Text Intro

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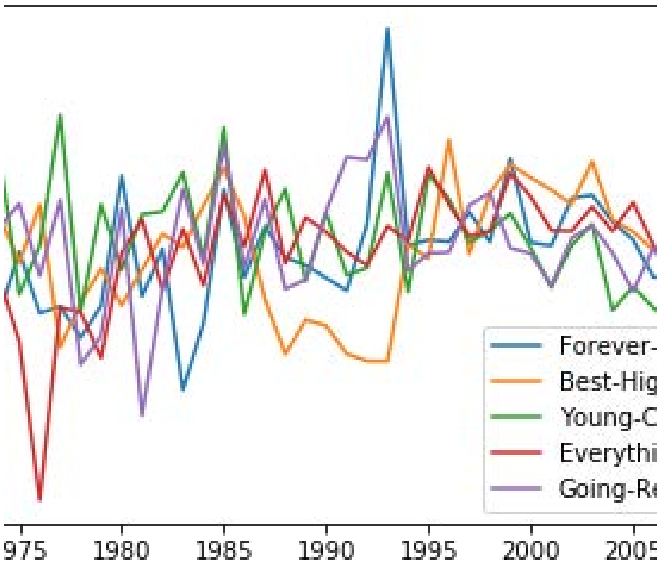
Syracuse University

Finding Meaning in Text Data

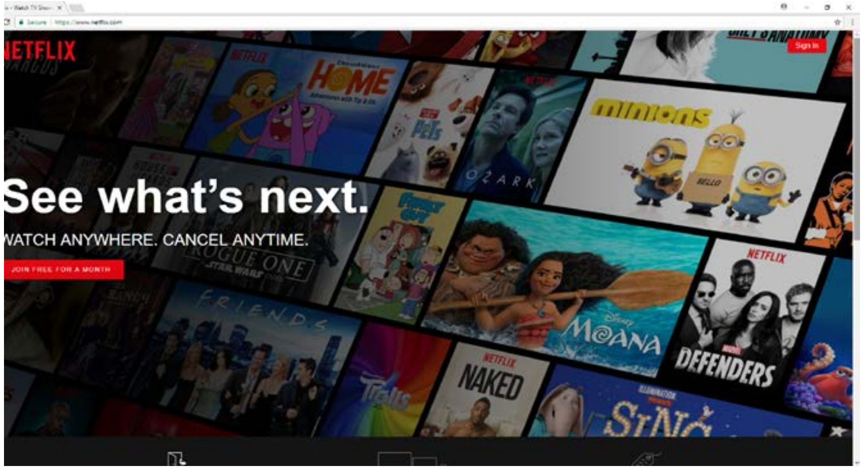
- **Obtain**
- **Scrub**
- **Explore**
- Model
- iNterpret

• One of the Funniest Police Shows Ever	(1974)
• Mosaiken und Fresken als Zeugen	(1975)
• Let all the poisons that lurk in the mud	(1976)
...	
• 12 days that shook Chile	(2011)
• The Movie Unrated and Uncensored	(2012)
• Pretty on the outside, ugly crying on the inside	(2013)



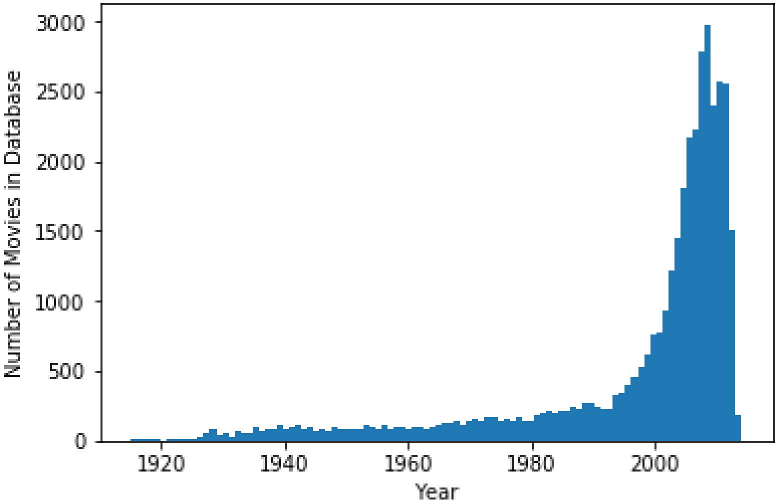
Our Challenge This Week?

What Are the Movie Trends?

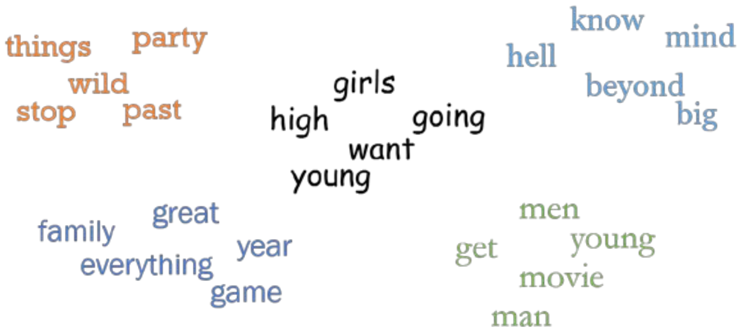


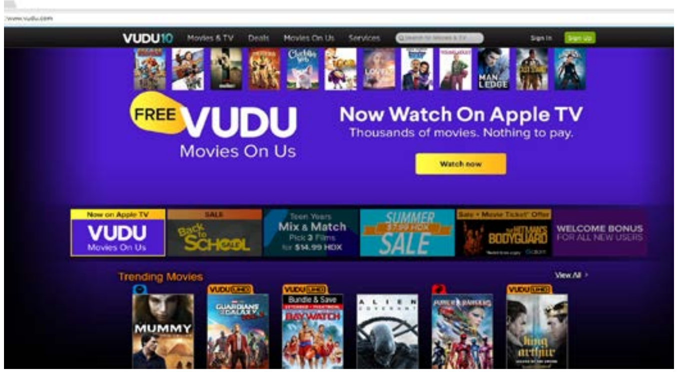
See what's next.

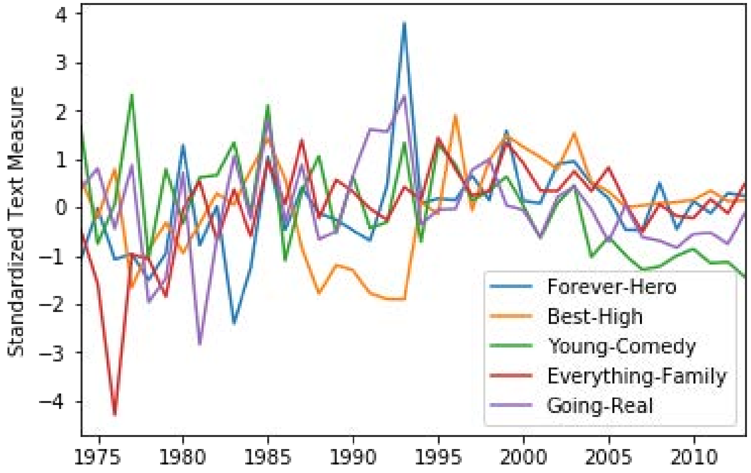
WATCH ANYWHERE. CANCEL ANYTIME.



Can We Use Text Analytics to Detect Trends?







