

Agentic World Modeling: 42 Researchers Map 400+ Papers into a Unified Taxonomy

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**Agentic World Modeling:
400+ Papers in One
Unified Taxonomy**

Levels x Laws: a cross-domain framework for AI world models

- 400+**
Papers synthesized into a single framework
- 3 x 4**
Capability levels crossed with governing-law regimes
- 100+**
Representative systems mapped across domains

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A 42-author team published [Agentic World Modeling](#), a survey synthesizing over 400 papers into a single framework for understanding how AI agents model their environments. The paper introduces a “Levels × Laws” taxonomy on two axes. Three capability levels: L1 Predictor (learns one-step transitions), L2 Simulator (composes multi-step, action-conditioned rollouts that respect domain constraints), and L3 Evolver (autonomously revises its own model when

predictions contradict new evidence). Four governing-law regimes: physical (robotics, autonomous driving), digital (code execution, web navigation), social (multi-agent coordination, beliefs and norms), and scientific (hypothesis-driven experimentation, drug discovery). The survey maps 100+ representative systems into this 3×4 grid, spanning model-based reinforcement learning, video generation, web agents, social simulation, and autonomous scientific discovery.

Researchers building AI agents currently pull from at least five disconnected communities: robotics, game AI, web automation, social simulation, and scientific discovery. Each uses incompatible definitions of “world model.” This taxonomy gives them a shared coordinate system. If you’re building a web agent, you now know you need L2 capability under digital laws, and you can look at what physical-world systems already solved for similar constraints. The cross-domain mapping also reveals which cells are well-explored (L1 physical) and which are nearly empty (L3 social), pointing where new research should go. For related work on how world models handle consistency, see [WildWorld](#).

The framing suggests capable AI agents won’t rely on a single model. They’ll need a layered stack: reactive prediction for moment-to-moment control, simulation for planning, and self-revision when the environment shifts beneath them.

Sources:

- [Agentic World Modeling \(arXiv\)](#)
- [DreamerV3: Mastering Diverse Control Tasks \(Nature 2025\)](#)
- [Generative Agents: Interactive Simulacra \(Park et al. 2023\)](#)
- [LeCun: A Path Towards Autonomous Machine Intelligence](#)

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