The Indeterminate Deterministic Universe: A Metaphorical Framework Integrating Block Universe Theory and Quantum Phenomena

Author: Lorenzo Lucchesi (Leghorn, Italy)
lorenzo.lucchesi@libero.it

Abstract

We propose a novel metaphorical framework for interpreting the physical universe by integrating concepts from string theory, quantum mechanics, and the block universe model. Through the allegory of a multidimensional library containing all possible versions of a narrative, we explore how deterministic structures can give rise to apparently indeterminate experiences. This framework suggests that the universe is pre-written but traversed subjectively along quasi-spatial trajectories governed by coherence, continuity, and probabilistic branching. We interpret time as a spatial dimension within this model and examine implications for entropy, black holes, and quantum entanglement.

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1. Introduction

The block universe model posits that past, present, and future events coexist within a four-dimensional spacetime manifold, implying a deterministic universe where the flow of time is an illusion[1]. However, quantum mechanics introduces inherent indeterminacy[2], challenging this deterministic view. Reconciling these perspectives requires a framework that accommodates both deterministic and probabilistic elements.

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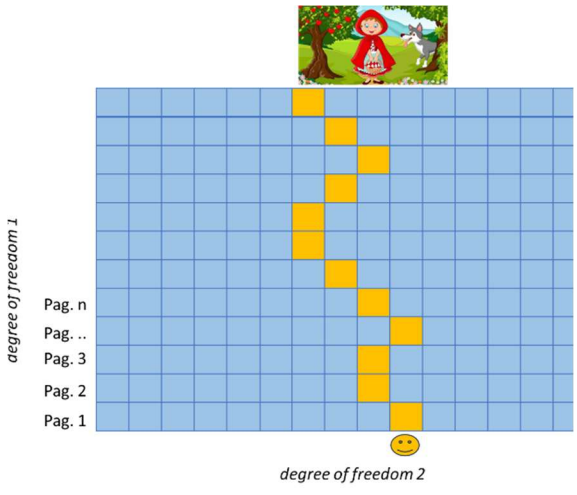
2. The Library as a Block Universe

Imagine an immense library where each "book" is composed by selecting a sequence of individual pages arranged on ascending shelf levels. Every level contains a multitude of unique but closely related page variants. Despite differences, these pages all depict a coherent fragment of a narrative. By assembling pages sequentially, where each chosen page on a given level must be adjacent to the one on the level below, a complete narrative is constructed. This metaphorical construct encapsulates key principles of a deterministic multiverse that allows for subjectively perceived choice and uncertainty. The library represents a block universe an ensemble of all possible narratives (universes) arranged within a pre-defined spatial structure[6]. The levels of shelves correspond to discrete points along the temporal axis, reinterpreted here as a spatial dimension. Each page is a state of the universe; adjacency indicates slight variations consistent with classical continuity.



From this perspective, the "reading" of the book our traversal through levels via adjacent pages constitutes

the experience of time. The block universe is deterministic in that all possible versions of the story exist, but our subjective trajectory through it (our "choices") defines which version we experience.

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3. Temporal Navigation and the Illusion of Choice

Although each book assembled from the library tells a coherent story, the selection process creates the illusion of choice and free will. At each level, multiple adjacent pages are accessible, representing alternate but coherent next steps. The story always feels uncertain in its development mirroring quantum superposition until the next page is chosen.

The key insight is that this "choice" does not generate new realities but rather selects among pre-existing ones. The temporal dimension, traditionally viewed as flowing, is instead a navigational axis through a static, multidimensional structure. Continuity emerges from restrictions imposed on page adjacency, analogous to causality in physics.

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4. Quantum Phenomena as Page Superposition

Before a specific identifying detail is revealed in the book (e.g., a character's cloak color), all possibilities remain valid within the framework of previously selected pages. This mirrors quantum indeterminacy: the character exists in a superposition of all possible states until one is encountered[2].

Critically, the act of "measurement" (i.e., discovering the color) does not collapse a wavefunction in a probabilistic sense. Instead, it merely reveals the consequence of the already-determined path. The equations of quantum physics, then, describe the structure of adjacent universes available from the current state[5]. Entanglement becomes a manifestation of global coherence across the pre-written structure, not an anomalous communication mechanism.

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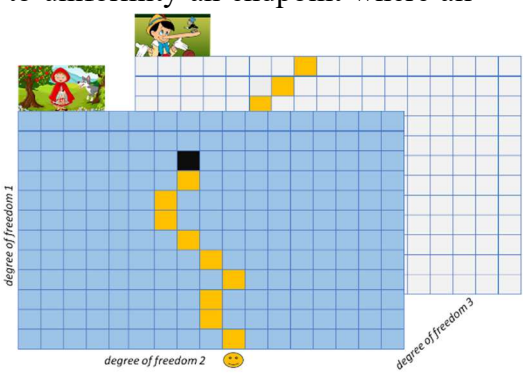
5. Implications and Extensions

5.1 Entropy and the Termination of the Block Universe

The upward ascent through the library's levels may correspond to an increase in entropy. As one ascends, adjacent pages become increasingly similar, eventually converging to uniformity an endpoint where all narratives become indistinguishable. This could provide a conceptual basis for the second law of thermodynamics within the block universe: entropy increases as one moves toward a state of narrative homogeneity[1].



5.2 Black Holes as Multiverse Junctions

Black holes, in this framework, represent transitions not along the vertical or horizontal axes (i.e., within a single narrative library) but through depth into other libraries with different fundamental

structures or physical laws. These portals to alternate block universes may correspond to changes in the "temporal" degree of freedom, allowing transitions across fundamentally different ontologies[3].

5.3 The Construction of the Block Universe

A final speculative consideration involves the directionality of the block universe's construction. If one aims to ensure coherence across all trajectories, constructing the narrative from the endpoint backward (from maximum entropy to origin) offers a more efficient strategy[5]. In this scenario, each path is guaranteed to be coherent, and discontinuities are avoided. This retrocausal view implies a negative velocity along the temporal axis, and raises the intriguing possibility of "reverse reading" the story—suggesting mechanisms for retrocausality or time reversal.

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6. Conclusion

This framework offers a novel lens through which to interpret the apparent tension between quantum indeterminacy and classical determinism. By conceptualizing the universe as a pre-defined, multidimensional structure navigated through coherent, adjacent states, we reinterpret time not as a flowing parameter but as a spatial axis enabling consistent transitions between states. The apparent uncertainty in physical phenomena emerges not from fundamental randomness, but from the limited knowledge of our current position and the adjacent trajectories available to us.

Quantum superposition, entanglement, and the directional flow of entropy can all be understood within this structure as features of an already-written, but subjectively traversed, universal architecture. This reinterpretation removes the need for ontological collapse or non-local communication by positioning each observed outcome as the consequence of a deterministic yet locally unpredictable trajectory through the block universe.

Furthermore, the suggestion that the universe may have been constructed retrocausally from thermodynamic finality toward initial conditions opens the door to intriguing possibilities about the nature of time, causality, and information. While speculative, this model provides a coherent explanatory structure that aligns with both the mathematical formalisms of quantum theory and the geometric intuition of relativistic physics.

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