Data Review

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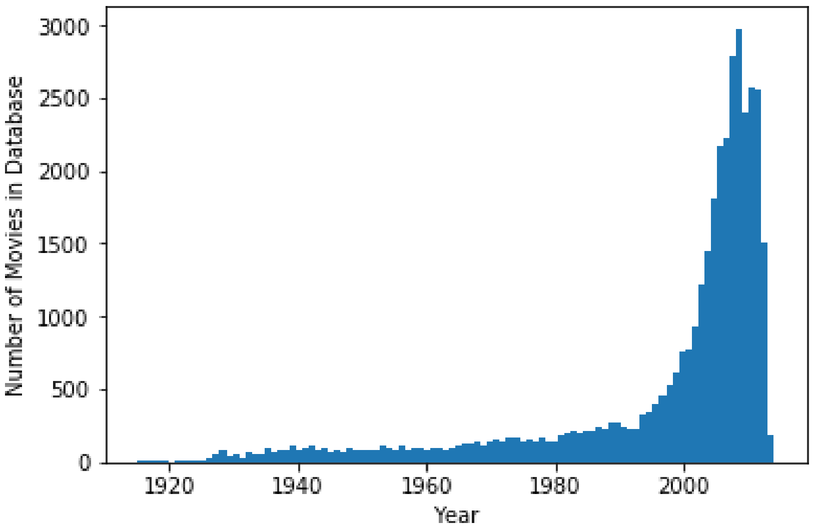
Text Data



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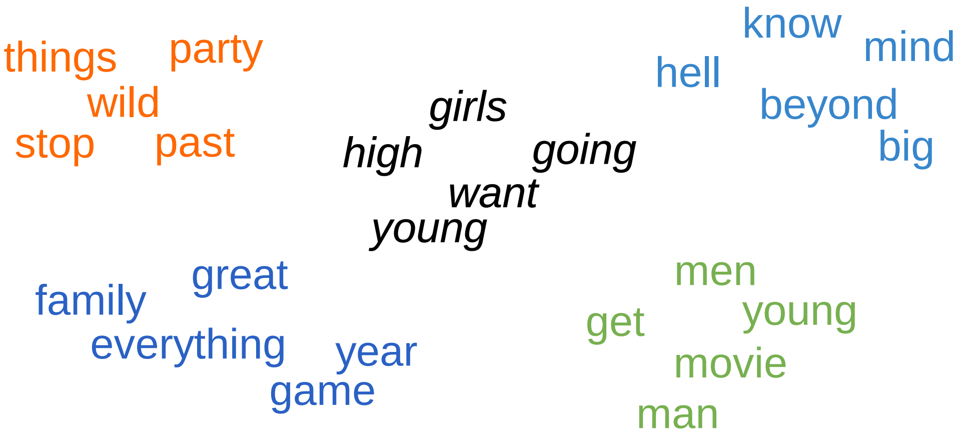
Bag of Words



things party wild stop past

girls high going want young

hell know mind beyond big

family great everything year game

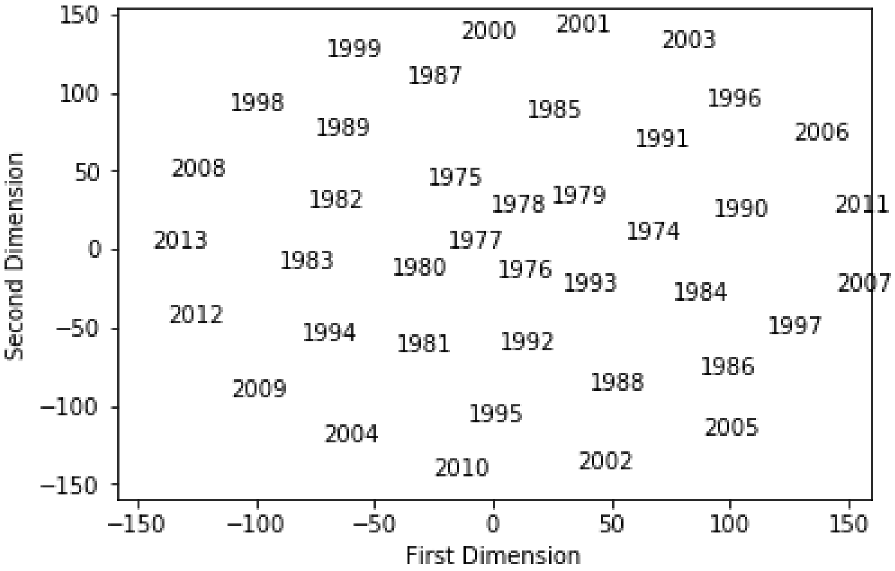
get men young movie man

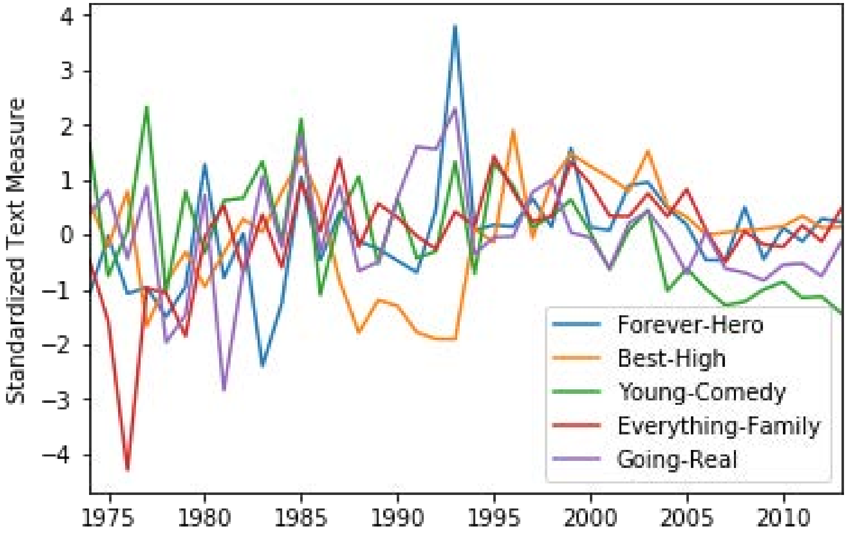
- One of the Funniest Police Shows Ever (1974)
- Mosaiken und Fresken als Zeugen (1975)
- Let all the poisons that lurk in the mud (1976)

...

- 12 Days That Shook Chile (2011)
- The Movie Unrated and Uncensored (2012)
- Pretty on the Outside, Ugly Crying on the Inside (2013)

Bag of Words (cont.)





