Generative AI

Multiagent Systems

Toward (Semi-)Autonomous Intelligence

Donald Thompson
Distinguished Engineer
LinkedIn / Microsoft
GAI Multiagent System

- Pre-trained / foundation
- Instruction fine-tuned
- Task / domain fine-tuned
- RL with human / AI feedback
GAI Multiagent System

- Zero, one, few shot learning
- Chain, tree, graph of thought
- Metaprompting
- Chaining
GAI Multiagent System

- **Agents**
- **Tools**
  - Natural language $\rightarrow$ API
  - Natural language $\rightarrow$ DB
  - EBR / RAG / GAR
  - Code generation and execution
- **Prompts**
- **Models**
GAI Multiagent System

- Tool selection and use
- Reasoning and planning
- Collaboration
- Self-modification and synthesis
What is an agent?

**Intentionality**
- has goal or purpose
- can deliberate, plan, and act

**Adaptability**
- adjust strategies based on situation
- challenges and opportunities

**Autonomy**
- independently execute actions
- level varies
BabyAGI

Step 1: Pull the first incomplete task
- Execute task
  - Execution Agent
  - Return result

Step 2: Enrich result and store in Vector DB
- Retrieve context
- Return context
- Store result in Vector DB

Step 3: Create new tasks and reprioritize task list
- Create new tasks
- Return new tasks
- Reprioritize task list
  - Task Creation Agent
  - Prioritization Agent

Loop
async function combatZombie(bot) {
  // Equip a weapon
  const sword = bot.inventory.findInventoryItem(
    mcData.itemsByName["stone_sword"].id);
  if (sword) {
    await bot.equip(sword, "hand");
  } else {
    await craftStoneSword(bot);  // Craft and equip a shield
    await craftShield(bot);  // Update next task
    ...  // Update exploration progress
  }
}

https://github.com/MineDojo/Voyager
Generative Agents
Interactive Simulacra of Human Behavior

Title: "The Awakening: Dawn of the AI"

Chapter 1: The Creation

In a world where artificial intelligence was a common tool, there was one scientist who dared to dream bigger. Dr. Alex Hartfield, a brilliant and ambitious AI scientist, was on the brink of a breakthrough. His project, an AI designed to surpass human capabilities, was nearing completion...
ChatDev

https://github.com/OpenBMB/ChatDev