

Early Concepts of Self-Improving Machines

(1790s-1960s)

- Least-squares Adaptation
- Gödel's Arithmetization
- Intelligence Explosion

Symbolism & Heuristic Self- Modification

(1960s-1980s)

- Self-reproducing automata
- Lenat's AM & EURISKO
- Heuristic Rule Revision

Connectionism & the Emergence of Meta-Learning

(1980s-2000s)

- Learning to Learn
- Self-referential learning
- AIXI & Gödel Machine

Formal & Architecture-Level Self-Improvement

(2000s-2020s)

- Neural Architecture Search
- Self-play
- Reinforcement learning

Foundation Models & Agentic Systems

(2020s–Present)

- Reasoning & Acting
- RLAIIF & RLVR
- Open-ended Evolution

Late 1790s

Theoretical Roots & Ideal Models

Present