Facilitating Discourse Analysis with Interactive Visualization

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RESOURCES

• RST Discourse Treebank Corpus
  • 385 Wall Street Journals
  • Annotated manually by linguists
• Different parsing algorithms
To Design Better Parsers

• Meaningful text chunks merging on each tree level?
• Errors propagations during the node merging and relation labelling process?
• Differences of parsing results across algorithms?
• Differences of parsing results across documents?
WHAT IN THEIR MINDS VS. WHAT THEY REALLY SEE

DAViewer
DAViewer: Core Visualizations

dendrogram
DAViewer: Core Visualizations

Icicle-plot

dendrogram
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dendrogram
DAViewer: Interface
Design DAViewer

- Problem identification and quick prototyping
- Initial implementation
- Refined prototype
- System release and field test
**Evaluation**

- 3 weeks in realistic work settings
- 1 domain expert user
- Interaction logging
- Analysis diaries
- Email and phone communication
- Interviews
RESULTS

• Log files analysis
• Qualitative feedbacks
• Usage scenarios
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Overall function usage

- dataset management (0.5%)
- overview and tree subset (9.2%)
- detail panel manipulation (14.8%)
- tree exploration (53.2%)
- text display (0.3%)
- annotation (6.4%)
- querying (9.8%)
- interactive legend filtering (5.8%)

Function usage in a typical session
RESULTS

• Log files analysis
• Qualitative feedbacks
• Usage scenarios

“I used to draw trees by hand according to the output text files, so I could only compare 2 or 3 trees at a time and they are basically simple trees around 5 levels. With DAViewer I can compare many large trees efficiently. All trees are nicely aligned and the interactions allow me to focus on subtrees easily.”

“I used to insert debug code inside the parsers, for a verbose output, but it is tedious and almost impossible to find patterns. Now, I can do it visually by just creating what I need and clicking a button.”

“I know I want the tree levels aligned from the bottom, but I can’t draw such layout from the output file in one round since the tree nodes are indented in the depth-first order.”
RESULTS

• Log files analysis
• Qualitative feedbacks
• Usage scenarios
FUTURE WORK

• More evaluation for widespread adoption
• More interactions for tree exploration
• More integrated working environment
• Extension of visualization techniques to other domains for tree structure comparison and analysis
FACILITATING DISCOURSE ANALYSIS WITH INTERACTIVE VISUALIZATION

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RESULTS: PATTERNS OF USAGE

Time

dataset management (0.5%)
overview and tree subset (9.2%)
detail panel manipulation (14.8%)
tree exploration (53.2%)
text display (0.3%)
annotation (6.4%)
querying (9.8%)
interactive legend filtering (5.8%)
RESULTS: USER FEEDBACK

• “I used to draw trees by hand according to the output text files, so I could only compare 2 or 3 trees at a time and they are basically simple trees around 5 levels. With DAVviewer I can compare many large trees efficiently. All trees are nicely aligned and the interactions allow me to focus on subtrees easily.”

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