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TaleBox – a mobile game for mixed-initiative story creation

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Creating stories appeals to a very wide public, but its computational automation is a very challenging endeavor (Kybartas and Bidarra 2016). We present TaleBox, a mobile game that enables a group of players to collaboratively create their own stories. TaleBox is a mobile card game in which players (authors) take turns to append their contribution to the story, properly combining in a creative way, within the chosen time constraints, the cards that they have been dealt. Cards make for an accessible and dynamic authoring tool.

The game uses a client-server architecture, in which a key role is played at the server by the card *hand generation* system, which tracks the progress of the story and selects for each player a variety of cards that promote both the story coherence and the authors' creativity. This approach strongly benefits from the use of GluNet, a generic, open-source knowledge-base that seamlessly integrates a variety of lexical databases and facilitates commonsense reasoning (Kybartas and Bidarra 2015). By combining, among others, the VerbNet and FrameNet databases, GluNet provides a very sound semantic basis to derive essential semantic relations, that are needed to generate coherent story content. GluNet also provides verbs and generic/abstract words to widen the story space, defined as the group of elements (characters, items, locations, etc.) taking a part in the story. This allows for the generation of a large variety of potential events that are meaningful at a given moment in the story.

After players have chosen a master plot, following the scheme of Tobias (1993), the system is able to determine what kind of major events should happen at each Story Point. These are based on the classical story building structure: Status Quo, Trigger, First Pivot Point, Midpoint, Second Pivot Point, Climax and Ending. In order to ensure coherence, the card hand generation system keeps track of each element's state after an action is performed. Following the notion of the Story Intention Graph (David K. Elson, 2012) and the semantics in GluNet, the system is also capable of assigning goals and other properties to the elements by processing the action. As a result, no actions will be permitted that contradict the current state of any story element, e.g. deploying a character that is dead.

We developed a mapping that associates roles and story genres to the words in GluNet. The system uses the genre to determine which vocabulary can go in the cards being dealt, while roles are checked against the word's semantics, to guarantee that at least one action is possible every turn. Once a set of words is selected, the system checks the story progress and its space. If the story is at a Story Point, a set of significant verbs for events

that match the plot's requirements for that Story Point will be selected, using the verb context and concepts in GluNet. If the story is between Story Points, many other verbs can be selected. The verb cards to be dealt are then randomly chosen from that selection.

The remaining cards, regarding locations, items and characters, will be chosen out of the story space and genre vocabulary selection. For the sake of coherence, the story space has priority, so only elements enabled by their current state can be selected (e.g. the character is not dead). Next, possible gaps of roles in the selected verbs will be filled from the genre vocabulary, so that at least one semantic frame for each verb is covered, thus ensuring an action per turn. Even if the gap was covered with the story state, extra cards will be offered to widen the available choices. Here we show an example card hand:

generated card hand			possible playable story actions
settles	peasant	field	peasant settles *on* kingdom
gives	kingdom	bush	peasant gives brother substance
poisons	brother	vegetation	brother poisons field *with* substance
grows	substance	illness	neighbourhood grows field *into* bush
appoints	neighbourhood		kingdom appoints vegetation *to be* illness

Card hands are dealt without distinguishing players, and all cards left after a turn are discarded, to ensure that only usable cards are kept in each player's hand. Players have to come up with the next move using the cards they were handed, so even if they had some plan for certain characters, they still have to creatively find their way using the cards they were given, which can be very enticing and fun.

To make TaleBox even more fun, a score system is kept for each story, rewarding the players who most contribute to it. Additionally, when a Story Point is reached, the player with the highest score is rewarded with choosing the major event in their turn. Major events are very valuable rewards, as they can drastically change the course of a story.

Besides being a game, TaleBox is, in fact, also a powerful mixed-initiative content generation system. Its output – structured and annotated stories, created through a combination of leading human creative work and computer smart authoring assistance – is recorded and stored in an open format. The story database is made available online to the whole community, scientific or otherwise, and can be very useful for a wide variety of applications needing annotated stories, searchable and classified by genre, vocabulary, length, etc…

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