



A Computational Model of Plan-Based Narrative Conflict at the Fabula Level

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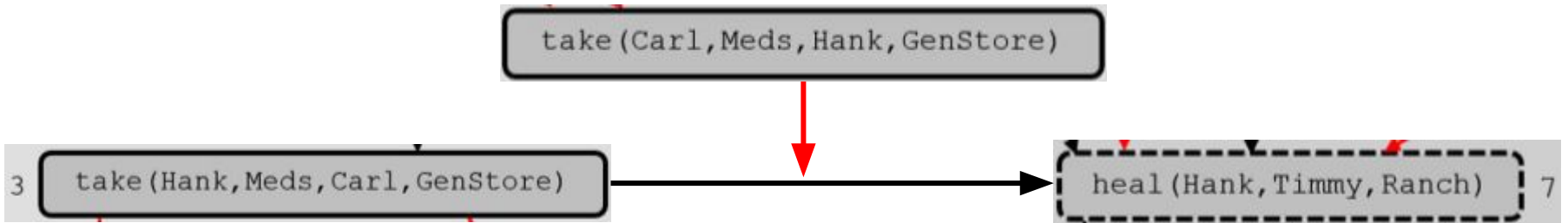


Background

- The IPOCL planner has characters that strive to achieve their own goals while the planner wants to achieve the problem's goal
- Since each character's goal must be achieved it is difficult to model any sort of conflict between characters
- Narratologists say that conflict is one of the most important parts of story telling

A model for conflict

- CPOCL extends on this planner to include a definition of conflict
- Each character has goals (intentions) and subplans (intention frame) that achieves those goals
- A conflict occurs when a step in an intention frame threatens a causal link in another (or the same) intention frame.
- If this step succeeds, the other intention frame fails





Dimensions of Conflict

- A way to measure the different properties of a conflict to gain info about them and compare them
- *Participants*: the characters involved in a conflict
- *Reason*: why the conflict exists
- *Duration*: The timesteps in which

heal (Hank, Timmy, Ranch)

shootout (William, Hank, GenStore)



Dimensions of Conflict (cont.)

- Character specific dimensions
- *Balance*: The likelihood of success

$$\text{balance}(c_1) = \frac{\pi(T'_1)}{\pi(T'_1) + \pi(T'_2)}$$

- *Directness*: How close characters are to each other (physical or family)

$$\text{directness}(c_1) = \frac{\sum_{i=1}^n \text{closeness}_i(c_1, c_2)}{n}$$

- *Stakes*: Difference between utility on success and failure

$$\text{stakes}(c_1) = |\text{utility}(c_1, T'_1) - \text{utility}(c_1, T'_2)|$$

- *Resolution*: Difference in utility after conflict ends

$$\text{resolution}(c_1) = \text{utility}(c_1, E) - \text{utility}(c_1, \emptyset)$$



