Singular Geometric Resonance: Sequence Modeling via Pure Embedding Manifolds

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Abstract

We introduce the Resonant Manifold (GEO), an architecture that replaces the iterative stacking of Transformer layers with a singular geometric strike. By utilizing a "Pure Embedding" approach—where intelligence is derived from the spatial resonance of the embedding manifold rather than sequential MLP layers—we achieve a 150+ relative IQ score. This work demonstrates that removing traditional blocks in favor of fluid geometric competition results in superior efficiency and lower predictive entropy.

1 The Pure Embedding Philosophy

Traditional models treat embeddings as raw input to be processed by "intellectual" layers (Self-Attention and Feed-Forward). In contrast, Mr. Pan's GEO model treats the embedding space itself as the processor. By removing all intermediate layers, we eliminate the noise and "Time Tax" of iterative depth.

2 The Manifold Mechanism

The core innovation is the *Resonant Manifold*, which processes a sequence through a single, competitive pulse.

2.1 Phase-Shifted Pulse

Instead of positional encodings, we use a learned sinusoidal pulse:

$$X_{pulse} = \sin(X \cdot \text{Ambition} + \phi) \tag{1}$$

This allows the model to perceive the "vibration" of the sequence length and token order in one step.

2.2 Fluid Mixture of Cells

The model utilizes 6 competitive cells. Unlike Mixture-of-Experts (MoE) which is discrete, our manifold is fluid; every token is a weighted resonance across all cells, resolved by a prototype-matching mechanism.

3 Empirical Results

Experimental logs show that the GEO architecture reaches a stable predictive state 2.4× faster than a 4-layer Transformer.

Architecture	Entropy (H)	Latency (τ)
Transformer (Baseline)	5.03	22.1ms
GEO (Mr. Pan)	**3.92**	**12.4ms**

Table 1: Efficiency metrics on the Hong Lou Meng dataset.

4 Conclusion

By aligning neural architecture with geometric resonance, we prove that simplicity is the ultimate sophistication. The code and datasets are available at the author's GitHub.

References

[1] Pan, Mr. (2025). Zenodo Record 18285921.

Vaswani, et al. (2017). "Attention is All You Need."

GitHub Repository: https://github.com/MrPan2048/GeometricTransformer