Executive Summary

Kimi K2: A Breakthrough in Open Agentic Intelligence

The Problem

Large language models face fundamental limitations in achieving true agentic intelligence - the ability to autonomously perceive, plan, reason, and act in complex environments. Current models struggle with training instability, inefficient token usage, and difficulty scaling agentic capabilities like multi-step reasoning and tool use beyond their training data.

The Breakthrough

Kimi K2 introduces a revolutionary **MuonClip optimizer** that eliminates training instability while preserving the token efficiency advantages of the Muon algorithm. Combined with a large-scale agentic data synthesis pipeline and joint reinforcement learning framework, this enables stable training of a 1 trillion parameter model that achieves state-of-the-art performance in agentic tasks without requiring extended thinking time.

How It Works

The core innovation addresses attention mechanism instability through **QK-Clip**, which constrains attention logits by rescaling query and key projection weights when they exceed threshold values. This prevents the exploding attention logits that typically cause training failures in large-scale models. The system also generates synthetic agentic trajectories at scale through simulated environments, then refines capabilities through reinforcement learning with both verifiable rewards and self-critique mechanisms. This approach achieved **zero loss spikes** during pre-training on 15.5 trillion tokens.

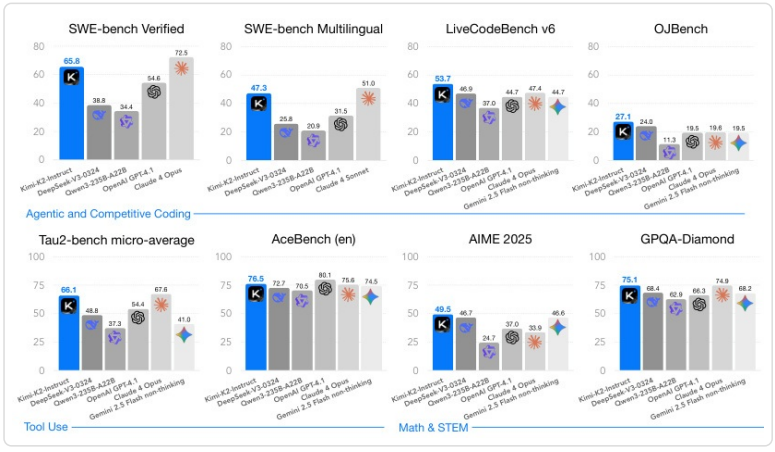
Why This Matters

Kimi K2 represents a significant leap toward practical AI agents that can operate autonomously in real-world scenarios. Its exceptional performance on software engineering tasks (65.8% on SWE-Bench Verified) and

competitive coding (53.7% on LiveCodeBench) demonstrates unprecedented capabilities for AI systems that can write, debug, and deploy software automatically. The model's strength in mathematics (49.5% on AIME 2025) and reasoning (75.1% on GPQA-Diamond) shows broad applicability beyond coding.

The Business Opportunity

This technology enables the development of autonomous AI agents for software development, scientific research, and complex problem-solving at scale. With open-source release of both base and post-trained models, Kimi K2 democratizes access to cutting-edge agentic intelligence, allowing companies to build specialized AI agents that can operate independently across diverse domains from customer service to research automation.



Main results showing Kimi K2 performance across benchmarks