Sentiment Analysis

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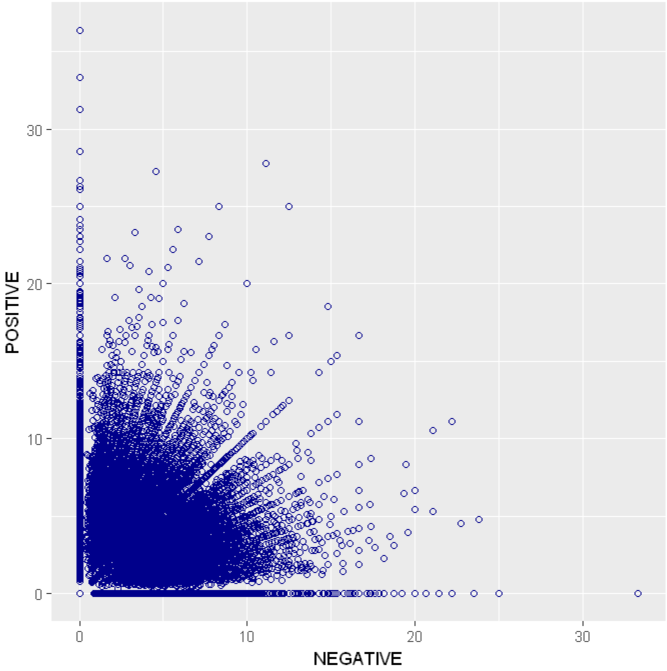

Recommendation

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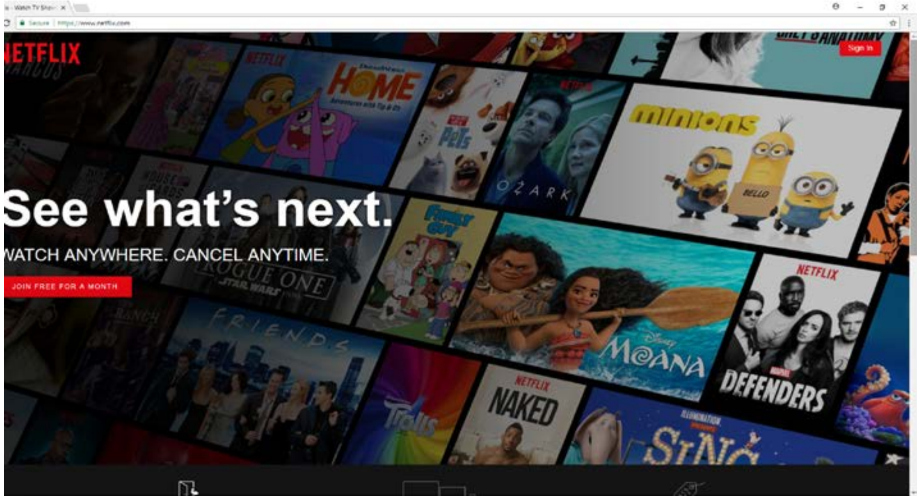
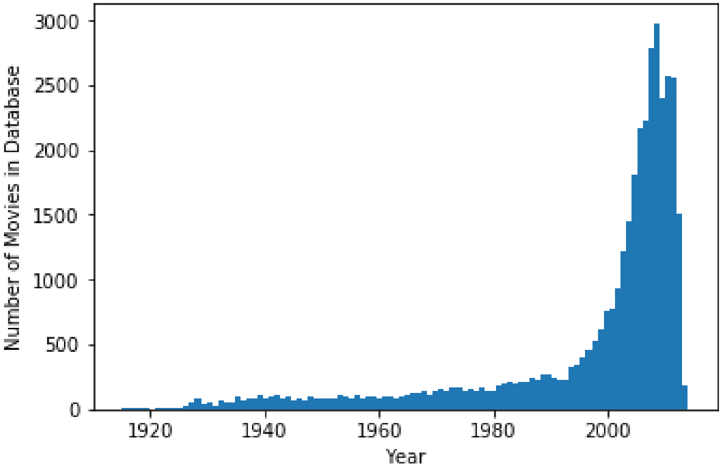
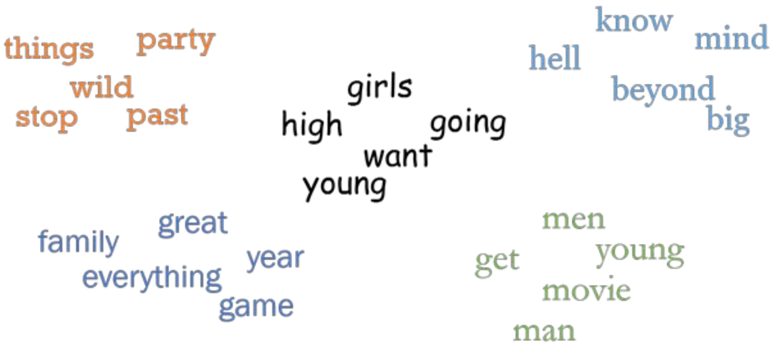
Our Challenge This Week?

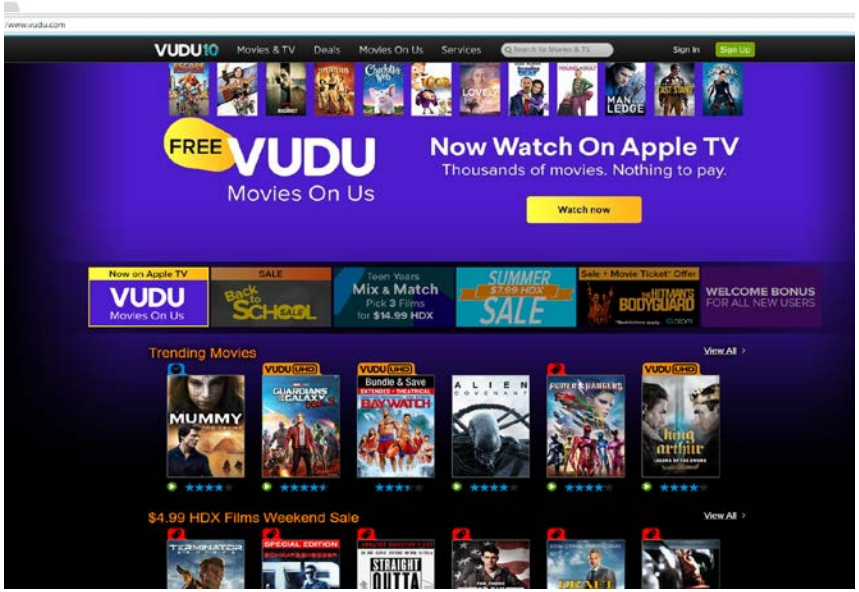
How Might We Discover Them?



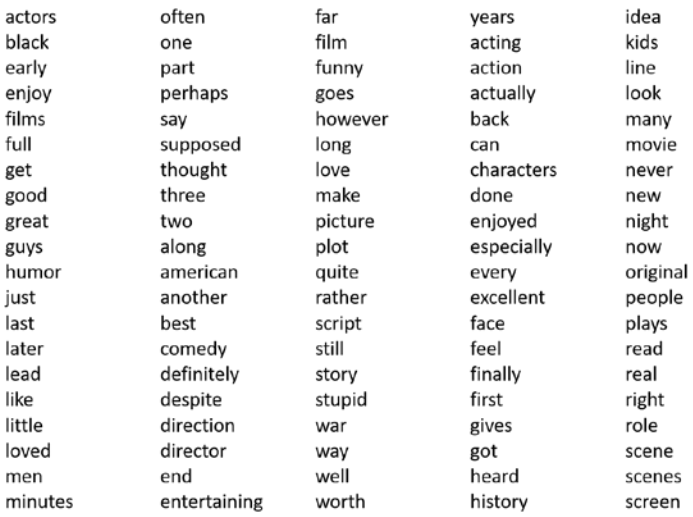


How Might We Discover Them? (cont.)