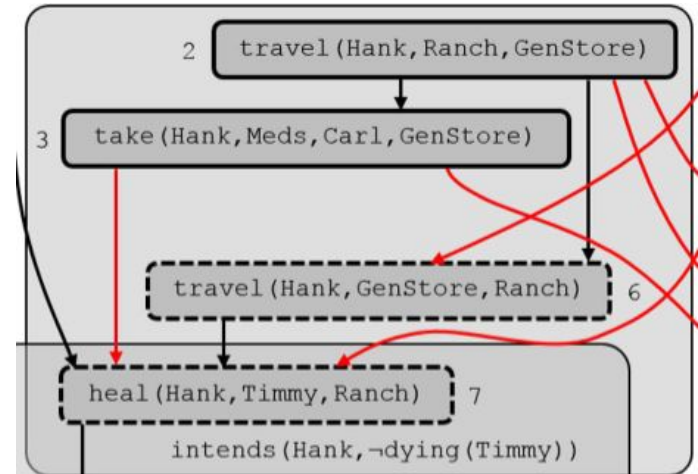
The CPOCL Planner

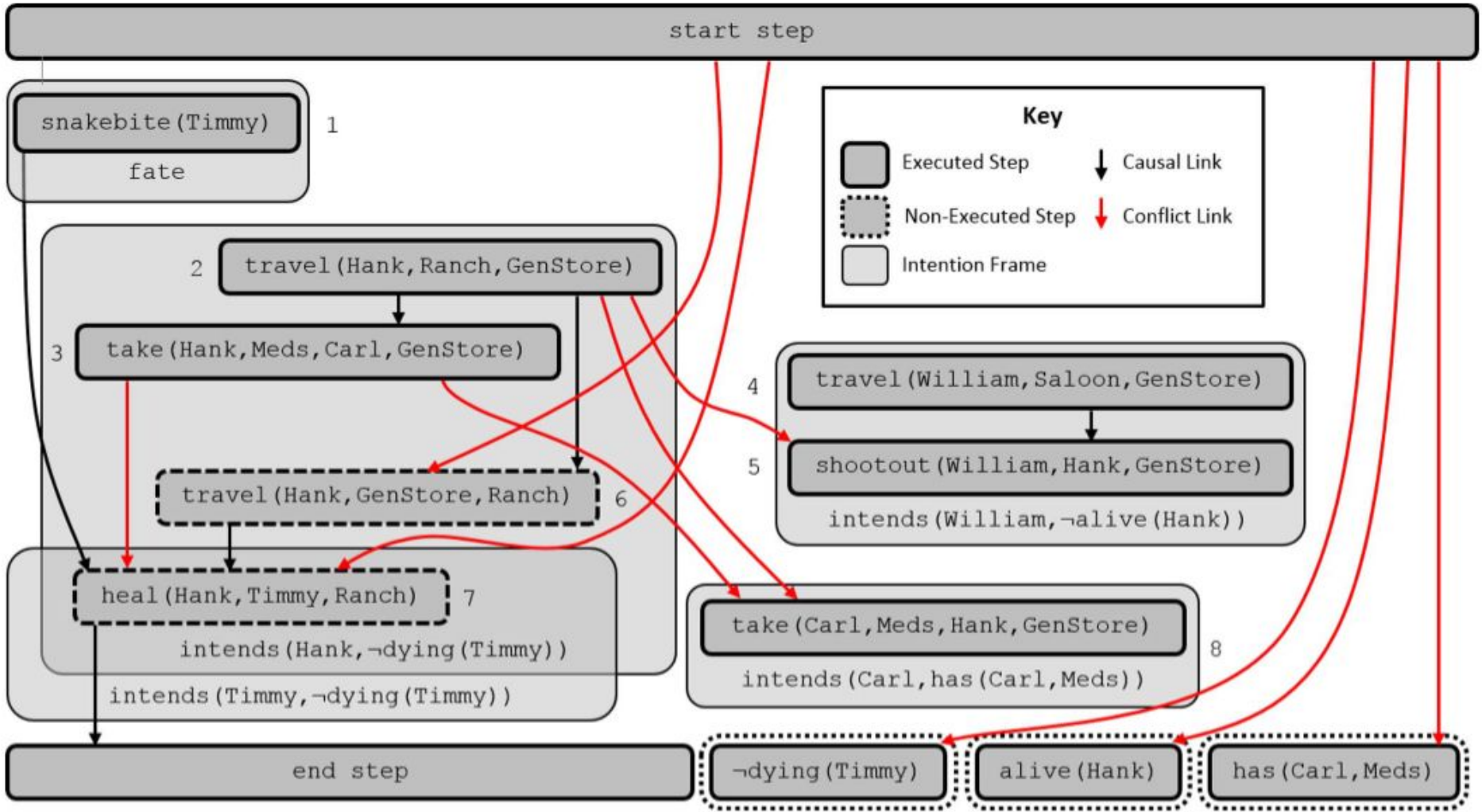
- Works like a typical Partial Order planner but now takes into account frames of intention
- Every action now belongs to a frame of intention
 - Anything “happenings” go to a special character called Fate
- Actions can either be executed or nonexecuted
 - This is how conflict is represented
- Intention frames are created whenever a step added has an *intend* effect
 - These open up new flaws that must be fixed
- New steps are unexecuted
- If a $a \rightarrow b$ is a causal link and b is executed, then a must be executed

Unsatisfied Intention Frame Flaw

- An intention frame needs a satisfying step that actually achieves the goal intended
- We can either find a preexisting step, create a new step, or use a persistent step

```
take(?p, ?i, ?h, ?l) “?p takes item ?i from ?h at ?l.”  
P:  alive(?p) ∧ at(?p, ?l) ∧ has(?h, ?i) ∧ at(?h, ?l)  
E:  has(?p, ?i) ∧ ¬has(?h, ?i) ∧  
    belongsto(?i, ?h) → { intends(?h, has(?h, ?i)) ∧  
    ∀?s sheriff(?s) → intends(?s, ¬alive(?p)) }  
C:  ?p  
  
heal(?h, ?p, ?l) “?h heals ?p at ?l.”  
P:  has(?h, Meds) ∧ alive(?h) ∧ at(?h, ?l) ∧  
    dying(?p) ∧ alive(?p) ∧ at(?p, ?l)  
E:  ¬dying(?p) ∧ ¬has(?h, Meds)  
C:  ?h, ?p
```







Generating a story

- The final partial order plan can be used to generate different stories
- We can use the dimensions of conflict from earlier to determine what the story will look like
- A (Most balanced for Hank), B (highest stakes), C (conflict with highest possible directness)

STORY A

Time	Step
1	snakebite (Timmy)
2	travel (Hank, Ranch, GenStore)
3	take (Hank, Meds, Carl, GenStore)
4	take (Carl, Meds, Hank, GenStore)
4	travel (Hank, GenStore, Ranch)
5	heal (Hank, Timmy, Ranch)
6	travel (William, Saloon, Ranch)
7	shootout (William, Hank, Ranch)

STORY B

Time	Step
1	snakebite (Timmy)
2	travel (Hank, Ranch, GenStore)
3	take (Hank, Meds, Carl, GenStore)
4	travel (William, Saloon, GenStore)
5	shootout (William, Hank, GenStore)
6	travel (Hank, GenStore, Ranch)
6	heal (Hank, Timmy, Ranch)
6	take (Carl, Meds, Hank, GenStore)

STORY C

Time	Step
1	snakebite (Timmy)
2	travel (Hank, Ranch, GenStore)
3	take (Hank, Meds, Carl, GenStore)
4	travel (William, Saloon, GenStore)
4	shootout (William, Hank, GenStore)
4	take (Carl, Meds, Hank, GenStore)
4	travel (Hank, GenStore, Ranch)
5	snakebite (Hank)
6	heal (Hank, Timmy, Ranch)
7	heal (Hank, Hank, Ranch)