

Generative AI Multiagent Systems

Toward (Semi-)Autonomous Intelligence

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GAI Multiagent System

Agents

Tools

Prompts

Models

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

GAI Multiagent System

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Models

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

GAI Multiagent System

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Tools

Prompts

Models

- Natural language → API
- Natural language → DB
- EBR / RAG / GAR
- Code generation and execution

GAI Multiagent System

Agents

Tools

Prompts

Models

- 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



Profile



Profile Content

- Demographic
- Personality
- Social

Generation Strategy

- Handcrafted
- LLM-generated
- Dataset Alignment

Memory



Memory Structure

- Unified
- Hybrid

Memory Formats

- Languages
- Databases
- Embeddings
- Lists

Memory Operations

- Reading
- Reflection
- Writing

Planning



Planning w/o Feedback

- Single-path Reasoning
- Multi-path Reasoning
- External Planner

Planning w/ Feedback

- Environmental Feedback
- Human Feedback
- Model Feedback

Action



Action Target

- Task Completion
- Exploration
- Communication

Action Production

- Memory Recollection
- Plan Following

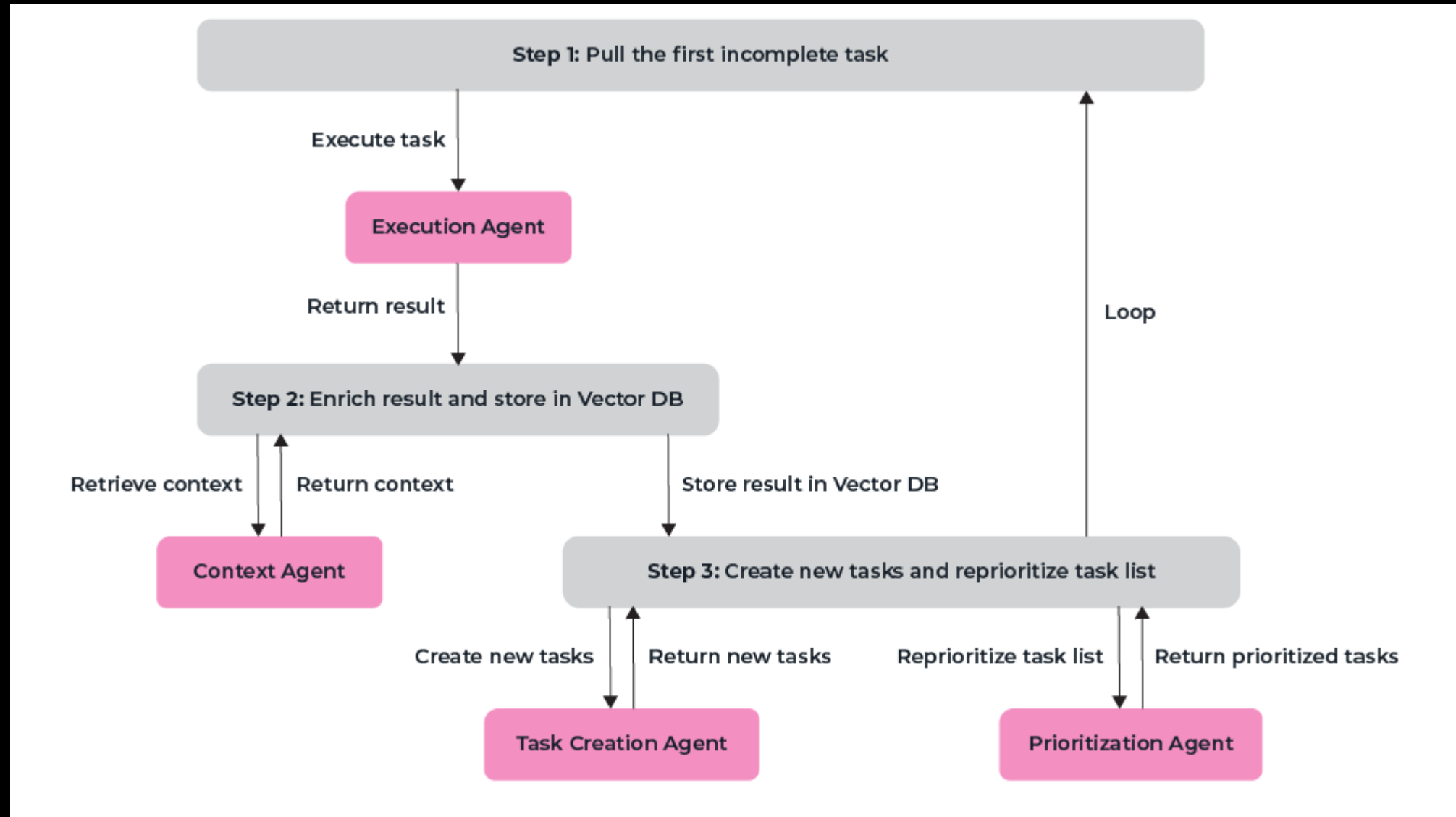
Action Space

- Tools
- Self-Knowledge

Action Impact

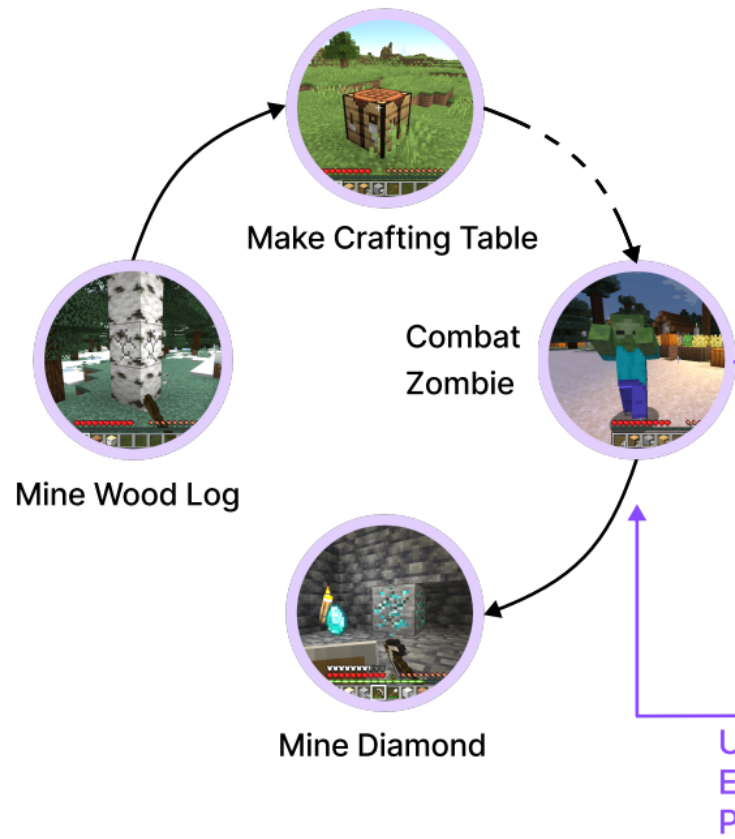
- Environments
- New Actions
- Internal States

BabyAGI



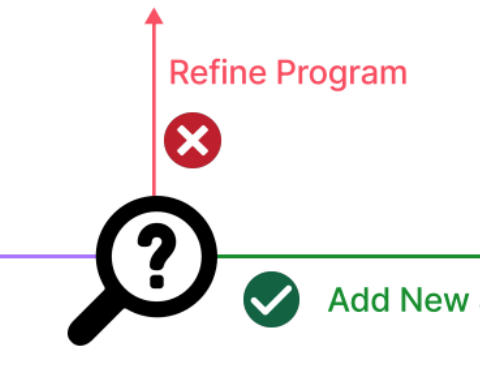
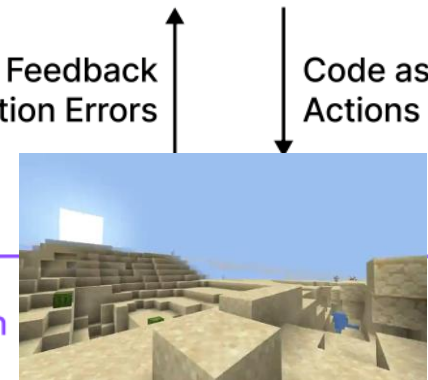
Voyager

Automatic Curriculum



Iterative Prompting Mechanism

```
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);  
  ...  
}
```