Bag of Words



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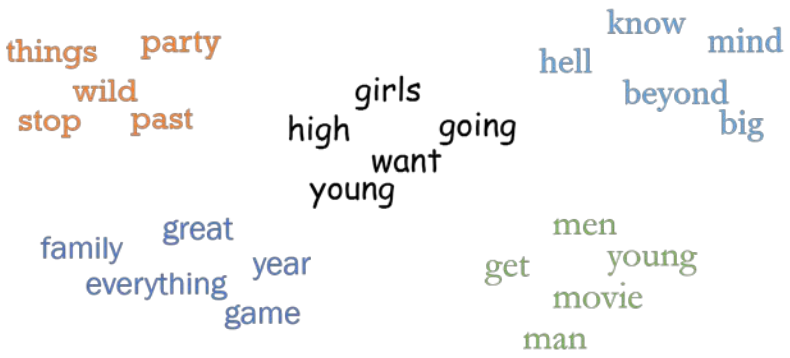
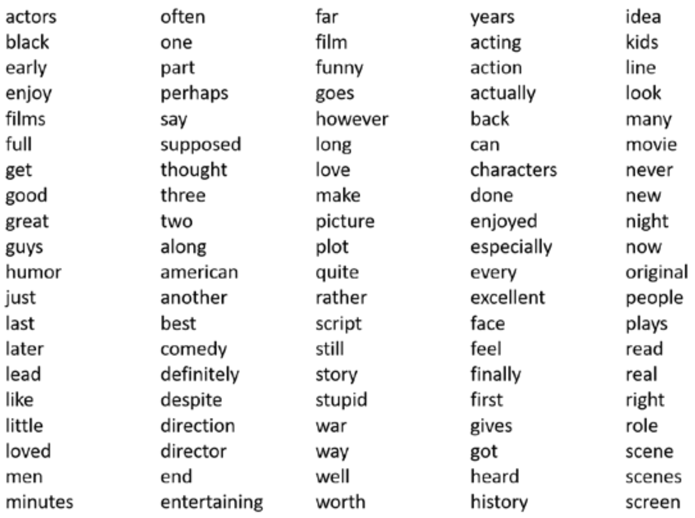


Sentiment Analysis



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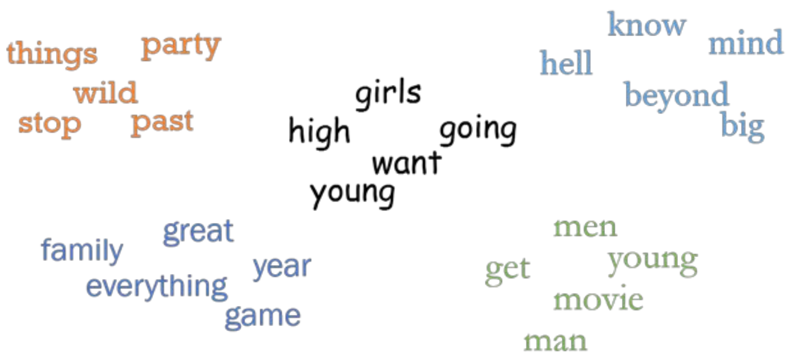
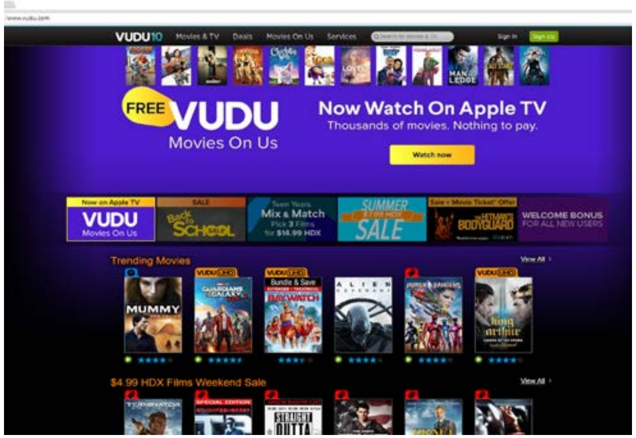
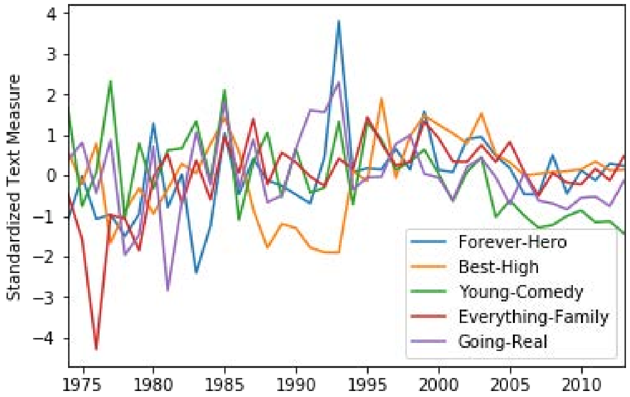


Recommendation

- Text analytics requires a move from unstructured to structured
- Some primary methods
  - Bag of words
  - Natural language processing
  - Sentiment analysis
- Text analytics gives new insight into consumer preferences





Text Processing

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Patterns in Text Data

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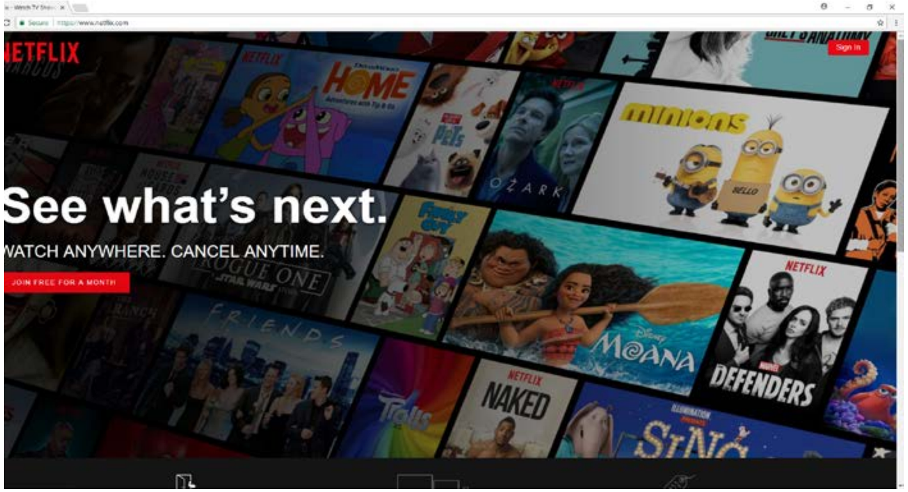
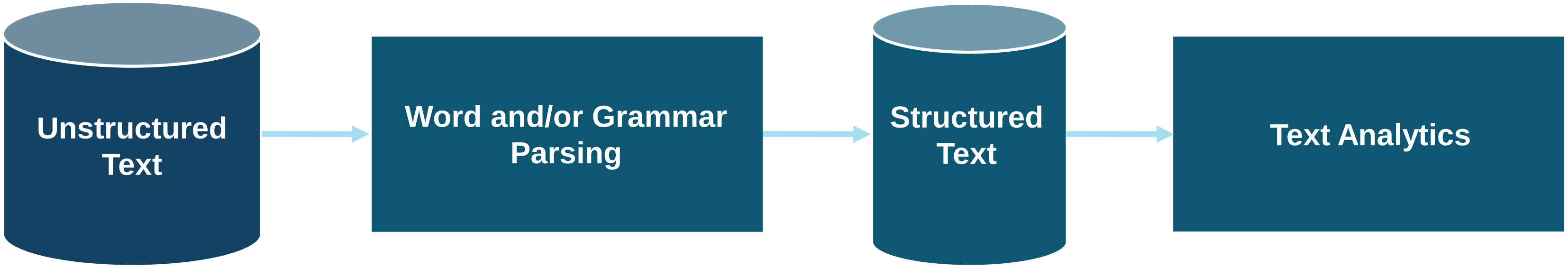


Text Processing



Source: Adapted from Miller (2005).

