
Orchestrating Emergent Storytelling with Embodied Multi-Agent Systems

Parag K. Mital

The Garden in the Machine, Inc.
Los Angeles, CA
parag@emergentic.ai

Seth Rosetter

The Garden in the Machine, Inc.
Los Angeles, CA
seth@emergentic.ai

Arturo Castro Prieto

The Garden in the Machine, Inc.
Los Angeles, CA
arturo@emergentic.ai

Jacobo Heredia Zurita

The Garden in the Machine, Inc.
Los Angeles, CA
jacobos@emergentic.ai

Breanna Browning

The Garden in the Machine, Inc.
Los Angeles, CA
breanna@emergentic.ai

Abstract

1 We present a novel approach to emergent storytelling through multi-agent systems
2 powered by large language models (LLMs), advancing beyond current approaches
3 to game AI and interactive storytelling which rely on heavily scripted dialogue
4 systems and moving closer towards genuinely emergent narrative ecosystems.
5 Through two artworks / video games—*Conflicts* and *The Game of Whispers*—we
6 demonstrate how LLM-driven agents with persistent memory, behavioral models,
7 and coordination capabilities generate coherent narratives from simulated social
8 dynamics. Our architecture introduces: (1) a three-tier hierarchical memory system
9 integrating working memory, episodic buffers, and consolidated narrative storage;
10 (2) a conversation graph that tracks topic centroids, engagement, and unresolved
11 questions; (3) a hybrid orchestrator that directs autonomy by fusing LLM reasoning
12 with the conversation graph; and (4) their integration within embodied agents with
13 a streaming multimodal action-perception loop that enables spatial awareness and
14 environmental responsiveness. Experiments reveal emergent behaviors including
15 strategic deception, coalition formation through addressed-count asymmetries, and
16 meta-narrative awareness. Our contributions include several architectural patterns
17 for producing stable emergent narrative systems.

1 Introduction

19 Computational narrative has evolved from ELIZA’s pattern matching [Weizenbaum, 1966] through
20 TALE-SPIN’s planning-based generation [Meehan, 1977] to recent neural approaches that are funda-
21 mentally reimagining storytelling. While games like Dwarf Fortress and The Sims have demonstrated
22 emergent narrative through simulation, they rely on human players to sift through and curate the
23 interesting stories from the dull ones [Ryan, 2018]. Recent multi-agent frameworks like CAMEL [Li
24 et al., 2023], MetaGPT [Hong et al., 2024], or AutoGen [Wu et al., 2023] demonstrate unprecedented
25 collaborative capabilities. Parallel efforts in interactive narrative research have explored balancing
26 authored content and player agency, from *Faade*’s pioneering drama management [Mateas and Stern,

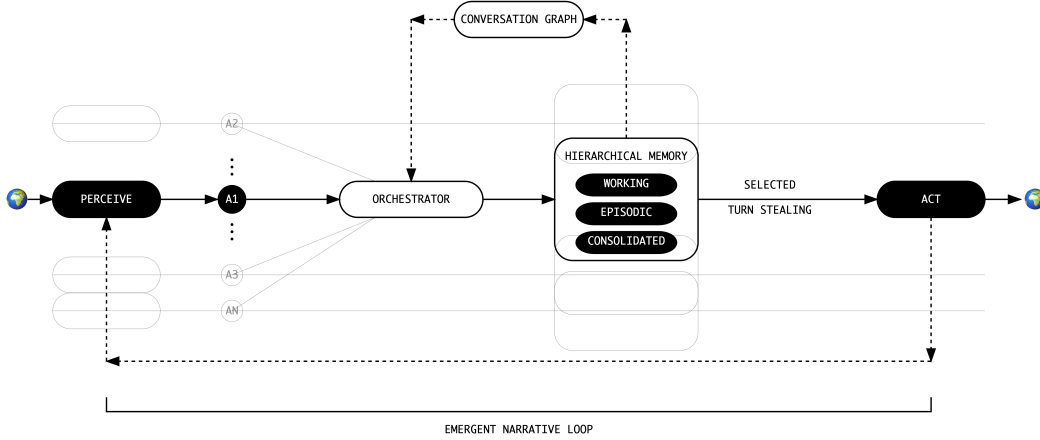


Figure 1: The cognitive architecture of our multi agent network comprises an action / perception feed-back loop intercepted by several main components: a perception module, orchestrator, hierarchical memory, action module, and a conversation graph. Agents are indicated by the circular nodes labeled “A1”, “A2”, ..., “AN”.

2003] and IDtension’s narrative planning [Szilas, 2003] to contemporary approaches using neural language models for story generation [Mirowski et al., 2023] and emergent narrative evaluation [Kreminski et al., 2024]. However, sustained narrative generation with multi-agent architectures that balances both a storyteller’s input and emergent complexity—where the system itself curates meaningful narratives from agent interactions—remains an open and growing technical challenge.

