It’s the Same Old Story! Enriching Event-Centric Knowledge Graphs by Narrative Aspects

WebSci’22 @ Barcelona, Spain

Florian Plötzky and Wolf-Tilo Balke
Institute for Information Systems
TU Braunschweig, Germany
Motivation

• Events of varying importance rule our lives
  – Event: ‘interactions between participants that happen at a given place to a known time’
  – Increasing interest in events in the last years:
    • Prediction Tasks
    • Event-Chain completion
    • Event Representation
On Narrative Aspects

• Humans assume an *intrinsic narrative structure* when dealing with (complex) events
  – i.e., they connect the dots between the event and their prior experience with similar event types
• Structural components of events
• Narrative elements of events
  – Discourse regarding particular events
  – *Narrative attributions*
News, social media, and other textual descriptions oftentimes make certain *attributions* to an event or its’ participants

- **Objective attribution**
  - e.g., is_underdog(event, participant)

- **Subjective attributions**
  - e.g., is_aggressor(event, participant, viewpoint)
Narrative Prototypes

NP: David vs. Goliath

(i) Event pattern: conflict[^super_type]
(ii) Refinements:
   is_underdog(X, conflict) \land \text{role}(X, \text{conflict}) = \text{'winner'}

Query Processor

NP: Gulf War

(i) Event pattern: ‘Gulf War ’91[^event]
(ii) Refinements:
   is_aggressor(X, ‘Gulf War ’91, ‘western_vp’)
   \land X[name] = ‘Iraq’

Query Processor
• Retrieval of events based on narrative prototypes
• Critical points:
  – subjective attribution evaluation (RQ1)
  – query performance (RQ2)
RQ1: Evaluation of subj. attributions

- How to evaluate subjective attributions?
  - Sample data for:
    - 3 viewpoints
    - 5 conflicts
  - Extractive Question Answering task based on RoBERTa
    - (doc, “Who is <ATTRIBUTION> in <EVENT>?”)

<table>
<thead>
<tr>
<th></th>
<th>Crimea Crisis</th>
<th>Gulf War</th>
<th>Iraq War</th>
<th>Ukraine Conflict</th>
<th>Vietnam War</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York Times</td>
<td>79</td>
<td>129</td>
<td>129</td>
<td>79</td>
<td>42</td>
</tr>
<tr>
<td>Washington Post</td>
<td>79</td>
<td>83</td>
<td>106</td>
<td>79</td>
<td>54</td>
</tr>
<tr>
<td>Daily Mail</td>
<td>91</td>
<td>28</td>
<td>70</td>
<td>66</td>
<td>12</td>
</tr>
<tr>
<td>The Guardian</td>
<td>78</td>
<td>51</td>
<td>127</td>
<td>79</td>
<td>1</td>
</tr>
<tr>
<td>RT.com</td>
<td>78</td>
<td>10</td>
<td>73</td>
<td>78</td>
<td>5</td>
</tr>
<tr>
<td>Sputniknews</td>
<td>79</td>
<td>8</td>
<td>10</td>
<td>79</td>
<td>1</td>
</tr>
</tbody>
</table>

US  UK  RU
RQ1: Evaluation of subj. attributions

• Small scale study regarding the detection of subjective attributions
  – Validated by 3 human raters
    • 4 S. Attributions
    • Fleiss $\kappa = 0.33$
  – Problems:
    • Weak semantic
    • Context and Citation problems
RQ2: Query Performance

• Query improvement by utilizing indexing
  – Objective: reduce the query load for subjective attributions:
    • Index each participant for the subj. attributions
    • Bloom Filter is enough for this purpose
Summary and Outlook

• Narrative Prototypes offer a unified way of describing events in context of:
  – Structural elements (e.g., from knowledge bases)
  – Narrative aspects mostly from textual resources

• Still, a lot of work remains
  – Semantics of subjective attributions
  – Large scale experiments
  – Fine grained viewpoints (perceptual components of viewpoints)
Thank You!

If you have any questions, contact me via:

ploetzky@ifis.cs.tu-bs.de