

The Sabre Narrative Planner: Multi-Agent Coordination with Intentions and Beliefs

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Paper link

Background

- Character coordination for interactive narratives: Allows single-agent solutions to multi-agent problems.
 - Omniscient, omnipotent central agent can manipulate characters to achieve the system's goals.
 - However, the player should perceive characters as individual agents with their own goals and limited knowledge.
- Sabre is a narrative planner: Guides characters to achieve global goals, but makes them seem autonomous.

Intention

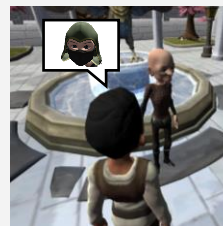
- Narrative plan: Sequence of explainable character actions
 - Explanation: Unexecuted plan in character's mind
 - Shows how action could contribute to character's goals



Tom wants to have a potion. He believes the Merchant is selling it at the Market. He intends to go to the market and buy it.



On the way to the market, Tom sees that a Bandit actually has the potion. His original plan was based on a wrong belief.



The Guard is looking for the Bandit. In his new plan, Tom points the Guard to the Bandit. He anticipates that this will cause...



...the Guard to apprehend the Bandit, giving Tom the opportunity to grab the potion.

Belief

- Characters have beliefs about state.
- Arbitrarily-deep theory of mind
 - X believes Y believes Z believes...
 - Characters anticipate others' actions in their own plans.

Fair Comparisons are Difficult

- Glave: No belief
- Virtual Storyteller, HeadSpace, IMPRACTical, Christensen et al.'s planner: Shallow or no theory of mind
- Ostari: Deep theory of mind, but complex belief formulas don't scale well