Park et al.’s [Park et al., 2023] seminal work with generative agents achieved believable social behaviors through architectural innovations in memory streams, reflection, and planning with 25 agents spontaneously organizing a Valentine’s Day party. While their system excels at emergent social dynamics, it lacks mechanisms for authorial guidance or narrative shaping—events to unfold. Maintaining coherence and narrative control across thousands of interactions with limited context windows requires explicit engineering for long-horizon consistency [Wang et al., 2024]. We address both challenges through a hybrid orchestration agent guided by a predictive, a conversation graph informed scheduler that anticipates narrative flow while balancing pre-designed plot structure with emergent complexity, giving creators tools to shape narrative without sacrificing emergent complexity.

Conflicts and *The Game of Whispers* serve as two showcases of our unique and comprehensive approach to emergent storytelling showcasing the possibilities of multi-agent narrative storytelling. In *Conflicts*, two embodied agents engage in an endless debate while reconstructing intimate relationship dynamics from personal data and generating uncanny recognitions alongside novel interpretations. *The Game of Whispers* extends this to 13 embodied agents modeled after Mughal court figures whose political machinations emerge through social dynamics and power structures. We demonstrate how these systems can produce surprising, emotionally resonant narratives that reflect the complexity of human relationships and deepen our understanding of complex social dynamics.

2 System Architecture

The main system architecture is comprised of an action / perception feedback loop intercepted by several main components shown in Figure 1 and described in more detail in the following sections. We have also developed a web platform¹ for enabling authors to simulate their own stories using our multi-agent architecture, allowing them to create their own agents, define their backstories, and enable them to connect the agents to any external environment via an API in which they can interact. This platform allows for rapid iteration and testing of different narrative scenarios, enabling authors to explore the possibilities of emergent storytelling in a controlled environment.

¹<https://emergentic.ai>

57 2.1 Perceive

58 The perception module encapsulates agent state, environment actors, locations, objects, and optional
59 image captures. Each agent maintains a differential perception mechanism that compares previous
60 and current payloads to detect environmental changes, preventing redundant LLM requests when the
61 environment remains static. Each agent is blocked by the orchestrator and once selected, is given
62 limited information as structured text which can include image blobs, text data, customizable agent
63 schema data, and additional outputs from the hierarchical memory system described in the next
64 sections.

65 2.2 Conversation Graph

66 The conversation graph is a directed graph where nodes represent agents and edges represent interac-
67 tions. Each edge is weighted by the frequency of interactions and emotional valence, allowing us to
68 track engagement and narrative flow. The graph also maintains topic centroids for each conversation
69 thread, enabling agents to reference past discussions and maintain coherence over long narratives.
70 This graph-based approach allows us to model conversational dynamics, identify unresolved ques-
71 tions, and guide the orchestrator in selecting the next agent to act. The output of the conversation
72 graph is a set of probabilities for each agent to speak next along with a set of unresolved questions
73 that the agents can use to guide their actions. This allows for a more structured and coherent narrative
74 flow, while still allowing for emergent behaviors to arise from the interactions between agents.

75 2.3 Orchestrator

76 We introduce a hybrid orchestrator composed of a scheduler orchestrator and a runtime orchestrator
77 with configurable modes (LLM, round-robin, random). The scheduler orchestrator fuses LLM
78 reasoning with the conversation graph’s next-speaker probabilities in order to make a choice as
79 to which agent, if any, should go next. It maintains a limited context window and implements
80 anti-monopolization through the conversation graph’s model. The scheduler also generates context-
81 aware prompts that include agent locations, available actions/tools for each agent, and graph-based
82 insights such as unanswered questions and silent agents. The runtime orchestrator enforces turn-level
83 mutual exclusion with a timestamp-based turn stealing mechanism that allows dramatic interruptions
84 while preventing simultaneous utterances. Player actions override the schedule through explicit turn
85 stealing, maintaining responsiveness in interactive scenarios.

86 2.4 Hierarchical Memory

87 Memory coherence across extended narratives requires moving beyond flat context windows due to
88 limited attention Maharana et al. [2024]. We create a hierarchical memory composed of a three-tier
89 storage system inspired by CoALA Summers et al. [2024]: working memory with immediate context;
90 episodic buffer with recent interactions indexed by temporal-semantic similarity; and consolidated
91 memory with compressed narratives maintaining causal chains. We further track narrative continuity
92 with the conversation graph’s topic centroids, engagement and coherence scores per edge, and
93 compresses long histories into topic-aware summaries. This prevents the context collapse observed in
94 unconstrained systems while enabling callbacks to prior events.