Term Document Matrix

Covert (2017)

You don’t get more back to the future than this wholehearted embrace of sci-fi and golden oldies nostalgia. No franchise is so gifted at exploiting the popularity of superhero movies while satirizing the genre … “Guardians of the Galaxy Vol. 2” is just right. It’s hyperbolic nonsense wrapped in the colors of a neon rainbow, bouncing from one artfully wacky scenario to the next. Here it’s sleekly futuristic, there it’s older than mud. It’s the galaxy’s silliest thrill show.

	Document		
Term	Covert	Lapin	…
future	1	0	
oldies	1	1	
movie	1	1	
galaxy	1	1	
neon	1	0	
rainbow	1	0	
battle	0	1	
families	0	1	
…			

Lapin (2017)

Swapping out yet another giant, ponderous battle for a cute creature and Oldies radio is exactly the sort of action movie send-up the genre needs right now, so it's a shame the rest of the film doesn't follow that same spirit of rule-breaking. Instead, we get straight-laced morals about families that feel like warmed-over *Fast and Furious* wisdom.

Source: Adapted from Miller (2005).

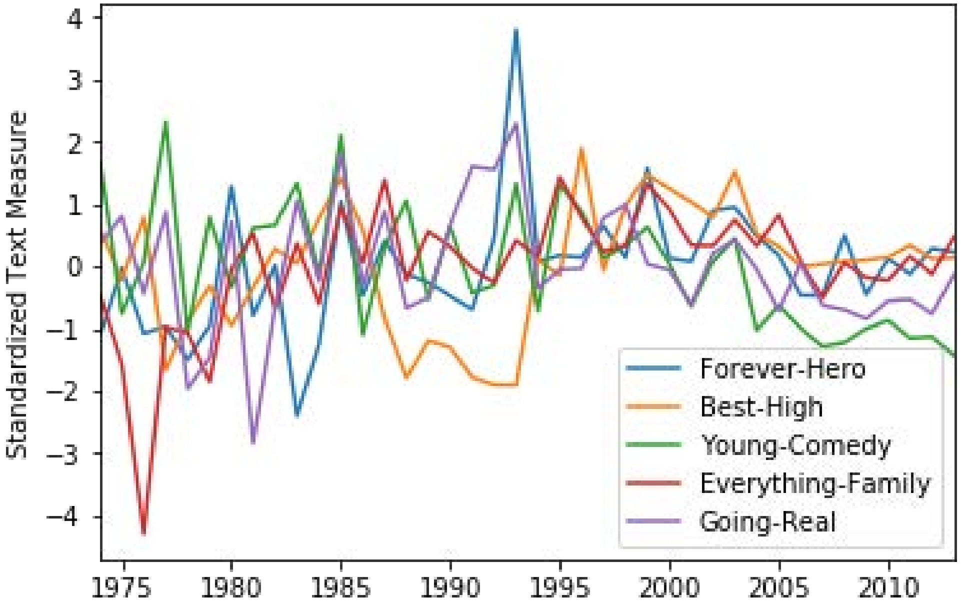
Text Analytics

Unsupervised

- No response or class
- Patterns or trends over time/population

Supervised

- Response or class
- Spam or relevant search



Foundation

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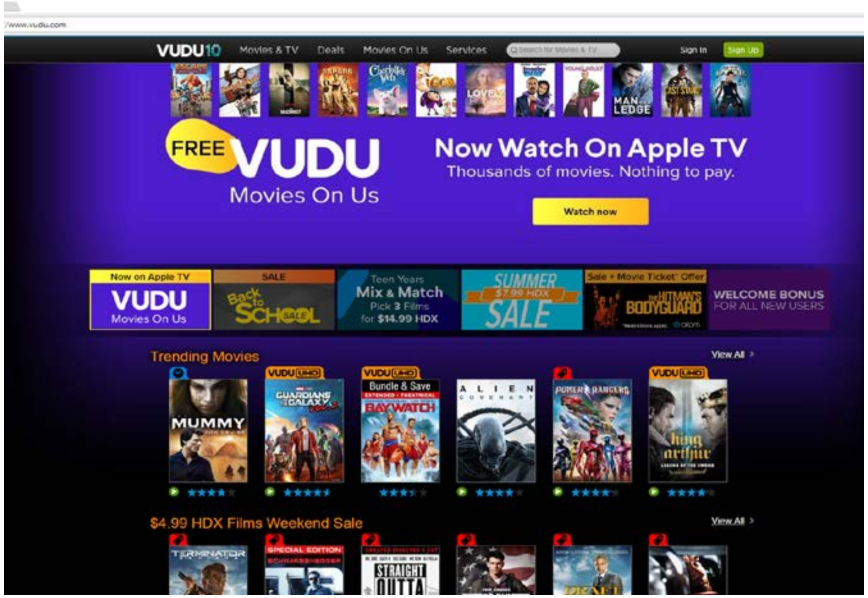
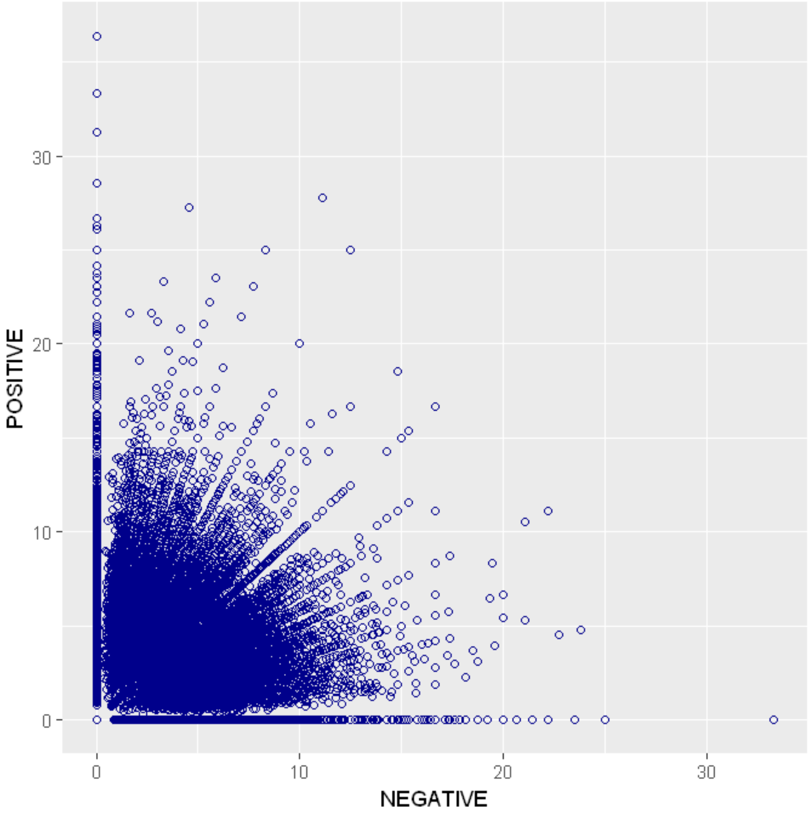
Patterns in Text Data





