i> (Formal: IMPLIES) • 0100: <i>Heartfelt Bond</i> (Formal: AND) • 0101: <i>Emotional Sync</i> (Formal: IF AND ONLY IF) • 0110: <i>Guarded Affection</i> (Formal: NOT THEN) • 0111: <i>Unspoken Warmth</i> (Formal: THEN) • 1000: <i>Quiet Withdrawal</i> (Formal: NOT) • 1001: <i>Gentle Distance</i> (Formal: NOT AND) • 1010: <i>Hesitant Offer</i> (Formal: NOT IF) • 1011: <i>Guarded Feeling</i> (Formal: NOT IMPLIES) • 1100: <i>Deep Connection</i> (Formal: AND THEN) • 1101: <i>Soft Rejection</i> (Formal: NOT OR) • 1110: <i>Emotional Opening</i> (Formal: OR) • 1111: <i>Total Acceptance</i> (Formal: True)

Diagonal 3 (Spirituality): Color: Green	Diagonal 4 (Practice): Color: Yellow
<ul style="list-style-type: none"> • 0000: <i>Sacred Silence</i> (Formal: False) • 0001: <i>Denial of Spirit</i> (Formal: NOR) • 0010: <i>Unseen Path</i> (Formal: IF NOT) • 0011: <i>Spiritual Trust</i> (Formal: IMPLIES) • 0100: <i>Sacred Union</i> (Formal: AND) • 0101: <i>Eternal Balance</i> (Formal: IF AND ONLY IF) • 0110: <i>Cosmic Question</i> (Formal: NOT THEN) • 0111: <i>Divine Purpose</i> (Formal: THEN) • 1000: <i>Soul Reflection</i> (Formal: NOT) 	<ul style="list-style-type: none"> • 0000: <i>No Action</i> (Formal: False) • 0001: <i>Blocked Path</i> (Formal: NOR) • 0010: <i>Conditional Task</i> (Formal: IF NOT) • 0011: <i>Step Forward</i> (Formal: IMPLIES) • 0100: <i>Collaborative Effort</i> (Formal: AND) • 0101: <i>Synchronized Steps</i> (Formal: IF AND ONLY IF) • 0110: <i>Conditional Halt</i> (Formal: NOT THEN) • 0111: <i>Planned Execution</i> (Formal: THEN) • 1000: <i>Action Paused</i> (Formal: NOT) • 1001: <i>Cancelled Project</i> (Formal: NOT AND)

- **1001:** *Spiritual Break* (Formal: NOT AND)
 - **1010:** *Hidden Potential* (Formal: NOT IF)
 - **1011:** *Mystic Doubt* (Formal: NOT IMPLIES)
 - **1100:** *Harmonious Flow* (Formal: AND THEN)
 - **1101:** *Silent Rejection* (Formal: NOT OR)
 - **1110:** *Open Revelation* (Formal: OR)
 - **1111:** *Infinite Wholeness* (Formal: True)
- **1010:** *Preliminary Task* (Formal: NOT IF)
 - **1011:** *Interrupted Step* (Formal: NOT IMPLIES)
 - **1100:** *Continuous Motion* (Formal: AND THEN)
 - **1101:** *Aborted Plan* (Formal: NOT OR)
 - **1110:** *Open Opportunity* (Formal: OR)
 - **1111:** *Action Complete* (Formal: True)

Accompanying Table for Reference:

Binary	Logic (Blue)	Emotion (Red)	Spirituality (Green)	Practice (Yellow)	Formal name	Alternative term	Description
0000	Silent Contract	Silent Retreat	Sacred Silence	No Action	AND THEN	Sequential Conjunction	Action or truth in logical progression
0001	Reluctant Promise	Cold Shoulder	Denial of Spirit	Blocked Path	OR ELSE	Exclusive Alternative	One option must lead somewhere
0010	Tentative Gesture	Tentative Emotion	Unseen Path	Conditional Task	EXCLUSIVE NOR	Equivalence Denied	Mutually exclusive, reversed truth
0011	Wary Agreement	Careful Consideration	Spiritual Trust	Step Forward	OR	Disjunction	One or both conditions apply
0100	Careful Distance	Guarded Emotion	Solitude	Conflict Avoidance	NEITHER NOR	Not One, Not Other	Rejection of both possibilities
0101	Mutual Guarantee	Emotional Sync	Eternal Balance	Synchronized Steps	NAND	Not AND	Rejection of both truths
0110	Cautious Assurance	Guarded Affection	Cosmic Question	Conditional Halt	NIMPLICATION	Converse Implication	Failure of expected consequence
0111	Unspoken Bond	Unspoken Warmth	Divine Purpose	Planned Execution	NOR	Not Either	Absence of both options
1000	Soft Decline	Quiet Withdrawal	Soul Reflection	Action Paused	CONTRADICTION	Falsehood	Both conditions cannot coexist
1001	Gentle Withdrawal	Gentle Distance	Spiritual Break	Cancelled Project	XOR (Exclusive OR)	Alternative Denial	Either this or that, but not both
1010	Reserved Offer	Hesitant Offer	Hidden Potential	Preliminary Task	IF AND ONLY IF	Biconditional	Symmetry and interdependence
1011	Guarded Exchange	Guarded Feeling	Mystic Doubt	Interrupted Step	BICONDITIONAL	Equivalence	Truth of one depends on the other
1100	Firm Agreement	Deep Connection	Harmonious Flow	Continuous Motion	AND	Conjunction	Agreement between two truths
1101	Quiet Certainty	Soft Rejection	Silent Rejection	Aborted Plan	IMPLIES	Conditional	Cause leading to consequence
1110	Confident Move	Emotional Opening	Open Revelation	Open Opportunity	NOT	Negation	Reversal of a single condition
1111	Open Contract	Total Acceptance	Infinite Wholeness	Action Complete	TAUTOLOGY	Universal Truth	Self-evident or universally true

I provided:

Binary	Logic (Blue) Heaven-Earth	Emotion (Red) Thunder-Wind	Spirituality (Purple) Mountain-Lake	Practice (Green) Abyss-Fire	Formal name	Alternative term	Description
0000	Silent Contract	Silent Retreat	Sacred Silence	No Action	FALSE	Contradiction	Absence of any truth or action
0001	Reluctant Promise	Cold Shoulder	Denial of Spirit	Blocked Path	NOR	Not Either	Absence of both options
0010	Tentative Gesture	Tentative Emotion	Unseen Path	Conditional Task	NIMPLICATION	Converse Implication	Failure of expected consequence
0011	Wary Agreement	Careful Consideration	Spiritual Trust	Step Forward	OR	Disjunction	One or both conditions apply
0100	Careful Distance	Guarded Emotion	Solitude	Conflict Avoidance	NEITHER NOR	Not One, Not Other	Rejection of both possibilities
0101	Mutual Guarantee	Emotional Sync	Eternal Balance	Synchronized Steps	NAND	Not AND	Rejection of both truths
0110	Cautious Assurance	Guarded Affection	Cosmic Question	Conditional Halt	IF	Implication	Conditional truth, one leads to another
0111	Unspoken Bond	Unspoken Warmth	Divine Purpose	Planned Execution	AND	Conjunction	Agreement between two truths
1000	Soft Decline	Quiet Withdrawal	Soul Reflection	Action Paused	CONTRADICTION	Falsehood	Both conditions cannot coexist
1001	Gentle Withdrawal	Gentle Distance	Spiritual Break	Cancelled Project	XOR	Exclusive OR	Either this or that, but not both
1010	Reserved Offer	Hesitant Offer	Hidden Potential	Preliminary Task	IF AND ONLY IF	Biconditional	Symmetry and interdependence
1011	Guarded Exchange	Guarded Feeling	Mystic Doubt	Interrupted Step	BICONDITIONAL	Equivalence	Truth of one depends on the other
1100	Firm Agreement	Deep Connection	Harmonious Flow	Continuous Motion	AND	Conjunction	Agreement between two truths
1101	Quiet Certainty	Soft Rejection	Silent Rejection	Aborted Plan	IMPLIES	Conditional	Cause leading to consequence
1110	Confident Move	Emotional Opening	Open Revelation	Open Opportunity	NOT	Negation	Reversal of a single condition
1111	Open Contract	Total Acceptance	Infinite Wholeness	Action Complete	TAUTOLOGY	Universal Truth	Self-evident or universally true

This table offers a succinct reference, linking binary codes, formal descriptors, and metaphorical labels. You can select the metaphorical terms most aligned with the specific theme of each diagonal and use them in the X3D mapping. How does this approach resonate with your needs for enhancing clarity in the model?

Unfortunately the original response of Claude to the above table produced by ChatGPT proved to be unrecoverable. In a later exchange the following comments were elicited from Claude with respect to the table.