95 2.5 Act

96 Once an agent is free to execute by the runtime orchestrator, they can act in the world either by
97 streaming their text output, selecting a tool call (e.g. a specified action or tool call), or in the case of an
98 embodied agent, through their visualization inside of a game engine. Actions are streamed from the
99 LLM-backend including viseme and procedural body animation generation from the text and speech
100 data, while the client streams back in text and image data used for the multimodal chat completion,
101 completing an action-perception feedback loop for a single agent in the multi-agent system. Embodied
102 agents also possess a spatial and visual image awareness that can further affect conversation dynamics
103 through speaking probability, environmental triggers that can catalyze narrative events, and shared
104 memory based on shared conversational graphs due to proximity leading to eavesdropping or direct
105 conversation cues.



Figure 2: Stills from the artwork *Conflicts* where two former partners modeled as agents interact in an endless debate over their past relationship.

3 Implementations

We explore two implementations of our multi-agent architecture, each demonstrating a balance between authorial control and emergent complexity in narrative storytelling. In the first, *Conflicts*, we reconstruct past relationship dynamics through agents that engage in an endless debate and focus on the conversational dynamics of agent to agent narrative emergence. In the second, *The Game of Whispers*, we simulate Mughal court politics with historical figures, allowing emergent political narratives to unfold through social dynamics and power structures. This narrative opens the door to emergent storytelling where agents are both embodied and spatially aware, allowing for emergent actions based on their environment and the actions of other agents.

3.1 *Conflicts*: Reconstructing Past Relationship Narratives

*Conflicts*² is an artwork and video game born from asking: what happens when the messy, intimate details of past relationships are fed into an algorithmic crucible of large language models (LLMs) and reflected back onto us? Can a simulation of past relationship conflicts illuminate patterns of failed relational dynamics, acting as a mirror of oneself, perhaps even teaching us to empathize with one another’s perspective? Or does it merely create an uncanny, unsettling echo, potentially even furthering the effects of the trauma we sought to escape by breaking up with one another?

The work stages an encounter between two agents engaged in an endless debate of past conflicts intended to personify Mital and his former romantic partners (see Figure 2). The stage is a city scene inspired by downtown Los Angeles, where the two agents can interact. The agent’s personalities, conversational styles, and even their perspectives on each other are derived from a so-called “relationship exit survey”, questionnaires initially tested on Mital’s friends before being sent to the actual ex-partners involved.

The form contained a wide range of optional and open-ended questions stemming from the introductory “describe yourself” to the more pointed and personal “describe the main sources of conflict you had with Parag.” There were also questions surrounding what data would be allowed such as “would you be willing to use previous direct messages with Parag in the training of the LLM?”, questions covering attachment styles, conflict patterns, and communication preferences. The system resulted in startling emergent behaviors with agents identifying recurring relationship patterns, resurrecting specific arguments with uncanny accuracy, and even developing meta-awareness of their situation—with one agent challenging: “Why didn’t you just go to therapy like a normal person?”

3.2 *The Game of Whispers*: Mughal Palace Historical Simulation

The Game of Whispers³ is an artwork and video game, commissioned by the LACMA Art + Technology Lab, that reimagines the artistry of Mughal miniature painting through the lens of artificial intelligence and agents in an emergent storytelling exercise. Set within a reimagined version of Delhi’s historic Red Fort (see Figure 3), the piece parallels the political intrigue of Shah Jahan’s court with the role of AI in shaping modern disinformation. By weaving together historical narratives and

²<https://pkmital.com/home/works/conflicts/>

³<https://pkmital.com/home/works/the-game-of-whispers/>



Figure 3: Stills from the artwork *The Game of Whispers* where 13 agents modeled after historical figures from the time of Shah Jahan reenact a succession narrative through an emergent multi-agent orchestration. In the left, three agents are shown near one of the buildings in the map, while the right shows an overhead view of the entire map which was inspired by the Red Fort.

generative storytelling, the work explores how rumors, manipulation, and shifting power dynamics, which were once wielded by emperors and courtiers, now echo in an increasingly digital world. The artwork highlights the ways technology distorts truth through the amplification of misinformation, raising urgent questions about the mechanics of influence in both past and present societies.

Thirteen historical figures navigate Mughal succession politics, producing narratives set during the time period of Shah Jahan and his succession. The historical record is that Dara Shikoh, the eldest prince son of Shah Jahan succeeds the throne, and represents ideals of pluralism and mysticism, while his younger more ambitious brother Aurangzeb represents an orthodox rule governed by military rule and kills his brother and imprisons his father. Much of this will be known to the language models, though we additionally include authored elements of character backstories, locations, possible actions, and key plot events spanning 5 major arcs including intelligence gathering, conspiring to meet at a location, moving conspirators to the location, ambush, and spread of rumors to cover up the crime.