Sentiment Analysis

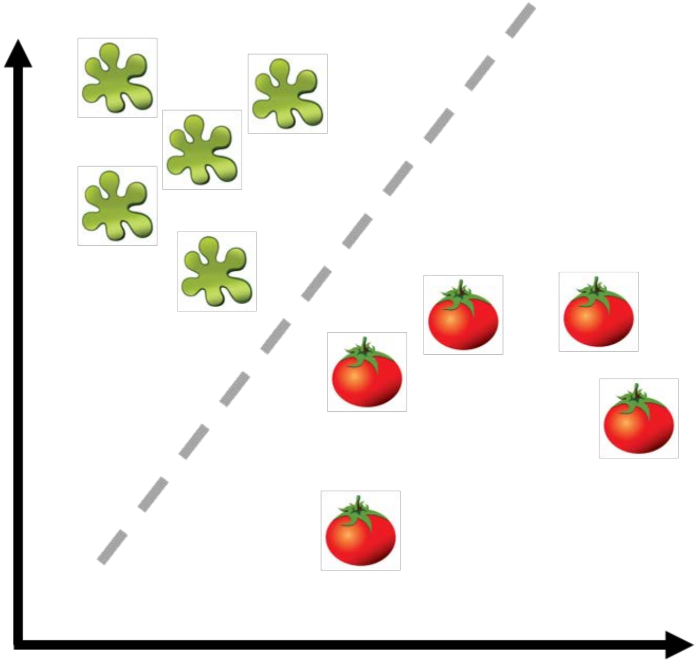
- Measurement focused
  - Positive words
  - Negative words
- Dictionary
  - Not alphabetized definitions
  - Repository of lists
  - Positive and negative words
  - Synonyms and antonyms

Simple Difference

- Compute difference scores
- Cutoff predicted on training set
- Positive minus negative scores

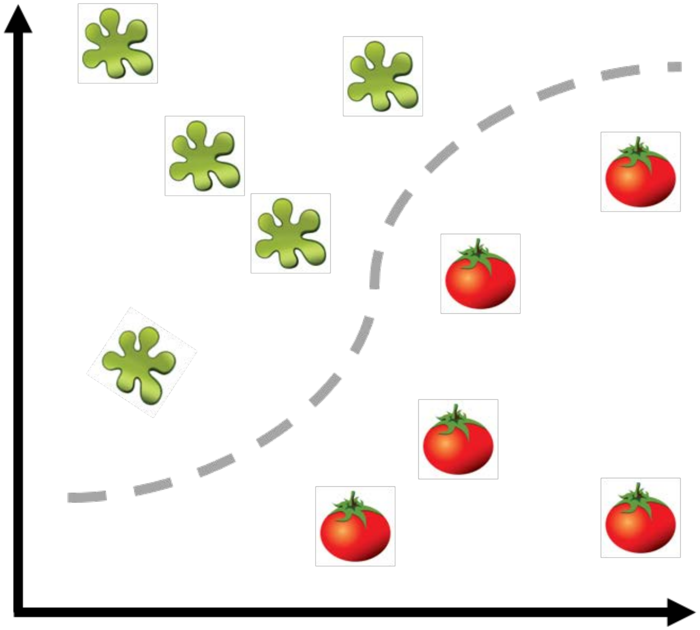
Regression Difference

- Linear regression to determine weights
- Combine positive and negative scores into a linear predictor
- Predicted rating becomes a cutoff



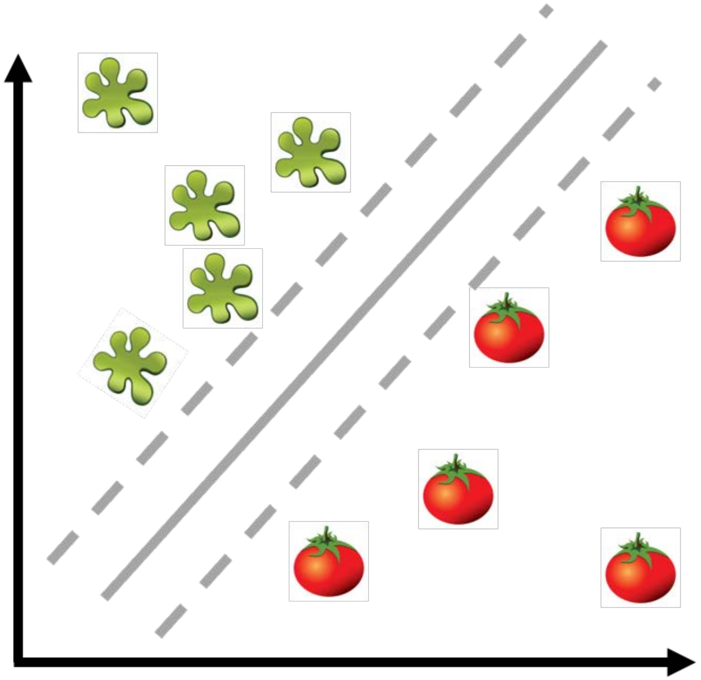
Logistic Regression

- Predicting a binary response
- Select useful predictors from sentiment words
- Weights calculated using maximum likelihood



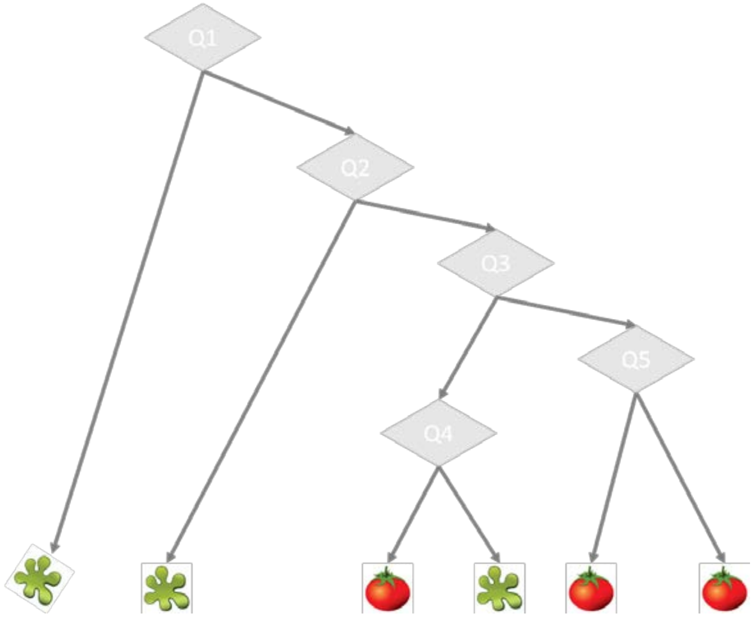
Support Vector Machines

- Effective in problems with large numbers of explanatory variables
- Classifies using a separating hyperplane
- Memory efficient



Random Forests

- Ensemble method using multiple decision trees
- Recursive partitioning on the training set
- Effective with large number of explanatory variables



