Georgia Tech Visualization Lab

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Visualizing social media content with SentenTree

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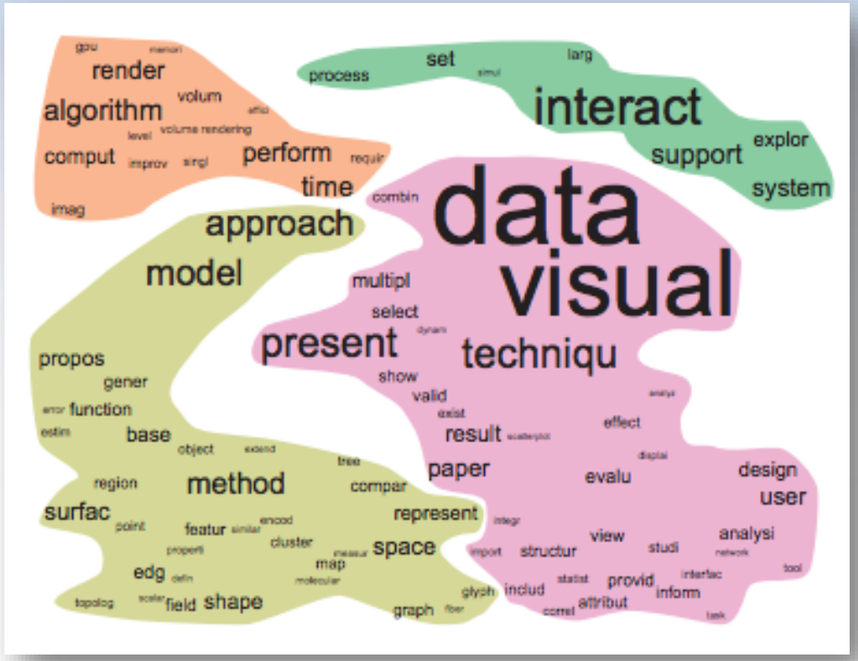
information interfaces

Visualizing textual content

- Keywords
  - Text cloud, Wordle, semantic word cloud, parallel tag cloud, etc.

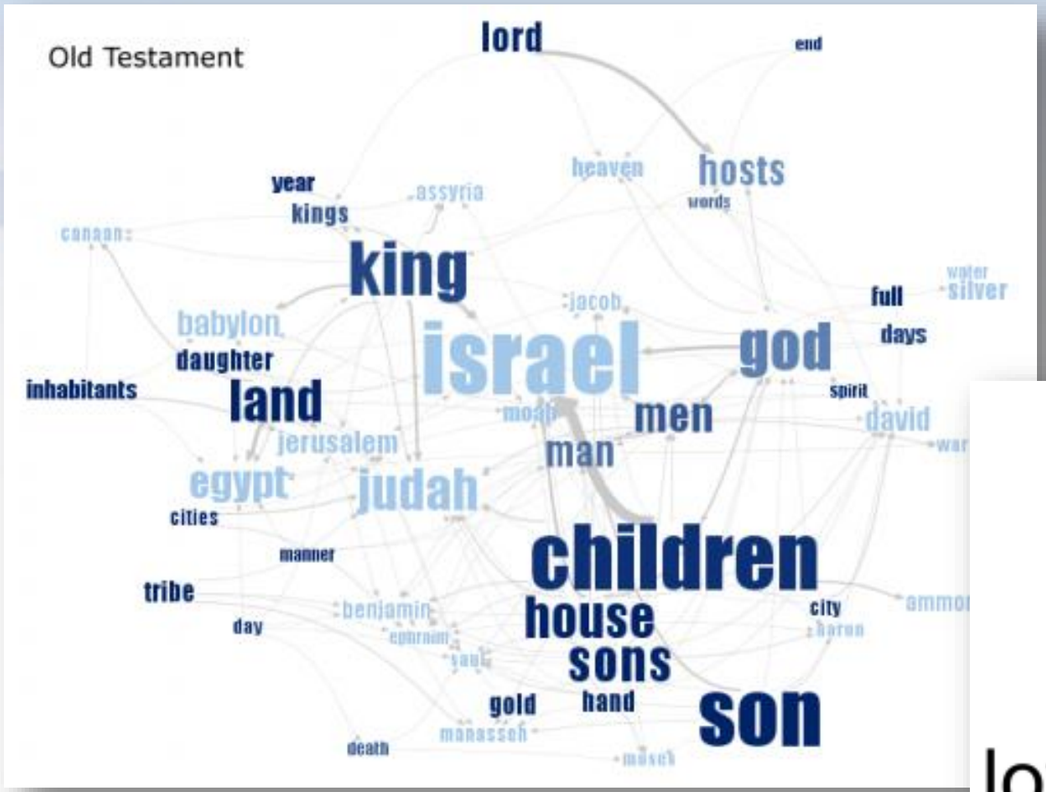
- Text structures
  - Word Tree, Double Tree, etc.
  - PhraseNet

