Visualizing Social Media Content with SentenTree

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Unstructured Text Documents

Twitter/Social Media collections are many unstructured text documents

Unstructured text documents are hard to analyze!

Many authors, redundant information

Can accumulate many of these documents in short time

Summarizing Unstructured Documents

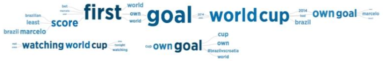
Could extract common information & present a world cloud

Word clouds good at a glance to gain overarching theme

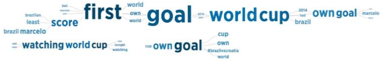
World clouds lose concepts and structure

How do we maintain semantic representation?

SentenTree



SentenTree



Node-link visualization with force-directed placement

Edge between words indicates occurrence in same tweet

Spatial arrangement is syntactic ordering

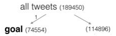
Large font indicates high frequency of occurrence

Frequent Sequential Patterns

Initialization steps:

- Normalize tweets
- Perform tokenization
- Root node of tree of sequential patterns is initial pattern
- Initial pattern contains no words
- Grow new sequential patterns from the root

Frequent Sequential Patterns

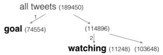


all tweets (189450)

1

goal (74554) (114896)

Frequent Sequential Patterns



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goal (74554) (114896)

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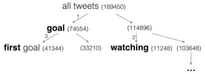
watching (11248) (103648)

Frequent Sequential Patterns



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...

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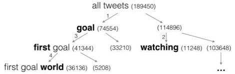

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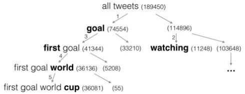

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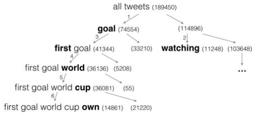

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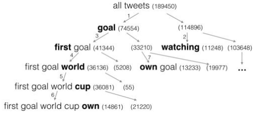
Frequent Sequential Patterns



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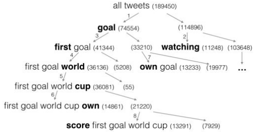

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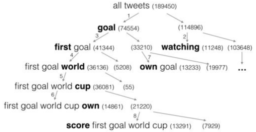

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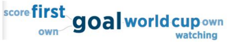

Interaction Demo

https://twitter.github.io/SentenTree/

Visual Encoding

SentenTree uses a constrained force-directed placement algorithm

Placement constraints: word order, vertical, horizontal

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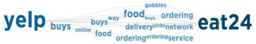

Only word order constraint applied

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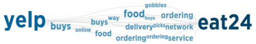

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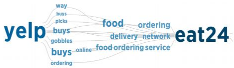

Horizontal and vertical constraints added

Considerations: Tokenization

Stop words and punctuation removed

Numbers, hashtags, urls, @ handles are matched

No stemming performed

Critique

The Bad:

No stemmer

Final visualizations are still sometimes ambiguous

Critique

The Good:

System accomplishes design goals

Well written paper, easy to understand examples

Scalable

Thanks!

Questions?