Alternatives

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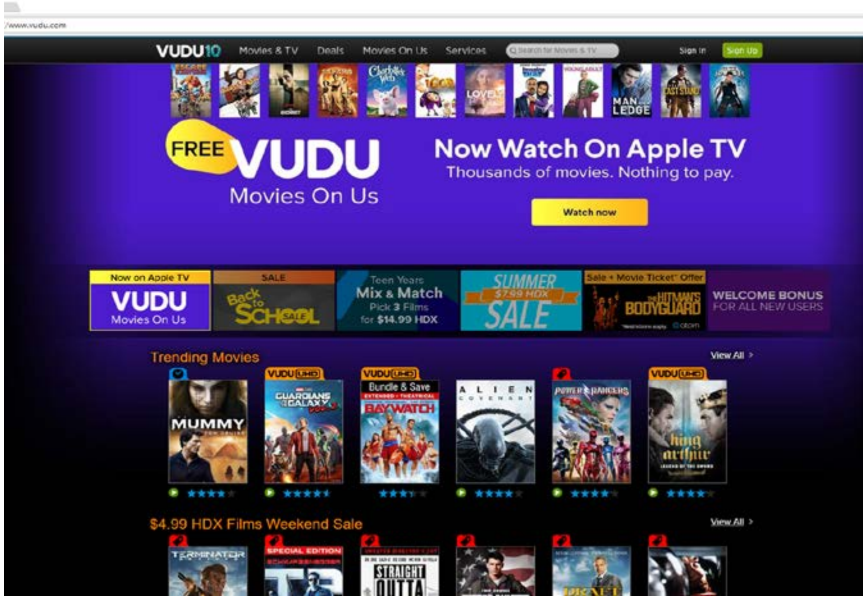
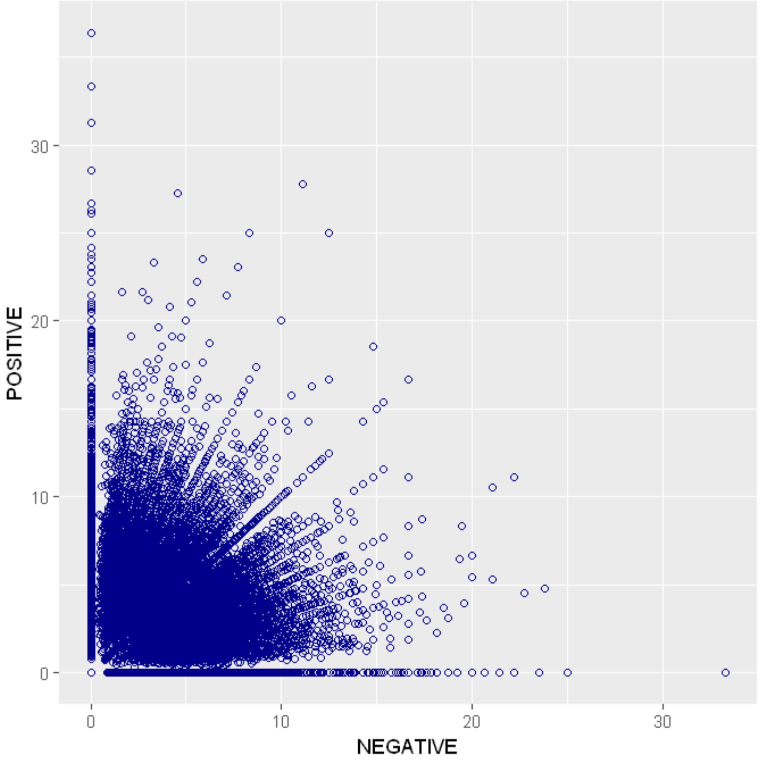
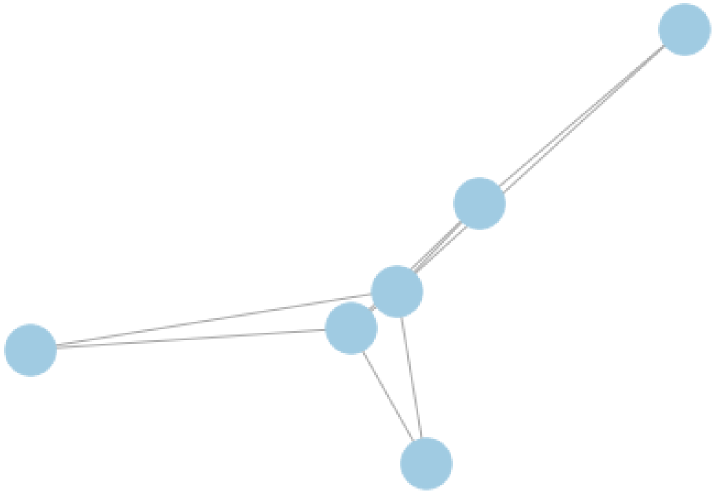
Alternatives for Text Data





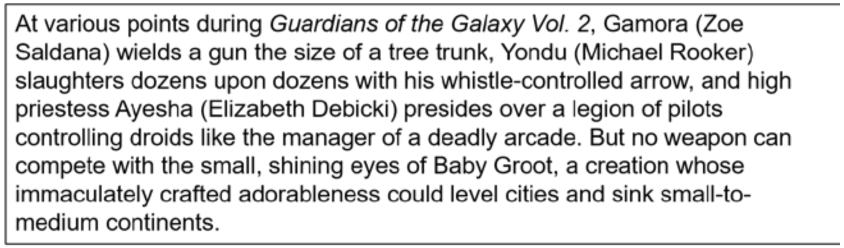
Latent Semantic Analysis

- Identify relationships between words
- Concepts within the documents
- Eliminate the noise and provide simple representation of the data



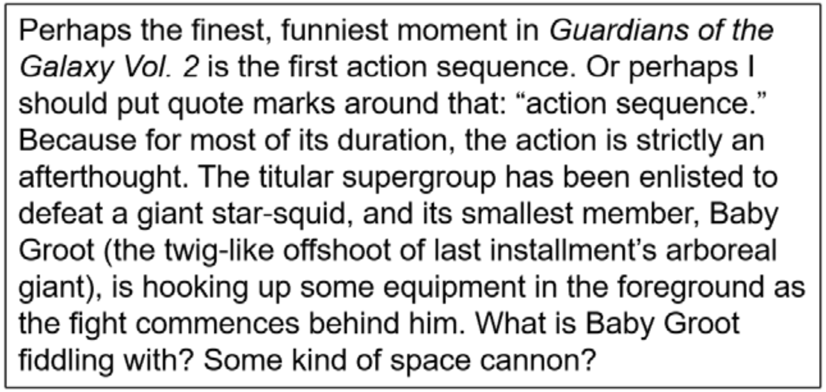
Latent Semantic Analysis (cont.)

Willmore (2017)



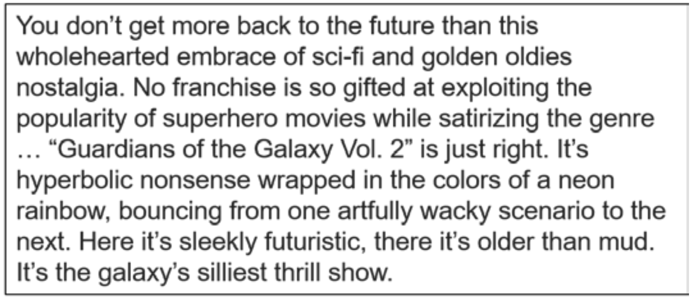
At various points during *Guardians of the Galaxy Vol. 2*, Gamora (Zoe Saldana) wields a gun the size of a tree trunk, Yondu (Michael Rooker) slaughters dozens upon dozens with his whistle-controlled arrow, and high priestess Ayesha (Elizabeth Debicki) presides over a legion of pilots controlling droids like the manager of a deadly arcade. But no weapon can compete with the small, shining eyes of Baby Groot, a creation whose immaculately crafted adorableness could level cities and sink small-to-medium continents.