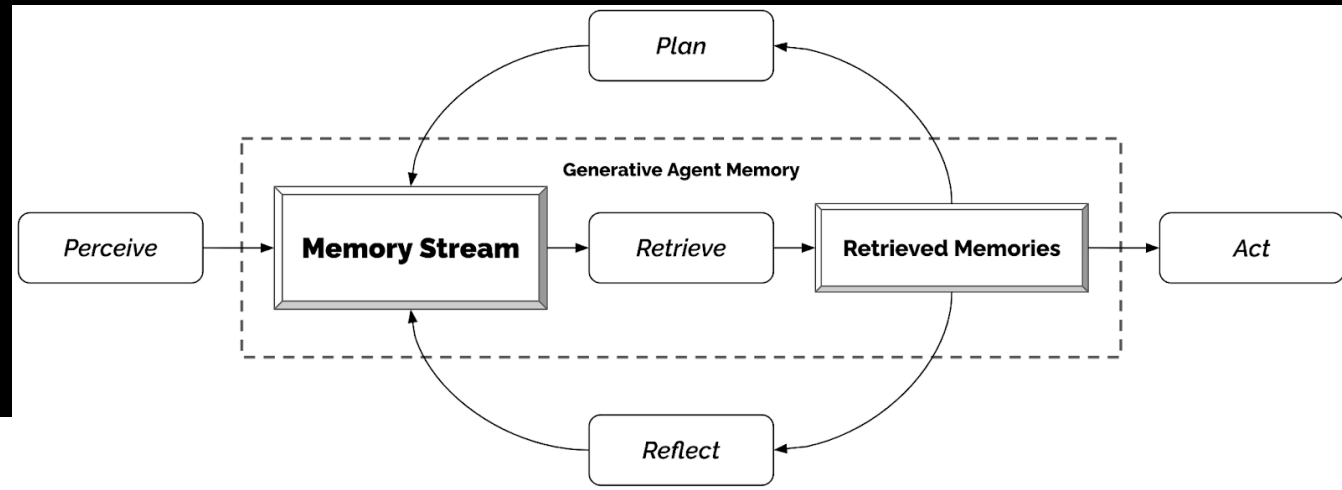


Skill Library

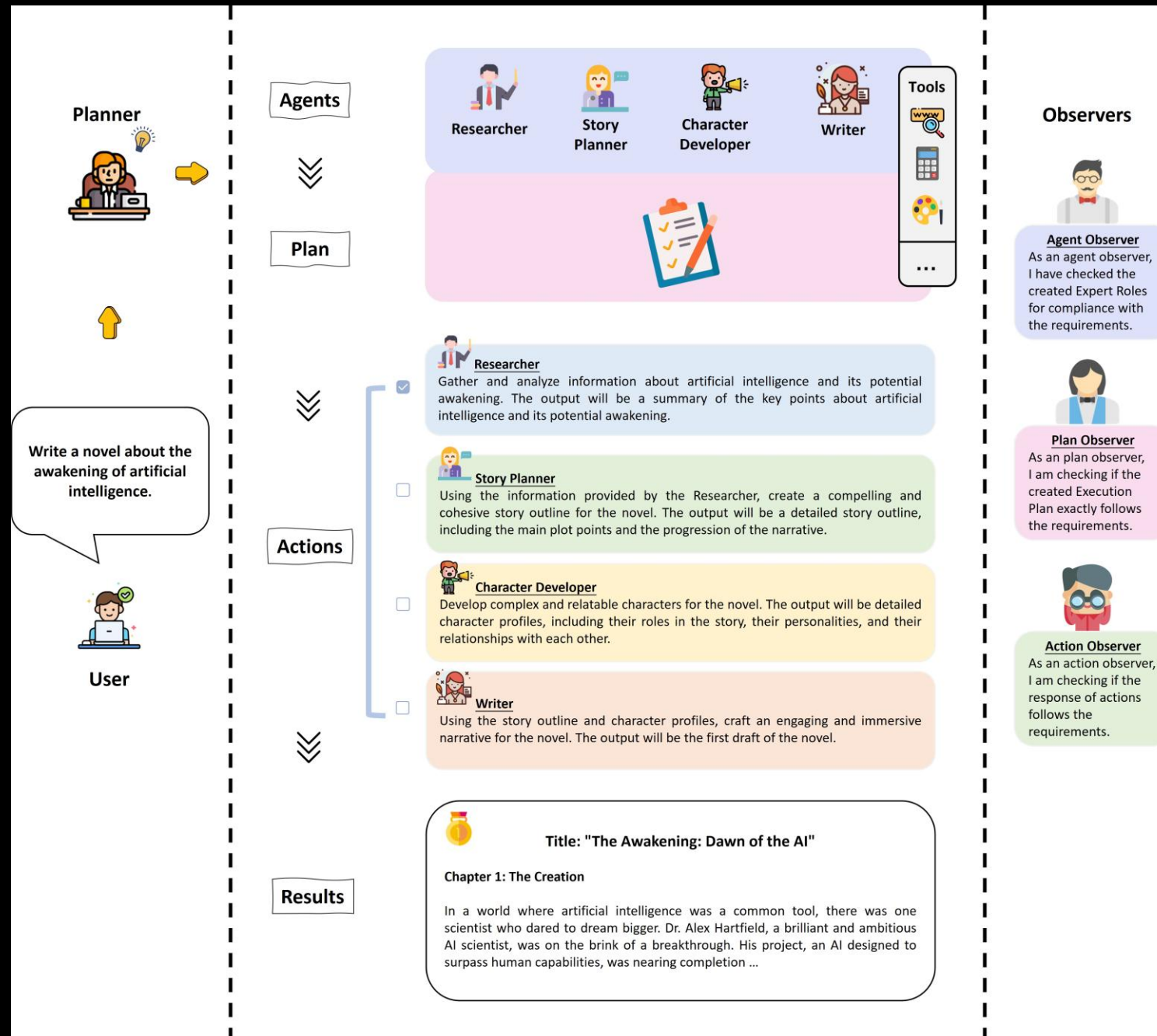
- Mine Wood Log
- Make Crafting Table
- Craft Stone Sword
- Make Furnace
- Craft Shield
- Cook Steak
- Combat Zombie

