Storytelling Model using Rhetorical Structure Theory

Arturo Nakasone (University of Tokyo)
Helmut Prendinger (National Institute of Informatics, Tokyo)
Mitsuru Ishizuka (University of Tokyo)

1. Research Motivation

Develop a general framework to create stories with narrative properties that is easy to use, given a set of annotated events

2. Research Objectives

Develop an ontology model for storytelling, which utilizes Rhetorical Structure Theory (RST) concepts and relations to generate story event sequences

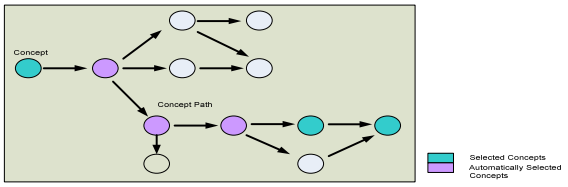
Identify the conceptual relations between RST relations and Storytelling principles and create rules and/or mechanisms to enforce such principles

3. Concept Ontology

A Concept Ontology is a networked organization of issues, which are connected with directed arrows, showing a traversing path from any concept to another.

Each node is defined as a Concept (Topic or theme)

This schema allows us a pseudo-temporal representation



4. RST Ontology

The RST ontology is a set of classes, properties, and general rules that define how story units are joined to form stories.

Entity Classes

An Event is defined as a single piece of meaningful information worthy of being shown.

A Relation is a rhetorical binding between two entities, which states a specific rhetorical function

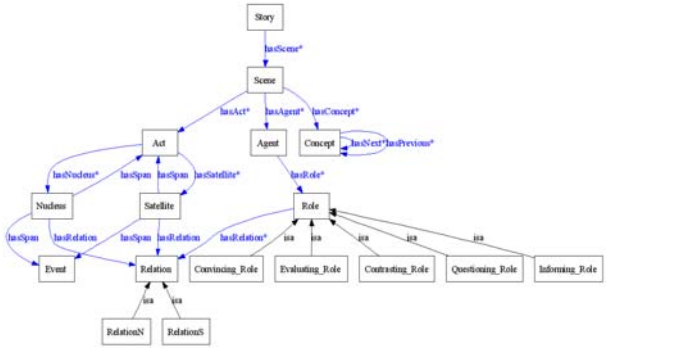
An Act is defined as a subset of a Scene, whose Events are connected through Relations

A Scene is defined as a set of Acts, which are grouped in the context of a single Concept

Presentation Classes

An Agent is an actor in the context of multimedia presentations, which is in charge of stating or presenting an Event

A Role is a part that an Agent plays during a single Scene. Roles are constrained by the defined Relation objects.



5. RST Event Organization

The main idea is to be centered in the notion of Conflict. A Conflict is a stated intention of change in the current situation. Therefore, RST Relations are categorized into:

Conflict Relations: Provides a way to change current state of affairs

CONTRAST, SOLUTIONHOOD, ELABORATION, CONSEQUENCE, SEQUENCE

Resolution Relations: Provides a way to understand the current state of affairs. Example: BACKGROUND, CAUSE, PURPOSE, RESULT, etc.

6. RST-based Story Construction Rules

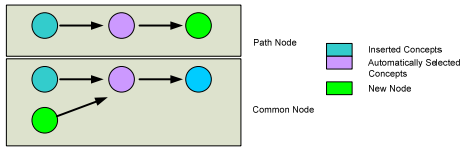
Concept Order for a Story:

Solved through the Concept Ontology

Concept Insertion Rules:

Path Node : New Node is an end node

Common Node : New Node is a begin node



Act Selection for a Concept:

Conflict Resolution Value (CRV)

Number of possible conflicts in the different levels of an Act

$$CRV(A_i) = C_0(A_i) + \sum_{j=1}^{n} \frac{C_j(A_i)}{2j} \quad , \quad C_j(A_i) = \sum_{k=1}^{5} CV_k \times N_k(j)$$

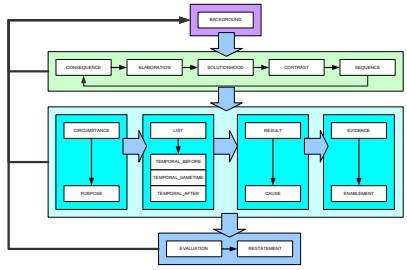
Multinuclear Relations Value (MRV)

Number of multinuclear relations in several levels of an Act

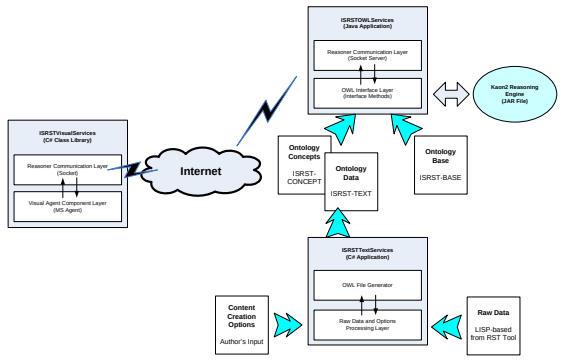
$$MRV(A_i) = N_0(A_i) + \sum_{j=1}^{n} \frac{N_j(A_i)}{2j}$$

Event Order for an Act:

Event Path Template



7. Application Design



8. Conclusions and Future Work

We have presented a way to construct stories with narrative properties through the use of RST annotated events.

Future work for this research includes:

* Create a text corpus to test the application
* Refine the rules for Agent Presentation through the use of Dialog Markers
* Implement Fixed Dialog Phrases for Story Component Transitions:
  - Opening and Closing a Story
  - Concept and Act Transition
  - Relation Detail Markers