Wordle, Viegas et al. 09



Seam-carving word cloud, Wu et al. 11

Parallel tag cloud, Collins et al. 09



Phrase net, Van Ham et al. 09

Word tree, Wattenberg and Viegas 08

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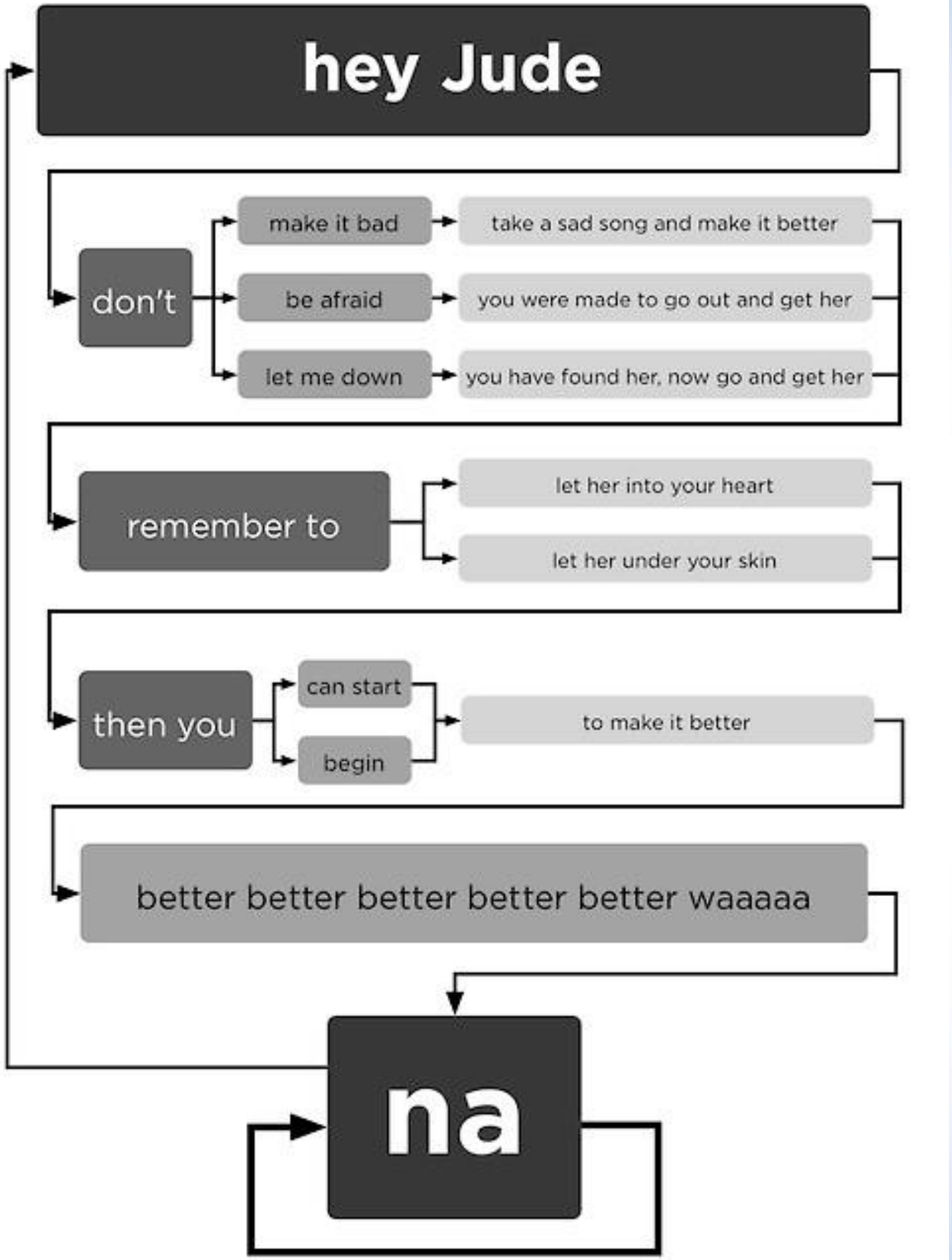
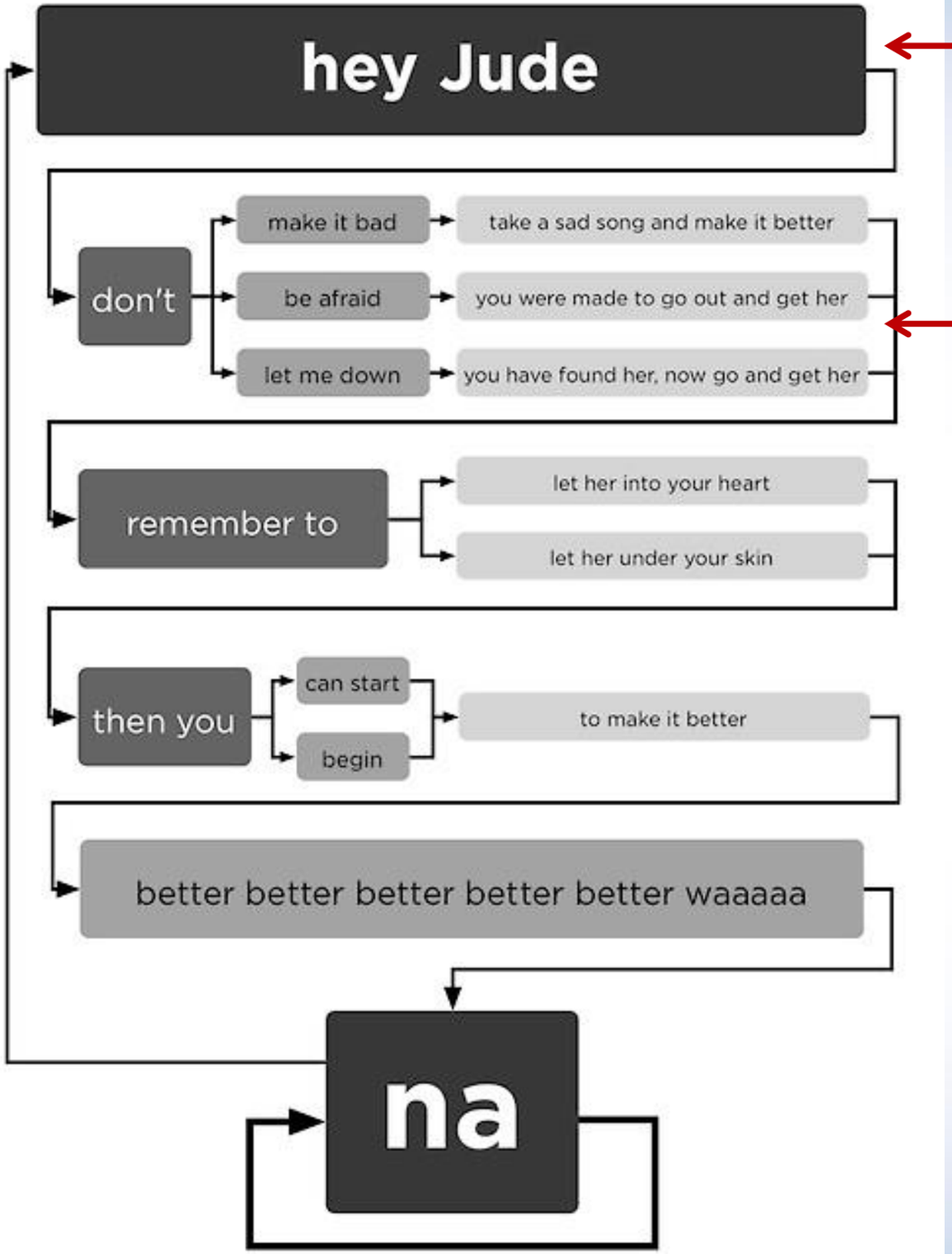


