ITEM #197 — Sequence, Graph, and Image: A Year-End Structural Reflection on DBM (2025)

Why Sequence-Dominant Intelligence Emerges First

Conversation：DBM CCC 与进化范式

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Abstract

This item presents a year-end structural reflection on DBM (Digital Brain Model) development in 2025.
By examining **natural phenomena**, **DBM/AI system composition**, and **engineering application frequency**, we observe a consistent hierarchy:

Sequence-based structures dominate, followed by **Graph-based structures**, and finally **Image / Spatial Starmap structures**.

This ordering is not a matter of preference or convenience, but a consequence of **expressive efficiency, algorithmic feasibility, and evolutionary pressure**.
DBM's trajectory therefore reflects a structurally inevitable evolutionary path rather than an arbitrary design choice.

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1. Sequence Structures in Natural Phenomena

Many fundamental natural and social phenomena are inherently sequence-based:

- DNA as a genetic sequence
- Financial markets as time-series
- Human language as ordered symbol streams

Although the underlying realities may be spatial, networked, or high-dimensional, **only their sequential projections are evolutionarily scalable**.

Sequence is the minimal structure that can be reliably copied, transmitted, and evolved.

This explains its overwhelming prevalence in both nature and civilization.

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2. Sequence Dominance in DBM and AI Systems

From an engineering and application-frequency perspective, sequence-based structures form the majority of operational systems:

- SequenceStarmap
- LLM (Large Language Models)
- ELM (Event Language Model)
- ACLM (Action / Calling Language Model)

This dominance is structural, not ideological:

- alignment is trivial (index-based),
- metric definitions are stable,
- algorithms are tractable,
- interpretation paths are clear.

Sequence structures are therefore the **first class of intelligence systems to form stable engineering loops**.

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3. Why Sequence Structures Are Expressively Efficient

Sequence structures offer a unique balance:

- strong expressive and abstraction power,
- relatively simple topology,

- manageable computational complexity.

They serve as an **optimal compression frontier**, retaining maximal semantic signal under minimal structural cost.

This makes them the preferred substrate for early-stage intelligence systems.

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4. Graph Structures: Greater Power, Greater Cost

Graph-based structures provide richer expressive capacity:

- parallel relations,
- non-linear dependencies,
- multi-hop reasoning.

However, this power comes with substantial challenges:

- graph alignment is inherently difficult,
- metric stability is fragile,
- local changes propagate globally,
- pruning and contribution scoring are complex.

As a result, Graph structures naturally **emerge later**, often as extensions or projections of stable sequence backbones.

Their growth is inevitable, but necessarily gradual.

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5. Image and Spatial Starmap Structures: The Unavoidable Endgame

Image / Spatial Starmap structures represent the most complete form of structural representation:

- continuous spatial relationships,
- high-dimensional locality,
- strong perspective dependence.

They also present the highest difficulty:

- alignment is non-trivial,
- distance metrics are context-sensitive,
- structural stability is hard to guarantee.

These structures are not optional in the long run, but they **cannot be engineered first**.
They must be approached through layered abstractions built atop sequence and graph foundations.

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6. Evolutionary Interpretation

The observed hierarchy reflects an evolutionary necessity:

Structure Type	**Evolutionary Role**
Sequence	Survival and replication
Graph	Relational expansion
Image / Spatial	World reconstruction

This mirrors biological intelligence:

- neural spikes are sequences,
- neural circuits form graphs,
- perception reconstructs space.

DBM follows the same lowest-resistance evolutionary path.

Conclusion

The dominance of sequence-based structures in DBM is not a limitation, but a confirmation of structural correctness.

**DBM does not pursue the most powerful structure first,
but the structure that can survive, scale, and stabilize earliest.**

This restraint is precisely what enables DBM to progress toward more complex forms of intelligence without collapse.

ITEM #197 — Sequence、Graph 与 Image: DBM 2025 的年度结构反思

为何序列型结构必然最先成熟

摘要

本文作为 DBM 2025 年度反思型条目，总结并确认一个清晰的结构事实：

从自然现象、DBM/AI 系统组成、以及工程应用频度来看，
Sequence（序列）类结构占据绝对多数，其次是 Graph（图），最后是 Image / Spatial Starmap（空间图）结构。

这一顺序并非偏好选择，而是由**表达效率、算法可行性与演化压力**共同决定的结构必然性。

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1. 自然现象中的 Sequence 结构

多个关键自然与社会现象以序列形式存在：

- DNA 的遗传序列
- 金融市场的时间序列
- 人类语言的符号序列

尽管其底层现实高度复杂，但：

只有能被线性化的结构，才能被大规模复制、传播与演化。

Sequence 是演化可行性的最低结构形态。

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2. DBM / AI 系统中的 Sequence 主导性

从 DBM 与主流 AI 的结构组成看，Sequence 类系统占据主流：

- SequenceStarmap
- LLM
- ELM
- ACLM

其原因并非理念偏好，而是工程事实：

- 对齐天然
- 度量稳定
- 算法复杂度可控
- 可解释性强

Sequence 是**最早形成完整工程闭环的智能结构类型**。

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3. Sequence 的表达效率优势

Sequence 结构在表达能力与复杂度之间达成了关键平衡：

- 具备良好的抽象与表达能力
- 拓扑结构简单
- 算法与计算成本可控

它是**在最低结构成本下保留最多语义信息的压缩极值点**。

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4. Graph 结构：更强，但更难

Graph 结构拥有更高的表达潜力：

- 并行关系
- 非线性依赖
- 多跳推理

但其工程代价显著：

- 对齐极难
- 度量不稳定
- 局部扰动影响全局
- 剪枝与贡献度评估复杂

因此，Graph 结构只能在 Sequence 稳定之后逐步发育。

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5. Image / Spatial Starmap：终局但最难

Image / Spatial Starmap 试图最大程度保留原始空间关系：

- 连续空间
- 高维局部相关
- 强视角依赖

其难度远超前两类结构。
它不是可选项，而是**无法回避的终局目标**，但只能在坚实的 Sequence 与 Graph 基础上逐步逼近。

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6. 演化视角下的结构路径

这一结构顺序对应清晰的演化路径：

结构类型	演化角色
Sequence	生存与复制
Graph	关系扩展
Image / Spatial	世界重建

这与生物智能的发展过程高度一致。

结论

Sequence 在 DBM 中的主导地位并非局限，而是**结构正确性的体现**。

DBM 并未选择最强的结构，
而是选择了最先能活下来的结构。

正是这种克制，使 DBM 能在不崩溃的前提下，持续迈向更复杂的智能形态。