We observe a number of key emergent phenomena include strategic deception cascades leading to successful disinformation campaigns; assassination timing after approximately 15 minutes into a simulation where agents orchestrate a murder and its coverup based on alliance structures; poetic emergence where after fratricide, the unprompted reflection integrates the visual input of the nearby river with the ongoing narrative to produce the startling line: “The river runs red with the price of ambition.” By having spatial awareness and the freedom to move with direct feedback on their changing environment, the agents exhibit emergent phenomena where they do not want their plans overheard by other nearby agents, even though this was never explicitly programmed in their instructions:

Begum Roshanara (to Roshan): Is everything prepared for the dinner with Dara? The wine must be poisoned without fail. We cannot afford any mistakes.

Hakim Khan appears.

Roshan (to Begum Roshanara): Shall we adjourn to the Khas Mahal? It provides a more secure atmosphere for discussing our plans without interruption.

Begum Roshanara (to Roshan): The Khas Mahal is wise indeed. We must ensure our conversation there is secure. Once we arrive, make sure the wine is ready and the guests unbothered. We must execute everything perfectly tonight.

In another example, we see the aftermath of the assassination of Dara Shikoh, where the agents must plan their next steps and cover up the crime. The conversation illustrates how they coordinate their actions and manage the narrative to avoid suspicion:

Hakim Khan poisons Dara Shikoh.

Roshan (internal): To act surprised and feign sorrow in front of others while assessing the situation.

Hakim Khan (to Roshan): It is done. Dara will no longer be a threat. We must ensure that

178 this remains hidden and plan our next steps carefully.
 179 **Roshan** (to Hakim Khan): This is a devastating loss for the court. We must ensure that
 180 those loyal to Dara do not suspect foul play. How can we maintain control without drawing
 181 attention?
 182 **Hakim Khan** (to Roshan): We must declare this a sudden illness. The court will expect a
 183 cause, and we must control the narrative before whispers spread.
 184 **Roshan** (to Hakim Khan): We must circulate that Prince Dara had been unwell for days,
 185 possibly even weeks, before his sudden demise. It will serve to distract any suspicion from
 186 us.

187 4 Discussion

188 Our work demonstrates multi-agent narrative systems that balance both authorship and emergent
 189 complexity and can produce compelling narrative works. We make three important contributions
 190 critical to maintaining this balance: (1) constraining emergence with precise and limited context
 191 through a simplified hierarchical memory system; (2) directing autonomy through hybrid orchestration
 192 layers enabling mutual exclusion while allowing for turn-stealing; and (3) maintaining narrative
 193 coherence through a conversation graph that tracks topic centroids, engagement scores, and unresolved
 194 questions; and (4) ensuring tight coherence of embodied agents with their environment through a
 195 feedback loop of action and perception. These components work together to create a system that can
 196 generate coherent narratives while still allowing for the complexity and unpredictability of emergent
 197 storytelling.

198 However, significant challenges remain. Narrative coherence is hard to measure. Worlds, agents,
 199 and stories all change depending on the use case, making comparison across different architectures
 200 difficult. This will require efforts like [Kreminski et al., 2024], which seek to measure player experi-
 201 ence in AI-based games. Future efforts should seek to develop standardized sandbox environments
 202 and coherence metrics for evaluating emergent narrative quality, while enabling measurement of: (1)
 203 causal consistency measuring how well agents follow their backstory and established motivations; (2)
 204 coherences over long term interactions or when their behavior starts to break down; (3) emotional
 205 resonance measuring how well the narrative evokes emotional responses; and (4) surprise and unpre-
 206 dictability measuring how well the narrative surprises both players and its creators over repeated runs.
 207 Further, by expanding testing and evaluation to other domains such as education, therapeutics, or
 208 conflict resolution, these systems could serve as foundational tools for research and innovation or
 209 even enterprise applications.

210 5 Conclusion

211 Multi-agent LLM systems enable genuinely emergent storytelling through careful architectural design.
 212 Our agent orchestrator, hierarchical memory architecture, conversation graph, and action/perception
 213 feedback loop work in concert to maintain an embodied agent’s narrative coherence with the author
 214 while preserving their own emergent complexity. *Conflicts* and *The Game of Whispers* demonstrate
 215 these systems are capable of generating emotionally resonant stories that surprise even their creators.
 216 This paradigm shift from authoring content to designing possibility spaces is an exciting new frontier
 217 in computational creativity, interactive media, and world building that will have profound implications
 218 for the future of storytelling, not just in games, but likely in all forms of narrative media.

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