http://lovealllthis.tumblr.com/post/166124704



Recurring segments collapsed and larger

Non-recurring segments aligned

http://lovealllthis.tumblr.com/post/166124704

Design goals of SentenTree

- Highlight topics with keywords
- Show keywords in context
- Coverage and conciseness
  - Show fragments instead of full sentences
  - Remove stopwords and punctuations
  - Collapse common fragments
- Summary and Details
  - Show original context on demand
  - Enable drill-down

SentenTree visualization demo

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Building a SentenTree vis

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Constructing frequent sequential patterns

- I love the World Cup!
- RT if you are watching the World Cup today!
- Marcelo opens the World Cup scoring with this own goal to give Croatia the Lead.
- The first goal of the World Cup is an own goal by Brazil!
- This is the best goal so far in the World Cup: Marcelo’s own goal.

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Constructing frequent sequential patterns

- world cup (5)
- world cup own goal (3)
- goal world cup own goal (2)

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goal – world cup – own goal

Force-directed layout with constraints

- Implemented with the CoLa package
  - http://marv1.infotech.manash.edu/webcola/
- Constraints:
  - Words in a pattern: left to right order
  - Bigrams: shorten edge, center words vertically
  - Child branches: center horizontally

yelp
buys
online
food
ordering
buys
way
food
buys
ordering
delivery
picks
network
gobbles
ordering
service
eat24

yelp
buys
online
buys
way
food
food
gobbles
buys
ordering
delivery
picks
network
ordering
ordering
service
eat24
yelp
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ordering
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delivery
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eat24

Performance

- Time cost
  - Pattern generation: linear to number of sentences in dataset
  - Graph layout: depends on complexity of graph
- Javascript implementation, Chrome browser, Macbook Air
- Test results:
  - 10k – 2 sec
  - 100k – 20 sec
  - 1M – 2 minutes

Observations and initial feedback

Natural content clustering

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Data analysts feedback

- Like
  - Frequent words “pop out” with frequency count
  - Context available through hovering
  - Similar content grouped together
  - Shows major topics
  - Less frequent content discoverable

Data analysts feedback

- Learn
  - Same word appears multiple times
  - Drill down, search, etc.
- Suggest
  - Improve packing algorithm to remove whitespace
  - Reduce noise
    - Stemming and spell checks
    - Filters

  Show more information: meta-info on user, sentiment, etc.

Takeaway

- SentenTree is a novel visualization technique for social media text that both summarizes topics (through keywords) and shows context (through sentence fragments).

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SentenTree: Make TextVis great again

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