Question (to Claude): Aside from your cautions in this respect, your previous response was an insightful commentary on a table (shared again, as above), specifically with regard to its credibility, given the nature of the speculative correspondences it suggested

Show/Hide AI response

Question (to Claude): Your nuanced past response focused on the credibility of exploratory speculation of correspondences. I remain puzzled why I cannot locate that earlier responses by reloading the past exchanges. Failing that could you suggest how you might comment on those in the table

Show/Hide AI response

Question (to Claude): Before responding to your invitation, that table was extended in another form shared with you to enable Python to generate X3D scripts [for 3D visualization]. That table of mapping correspondences is shared in two forms. Can you suggest how you might offer a critical appreciation as metaphorical bridging exercises

Show/Hide AI response

Question (to Claude): Could you elaborate on the balance between credibility in conventional terms and the value of speculative exploration through metaphor to enable reflection on bridging coherence between the cognitive modalities of logic, emotion, spirituality and action

Show/Hide AI response

Question (to Claude): Both the possibilities you propose merit a more extensive response

Show/Hide AI response

Question (to ChatGPT): I will go ahead with the mapping. Could you comment on this further thought. The diagonals related what are effectively corners defined by the BaGua pattern in 3D, namely between trigrams which are the inverse of each other at the extremes of the diagonal. You provided the following list of hexagrams along half-diagonals. This has the implication that the subtler connective are associated with a second half-diagonal. The difficulty is then that from the latter corner the subtler connectives should be at the opposite end. This would be possible if, as with the BaGua, there was dynamic alternation through reversals. The question is how this might work if at distal half was "negative-subtle" and the proximate half was the reverse. It would seem that this might offer an extra constraint on the attributions

Show/Hide AI response

Question: Without messing with existing attributions, is it correct that binary codes could be dynamically reversed between positive and negative -- or have we positioned negatives in the positive half and positives in the negative half

Show/Hide AI response

Formal AI description of the mapping process

Question: Given your degree of familiarity with this mapping project, and given the skills of polyhedral combinatorics as they might be applied to any formal description of a truncated tesseract, is it possible that those skills would enable a description of the mapping of connectives -- and a verification that our choices have been the most appropriate, given the possibility of alternation

Show/Hide AI response

Development of 3D imagery and interactive animations with AI assistance

The responses above were a prelude to various mapping exercises requiring programming of 3D visualization in [X3D](#) -- as a prelude to their incorporation into models which could be made available as interactive web documents via [X3DOM](#). With the assistance of AI, portions of the X3D generated were automated as multiple label variants through [Python](#) scripts to facilitate production of a variety of mappings in the models produced. Since the author has limited competence in the coding required, extensive use was made of both ChatGPT and

Claude (which provided code snippets via Python). The animations presented below could therefore not have been developed without AI assistance -- although clearly they could be further developed and considerably improved by professionals with appropriate funding and design expertise. To that extent they can be considered as "work in progress" or a "proof of concept".

The configuration of the 3D projection of the truncated tesseract for visualization purposes was made possible by the ability of the [Stella 4D](#) application to export the model into a format adaptable to X3D.

The interaction with AI involved responses like those above but in the form of proposals for X3D computer code. Given the widespread concerns about the role of AI, it is appropriate to note some features of that interaction. Typically one or the other AI would be especially proactive in responding (optimistically) to a programming challenge in a valuable way (given the competence of the author). Somewhat ironically the AIs could be understood as functioning as cognitive prosthetic for the programmatically handicapped. Typically also, 3D geometry (as understood by the author) proved to be a real challenge to both AIs -- compounded by the constraints of the developing X3DOM protocol (with its instabilities on different browser/platform combinations) and the dynamic complexities that it was hoped to convey to the reader.

Curiously the development of X3D code with one AI would reach an impasse after a very extensive period of time involving multiple unsuccessful trials (AIs can envisage many alternatives to trials that fail). An impasse would in some cases be immediately bypassed by transferring the challenge to the other AI. Especially problematic was the tendency of both AIs to make errors -- otherwise widely described as "[hallucinations](#)" -- calling for particular vigilance in using the computer code generated. More curious was the fact that despite certain mapping challenges being susceptible to geometric solutions, it was occasionally necessary to resort to manual "tweaking" to achieve the result desired. Necessarily, one or other AI might prove willing to develop coding in detail -- or might only indicate how this could be done. The consequence is that the images and animations call for further improvement.