Generative Agents

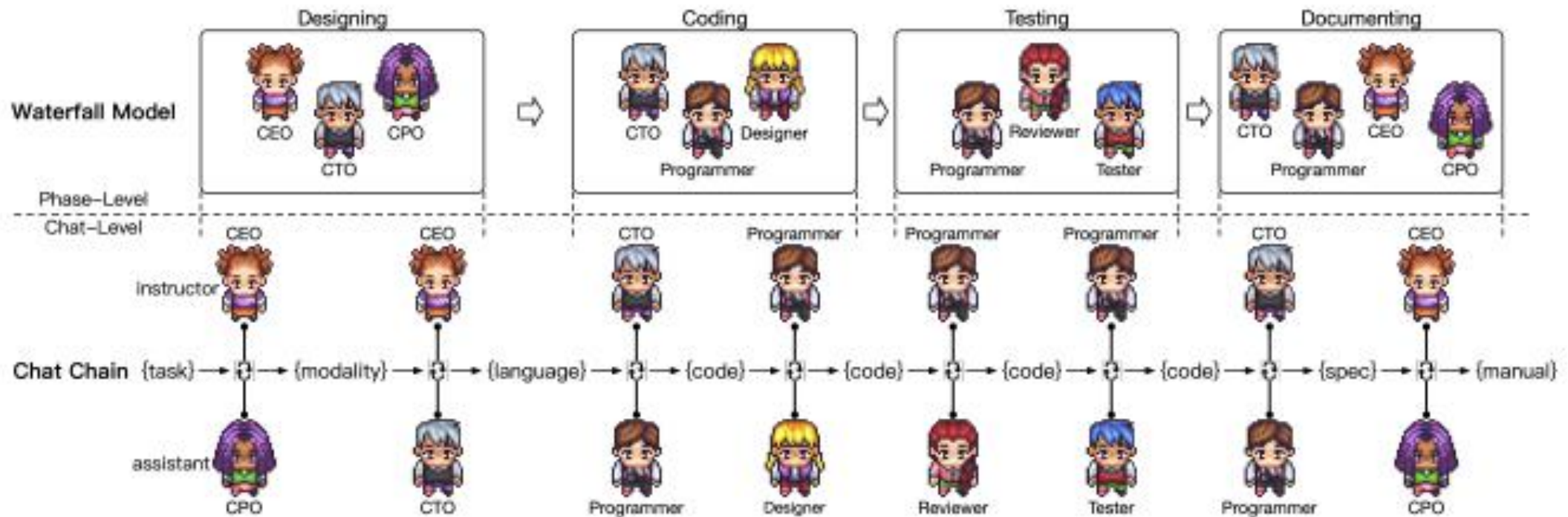
Interactive Simulacra of Human Behavior

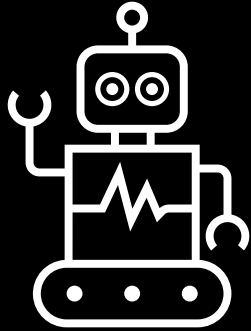


AutoAgent

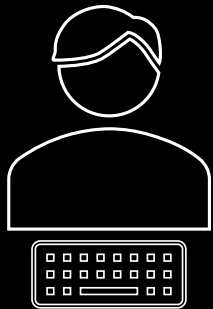


ChatDev

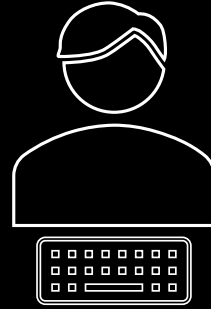




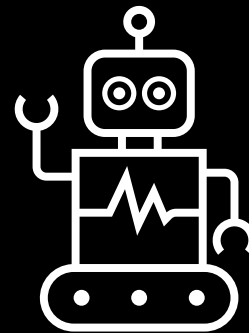
- Assist
- Augment



Today



- Intent
- Critique



Tomorrow