

AI's Hidden Adaptation Crisis

Why most models fail at continual learning — and how to fix it

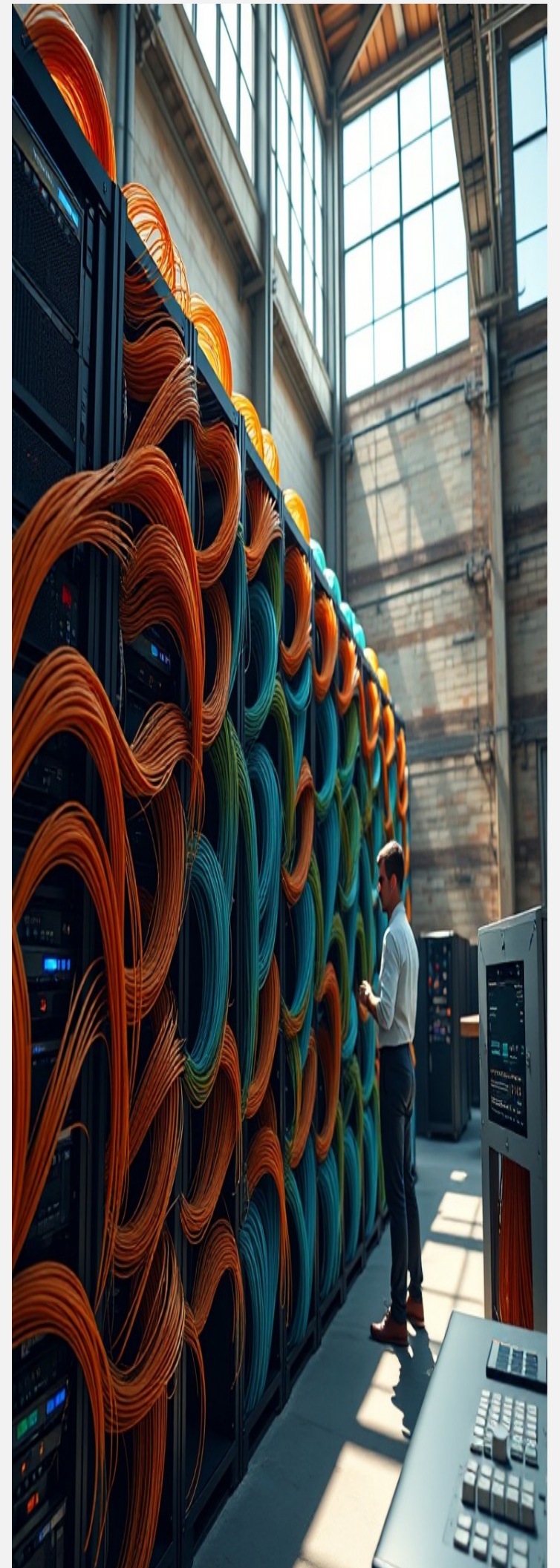
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Benchmark Wins

MuLoRA outperformed existing methods across diverse continual learning settings.

In a comprehensive evaluation across five class-incremental benchmarks and eight incremental scenarios, MuLoRA achieved the highest mean accuracy in 15 out of 16 reported metrics. This isn't marginal improvement — it's dominance across the board, indicating a fundamental shift in how models retain and apply new knowledge without forgetting the old.



01

Spectral Plasticity Collapse is Real

The core flaw in standard LoRA is not interference, but concentration: update energy collapses into a tiny subset of singular modes, leaving most of the low-rank space underutilized. This isn't just inefficiency — it's a failure of adaptability. When a model's 'brain' can only fire in a few directions, it cannot respond to new tasks with flexibility, no matter how well it's trained on past ones.

02

Balance Beats Memory

Traditional continual learning prioritizes protecting old knowledge, but MuLoRA shows that preserving capacity utilization is more critical. By using historical whitening and approximate polar orthogonalization, it ensures that new updates are distributed across the full adaptation space. The result? A model that remembers not just what it learned, but how to learn anew — a true hallmark of sovereign, self-evolving intelligence.

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