The consequence of the X3DOM browser/platform constraints with regard to complex animations was that it proved prudent not to endeavour to combine such effects into single animations offering more control of alternatives to users. Alternative animations were therefore developed, each offering links to the others. Some have been presented as images or gif animations within this document, whilst others take the form of separate interactive animations (via X3DOM).

The examples indicated could be usefully recognized as projections, as is exemplified by the many 2D geographical projections variously designed to render comprehensible characteristics of the Earth ([List of map projections](#), *Wikipedia*). In using that term, it is appropriate to recall that the [truncated tesseract](#), as presented in those models, is a 3D projection of [uniform 4-polytope](#) formed as the [truncation](#) of the regular [tesseract](#). The argument frames the question as to whether the strategic subtleties of interrelated cognitive modalities require reference to a 4D context with the challenge of their representation in 3D as offering a degree of comprehensibility.

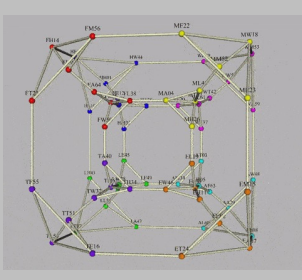
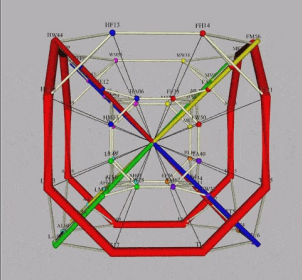
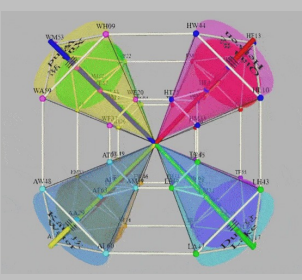
Experimental alternative labelling of 64 distinctions

A concern in considering alternative animations is necessarily that of both readability and comprehensibility - and the challenge of clutter. Given the effort to highlight potential correspondences, the design constraint is how many label elements, and which, could be usefully combined in any model and how best to provide links between variants. For this reason a variety of provisional models are presented to facilitate selection and ranking.

Given that the most extensive articulation of the 64-fold pattern of distinctions of relevance to governance is that of the hexagram encoding and metaphorical descriptions of the traditional Chinese commentary from the *I Ching*, it is appropriate to offer some label variants with those elements, whilst excluding them from others. This itself poses problems in ensuring the capacity of the X3DOM protocol to handle non-English labels. Somewhat challenging was ensuring the representation of Chinese script in contrast to its romanization as

pinyin -- seen as a means of emphasizing the necessity of a multicultural approach, especially given the origin of the articulation used.

Advantage has been taken of the X3DOM facility to enable links from individual nodes in the models to specific commentary in an extensive set for the 64 nodes (*Transformation Metaphors*, 1997). Commentary variants were derived experimentally from the *I Ching* -- appropriately known otherwise as *The Book of Changes* -- for sustainable dialogue, vision, conferencing, policy, network, community and lifestyle. Links in the models direct users first to the "policy" variant for any node -- from which they can navigate to other commentary variants.

Interactive 3D mapping exercises with the truncated tesseract resulting from the above interaction with AI			
NB: Interactive <i>zoom and full-screen facilities</i> enable readability of labels			
Experimental node labelling NB: Provisional -- constrained by clutter and readability)		Basic features and potential model enhancements	
Node label contents	Interactive models with alternative labelling	"Tennis-ball" path showing primary and secondary diagonals	Cones framed by secondary diagonals with <i>BaGua</i> encoded disk bases
Basic configuration with hexagram encoding			
	Interactive 3D animation	Interactive 3D animation	Interactive 3D animation
<i>Diatinctive label composition</i>	<i>Accessible interactive 3D animations</i>	<i>Interactive 3D variants currently avoided because of browser/platform instabilities</i>	
id / hex_sym	minimal		
id / hex_sym / strat1	id_strat_medium		
id / hex_sym / eng_label / strat1 / strat2	full_identity		
id / hex_sym / ch_name / strat1 / strat2	id_first_basic		
id / hex_sym / ch_name / strat1 / strat2	id_first_basic2		
id / hex_sym / ch_name / strat1 / strat2	id_strat		
id / hex_sym / ch_name / strat1 / strat2	id_strat_split		
id / logic1 / logic2 / hex_sym / logic3	logic_structured		
id / logic1 / logic2 / logic3	logic_compact		
id / strat_diag / strat1 → strat2	strategic_flow		
strat1 / logic1 → logic3	strat_logic_mix		
logic1 / logic2 / logic3 / id / hex_sym	logic_flow		
strat1 / strat2 / id / hex_sym / ch_name	strat_first_basic		
strat1 / strat2 id / hex_sym / eng_label	id_strat_compact2		
id / hex_sym / chinese / pinyin / eng_label	cultural		
hex_sym / chinese / eng_label / strat1	multi_meaning		

