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Creative Stories

A Storytelling Game Fostering Creativity

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Outline

- ▶ Problem Definition
 - Design machines fostering non-linear thinking
- ▶ Proposed Approach
 - Incorporating the Semantic Lateral Thinking technique in a Storytelling Game
- ▶ Showcase: Creative Stories
 - Setup
 - Gameplay
- ▶ Automating the Assessment Process
 - Computational Creativity Metrics
- ▶ Conclusions & Next Steps



Semantic Lateral Thinking

- ▶ Involvement of Computers in the Creative Process
 - Computers as independent creative entities
 - Computers as tutors to creative activities
 - *Cooperation of humans–machines for producing creative ideas*
- ▶ *Semantic Lateral Thinking* (SLT) is well–suited for establishing a cooperation framework
 - Introduction of a foreign conceptual element for disrupting preconceived notions and habitual thought patterns



SLT Computational Tools

- ▶ Set of Computational Tools introducing SLT stimuli in the storytelling process
- ▶ Thinking Seed Generator
 - Given an initial phrase the tool returns an alternate phrase with some semantic distance from the initial
- ▶ Web Miner
 - Crawls the web to discover the dominant terms found in web pages related to an initial search phrase
- ▶ Cloud of Thoughts
 - Provides a summary of a text, discovering the main themes and concepts within it
- ▶ Competitive Thinking Spaces
 - Clusters the dominant terms of a text segment in the main topics covered by that segment

Showcase: Creative Stories

»» a group-based Storytelling Game





Game Flow

- ▶ Players produce their stories in fragments
- ▶ They are asked to use SLT stimuli within their stories
 - Creative Input (Thinking Seed + Web Cloud)
 - Competitive Thinking Spaces
- ▶ The incorporation of such stimuli increases their game score



Gameplay – Creative Input

Game Score

Thinking Seed Generator

Web Miner

Creative Stories - Student View - Play (Creative Input)

My Score
Creative Points

Creative Input

Thinking Seed
museum
+ 2 Points

Web Cloud
art
paint band
+ 8 Points

Change Difficulty

Refresh

My Story (GROUP 2)
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.
Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.
Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
+ 12 Points

Submit

Other Scores
Creative Points

What Others Say

Group 1
family
culture
politics

Group 3
music
urban

Teacher Hint
Excepteur sint occaecat cupidatat non proident ...

Play Rank Wrap-up

Cloud of Thoughts



Gameplay – Thinking Spaces

Creative Stories - Student View - Play (Competitive Thinking Spaces)

My Score
Creative Points

Thinking Spaces

Space #1
art band
paint

Space #2
flute perform
piano

Space #3
film actor
stars

My Story (GROUP 2)

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.

Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

+ 12 Points
Submit

Other Scores
Creative Points

What Others Say

Group 1
family
theatre art culture politics

Group 3
celebrity
fashion magazine gig . music urban

Teacher Hint
Excepteur sint occaecat cupidatat non proident ...

Play Rank Wrap-up

Competitive Thinking Spaces

Cloud of Thoughts

Automating the Assessment Process



- ▶ Scoring in Creative Stories relies on the creativity exhibited during storytelling
- ▶ The game incorporates mechanisms for automatically assessing the exhibited creativity
 - Inspired by major computational creativity metrics
 - Formulation of metrics over the specific storytelling context



Computational Creativity Metrics

- ▶ **Novelty**
 - Average semantic distance of dominant terms in the story, compared to the average semantic distance in the whole story set
- ▶ **Surprise**
 - Average semantic distance between consecutive story fragments
- ▶ **Recreational Effort**
 - Sum of weights in the min-weight closure of the story's cluster graph
- ▶ **Rarity**
 - Number of term clusters in the story compared to average number of cluster in the whole story set



Conclusions

- ▶ In the context of designing machines fostering non-linear thinking Semantic Lateral Thinking is a well-suited technique
- ▶ SLT can be introduced in a creative process via the usage of appropriate computational tools
- ▶ In the case of storytelling the SLT disruptors can be lexical entities, semantically and contextually distant from the currently established story
- ▶ An automatic creativity assessment method is essential to the process (e.g. via the usage of the proposed metrics)



Next Steps

- ▶ Pilot creative stories in a real world setting
- ▶ Associate Computational Creativity Metrics with the human perception for Creativity
 - Obtain human rankings for the created stories during the pilots
 - Discover correlation of rankings and computational creativity metrics
- ▶ Refine creativity metrics with respect to their assessment over established literary work

Thank You!



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