Bridging the Gap Between Computational Narrative and Natural Language Processing

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February 4th 2017 – AAAI W17: What's Next for AI in Games?
Introduction

Narratology

Computational Narrative

Natural Language Processing

Artificial Intelligence
Motivation

Joe Bear was hungry. He asked Irving Bird where some honey was. Irving refused to tell him so Joe offered to bring him a worm if he’d tell him where some honey was. Irving agreed. But Joe didn’t know where the worms were, so he asked Irving, who refused to say.

Tale-spin [Meehan 1976], ASD [Riedl 2011], Opiate [Fairclough 2007]
Authorial Bottleneck Problem

- Input required by OPIATE

### Characters, Attitudes, ...

<table>
<thead>
<tr>
<th>Character Name</th>
<th>Initial Attitudes</th>
<th>Initial Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lili</td>
<td>Likes Mimo &amp; Bibi</td>
<td></td>
</tr>
<tr>
<td>Mimo</td>
<td>Likes Lili &amp; Bibi</td>
<td></td>
</tr>
<tr>
<td>Bibi</td>
<td>Likes Lili &amp; Mimo</td>
<td></td>
</tr>
<tr>
<td>Snomm</td>
<td></td>
<td>Magic Mirror Problem</td>
</tr>
<tr>
<td>Blobar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sergeant Lip</td>
<td>Likes Trivmaj &amp; Foot Dislikes Bonji</td>
<td></td>
</tr>
<tr>
<td>Corporal Foot</td>
<td>Likes Trivmaj &amp; Lip Dislikes Bonji</td>
<td></td>
</tr>
<tr>
<td>Trivmaj</td>
<td>Dislikes Bonji</td>
<td>Whirlwind Wand</td>
</tr>
</tbody>
</table>

### Locations, Props, ...

- Opiate [Fairclough 2007]
Motivation

Story Workbench [Finlayson 2011], Scheherazade [Elson 2012]
Motivation

ProppASM [Finlayson 2011], Social Networks [Elson 2010]
How can we bridge the “gap” in computational narrative in order to solve the authorial bottleneck problem?
Open Problems

- “Gap” in Computational Narrative
- Authorial bottleneck

- How to model narrative?
Open Problems

• “Gap” in Computational Narrative
• Authorial bottleneck

• How to model narrative?
• How to adapt and reuse general purpose NLP/IE?
Open Problems

- “Gap” in Computational Narrative
- Authorial bottleneck

- How to model narrative?
- How to adapt and reuse general purpose NLP/IE?
- How would an author use a NL interface to a CN system?
Open Problems

- “Gap” in Computational Narrative
- Authorial bottleneck

- How to model narrative?
- How to adapt and reuse general purpose NLP/IE?
- How would an author use a NL interface to a CN system?
- How to evaluate narrative IE systems?
Conclusions

- Narrative
- Natural Language Processing
- Comp. Models of Narrative
- PCG & Narrative Systems
- Content & Experiences

Images:
- "Russian Fairy Tales"
- "The Policeman's Beard is Half Constructed"
Thanks
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Backup Slides
Neural all the things!
Once upon a time, Bonji ran into Lili, Mimo and Bibi, three friends who lived in a hut. In a field nearby lived Snomm who had a Magic Mirror. Past the field and further into the woods lived Blobar. In the other side of the woods there was a little town where Sergeant Lip and Corporal Foot lived. They stole the Magic Mirror. [...]
Once upon a time, Bonji ran into Lili, Mimo and Bibi, three friends who lived in a hut. In a field nearby lived Snomm who had a Magic Mirror. Past the field and further into the woods lived Blobar. In the other side of the woods there was a little town where Sergeant Lip and Corporal Foot lived. They stole the Magic Mirror. [...]
Automated Narrative Information Extraction

- Voz

Diagram:
- Natural Language Preprocessing
- Mention Extraction
- Coreference Resolution
- Feature-Vector Assembly
- Character Identification
- Role Identification
- Function Identification
- External Knowledge
- Examples
- Domain Knowledge
Story Graphs
Evaluation of IE Pipelines

Results

![Graph showing error introduced by modules](image)

- Coreference
- Voting for Roles

Error introduced by $m_1$
Error introduced by $m_2$
Error introduced by $m_3$
Error introduced by $m_4$
Error introduced by $m_5$
Error introduced by $m_6$
Error introduced by $m_7$
Error introduced by $m_8$