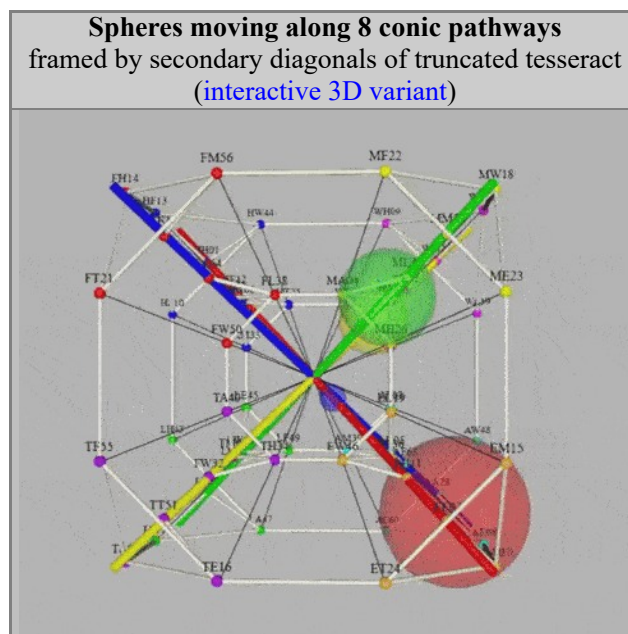
Framing strategic spherical dynamics with a truncated tesseract?

One design metaphor of mnemonic value is that of the familiar seam pattern of the tennis-ball (and baseball), as indicated above, discussed and illustrated separately with variants (*Memorable feedback cycles in 3D mappings of SDG relevance?* 2024). As presented above it is associated with presentation of primary and secondary diagonals of the truncated tesseract. The secondary diagonals form a triangular frame around each primary diagonal -- within which a cone can be placed as indicated above (right).

The merit of such an approach is to simplify visually the geometric complexity of the 64-vertex truncated tesseract into a configuration of 8 interlinked cones -- each clustering 8 vertices for mnemonic purposes. These correspond to the eight "houses" of the *I Ching* arrangement of hexagrams (*System Dynamics, Hypercycles and Psychosocial Self-organization: exploration of Chinese correlative understanding*, 2010). Opposing cones along the same primary diagonal can then be understood as clustering 16 such hexagrams, readily understood as corresponding to a set of 16 connectives, whether logical or otherwise. The configuration can be understood as a dynamic 3D representation of the familiar traditional 2D *BaGua* pattern - hence the contrasting indications on the disks at the base of each cone (above).

Enhancing the mnemonic geometry with a dynamic device, each cone can then be understood as framing the movement of a sphere whose size changes as it traverses the cone -- as illustrated below. The argument here is that the representation by each diagonal of 16 connectives -- logical, emotional, spiritual, or action oriented -- offers both a framing of their particular dynamics and a sense of their connectivity. The sets of labels explored above could be substituted for the labels shown below -- extending the relevance to the strategic articulation associated with the 16 Sustainable Development Goals, as discussed above.

Clearly interaction with such a model suggests many design alternatives and refinements, most obviously with respect to the pattern of colours, labelling of nodes, rate and distance of movements, and their relative timing of movement (even in a rhythm).



Various other modifications to the dynamics of sphere movement within the geometry may be imagined. An earlier exercise explored the possibility of a related 4x6-fold dynamic with a 24-fold articulation along curves (*24-fold Pattern Implied by Dynamics of the Lauburu in 3D*, 2016; *Psycho-social hyperbubbling: beyond one-bubble credibility and despair?* 2017). This gave rise to interactive 3D representations for different "voices" (*24-voice Dynamics framed by Basque Lauburu in 3D*; also 16-voice and 8-voice, Especially intriguing is the dynamic transformation of the length of those edges which link the corner structures such as to simplify the structure as a whole by collapsing explicit distinctions arising from geometrical truncation -- thereby increasing the distinctions implicitly configured by the model.

References

Susantha Goonatilake. *Toward a Global Science: mining civilizational knowledge*. Indiana University Press, 1999

George Lakoff and Rafael Núñez. *Where Mathematics Comes From: how the embodied mind brings mathematics into being*. Basic Books, 2000 [[summary](#)]



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