The Evolving Stack of Generative AI

Taxonomy, techniques, and challenges in the 2025 landscape of generative AI systems

Generative AI

Overview of rapidly evolving systems and their transformative capabilities since 2022.

Survey importance

Surveys play a crucial role in tracking and understanding the fast-paced developments in generative AI, providing researchers and practitioners with comprehensive knowledge of the field.

Key developments

Since 2022, generative AI has undergone transformative changes with the emergence of large language models, multimodal systems, and increased accessibility to developers and end-users.

AI systems and capabilities

Generative AI systems are defined by their ability to create new content across various domains, demonstrating unprecedented capabilities in text, image, and code generation.

The seven pillars of generative AI

Foundation models as cornerstone of modern AI systems, with prompting techniques, agent architectures, and evaluation methodologies.

Advanced prompting

Techniques for improved reasoning through structured thought approaches.

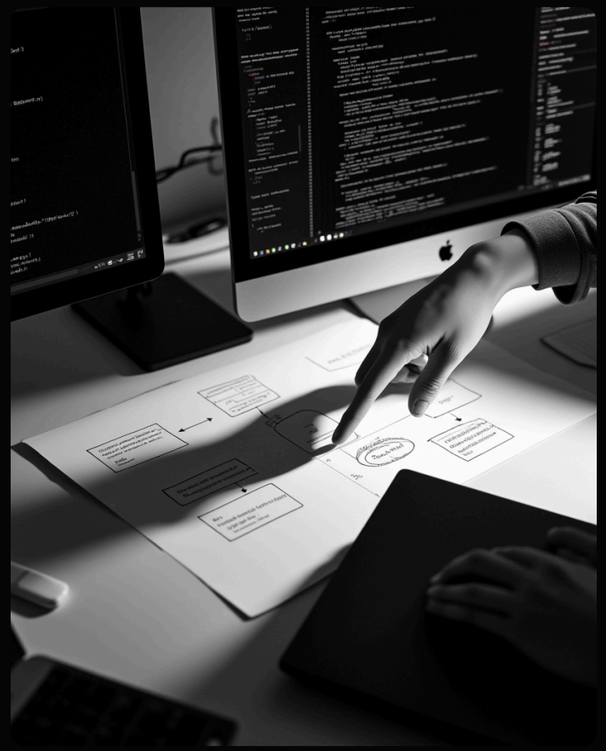
ReAct methods combine reasoning with actions

Graph-of-Thought represents interconnected reasoning pathways

CoT and ToT enable step-by-step reasoning

Architecture

Agent architectures in modern AI systems



Multi-agent systems

Multi-agent system designs enable collaboration patterns between different specialized agents. This approach allows for more complex problem-solving capabilities and distributed intelligence across the system.

Core components

Modern AI agent architectures rely on five core components: Planner, Reasoner, Tool Caller, Memory, and Executor. These elements work together to create intelligent systems capable of autonomous operation.

Deployment considerations

Implementing agent-based systems requires careful attention to deployment considerations. These include infrastructure requirements, scalability planning, and integration strategies with existing technological ecosystems.