Orr (2017)



Perhaps the finest, funniest moment in *Guardians of the Galaxy Vol. 2* is the first action sequence. Or perhaps I should put quote marks around that: “action sequence.” Because for most of its duration, the action is strictly an afterthought. The titular supergroup has been enlisted to defeat a giant star-squid, and its smallest member, Baby Groot (the twig-like offshoot of last installment’s arboreal giant), is hooking up some equipment in the foreground as the fight commences behind him. What is Baby Groot fiddling with? Some kind of space cannon?

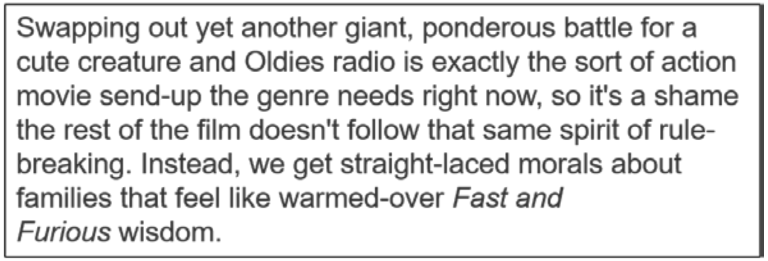
Covert (2017)



You don’t get more back to the future than this wholehearted embrace of sci-fi and golden oldies nostalgia. No franchise is so gifted at exploiting the popularity of superhero movies while satirizing the genre … “Guardians of the Galaxy Vol. 2” is just right. It’s hyperbolic nonsense wrapped in the colors of a neon rainbow, bouncing from one artfully wacky scenario to the next. Here it’s sleekly futuristic, there it’s older than mud. It’s the galaxy’s silliest thrill show.

GG2 delivers easy summer movie fare, has a message of family, stars Baby Groot, and is generally liked by reviewers.

Lapin (2017)



Swapping out yet another giant, ponderous battle for a cute creature and Oldies radio is exactly the sort of action movie send-up the genre needs right now, so it's a shame the rest of the film doesn't follow that same spirit of rule-breaking. Instead, we get straight-laced morals about families that feel like warmed-over *Fast and Furious* wisdom.

Latent Semantic Analysis (cont.)

From our term document matrix:

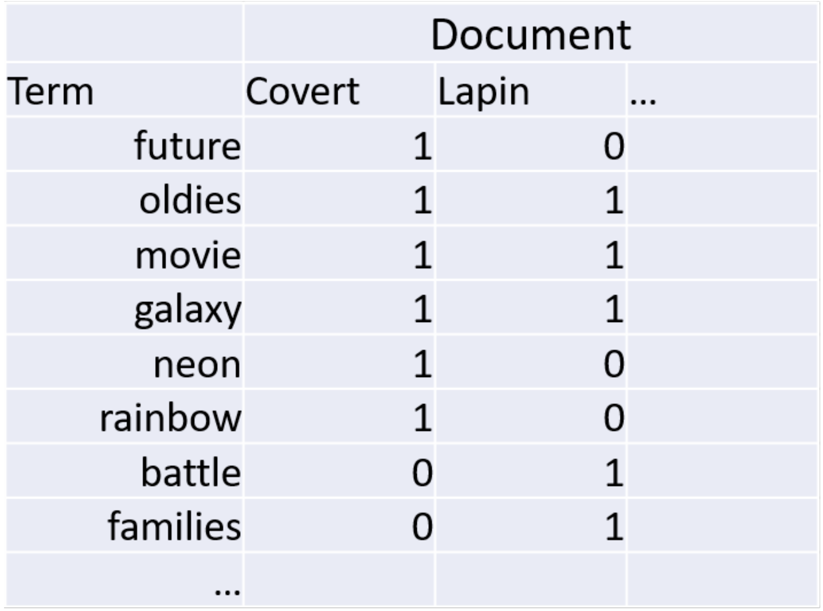
$$M = USV^T$$

M is $m \times n$

U is $m \times k$

S is $k \times k$

V is $k \times n$



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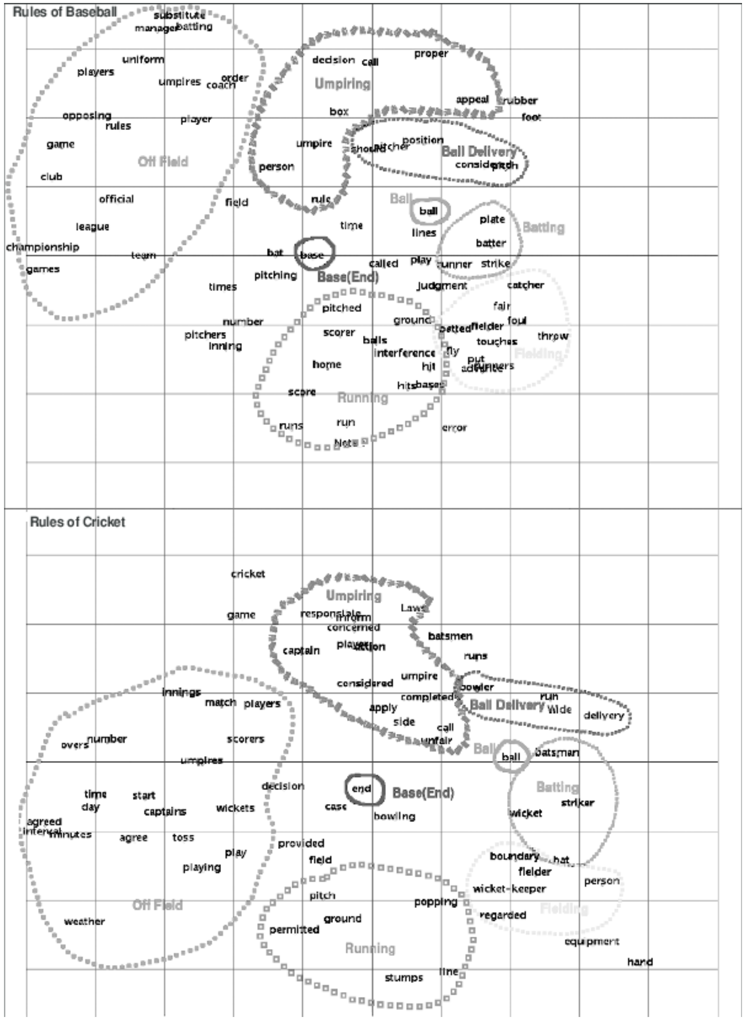
…			

Some Warnings

- The “good-bad” dimension
- Specific terms vs. latent semantic dimensions
- Relation to business outcomes and insights



Rules of Baseball
substitute
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players
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order
opposing
rules
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game
Off Field
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official
league
championship
team
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decision
call
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Umpiring
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rubber
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umpire
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pitcher
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plate
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strike
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pitchers
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score
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bases
Running
runs
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Note
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responsible
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umpire
bowler
innings
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players
apply
Ball Delivery
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overs
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scorers
unfair
Ball
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batsman
umpires
decision
end
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boundary
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person
wicket-keeper
pitch
popping
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Fielding
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permitted
equipment
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line