

Webis Talks Flash 2017

12.01.2017

Clickbait Detection

GPU Based Text-Analytics

This is Offensive Language

Essay Scoring

Argument Unit Segmentation

Web Resource for Argument Mining

Vandalism in Wikipedia

Argumentation Strategies

2017 ACM DEBS Grand Challenge

A Large-scale Analysis of the Mnemonic Password Advice

Clickbait Detection

by Kristof Komlossy, Putrasandy Dana Riawan Sebastian Schuster

**Why you should ALWAYS drink red wine
when you smoke, according to medical
report**

**This Teen Blew Everyone Out Of The
Water With Her Insane
Prom Entrance**

Definition

- A headline is considered as clickbait if its main purpose is to make the user click on the link by unnecessarily omitting crucial information, creating a curiosity gap.
- A clickbait is also present if there is an exaggerating headline which has nothing to do with the content.

Reasons

- Increase of clickbait over the last few years
- Not much existing research (yet)

Problems

- Lowers the perception and standards of journalism
- Trains reader to skim over articles

Solution

- Journalists could abandon practice
- Readers could stop rewarding clickbait

Solution

- ~~Journalists could abandon practice~~
- ~~Readers could stop rewarding clickbait~~
- give users a tool to detect clickbait content
(maybe hide it)

Process

- Searched for concise **clickbait definition**
- **Archived tweets**[more than 250,000] and related **media** of news publishers
 - **Scored after degree of clickbait** by Amazon Mechanical Turk workers
- Use certain **features of the data** to train the classifiers
- Write browser plugin

Instruction

We consider a headline as clickbait if its main purpose is to make the user click on the link by unnecessarily omitting the main information, creating a curiosity gap. It is also clickbait if there is an exaggerating headline which has nothing to do with the content.

Examples of clickbait:

- "The secrets behind 'Something Rotten's' biggest number": *Strong clickbait*
- "China's fishermen explain why they think the sea is theirs": *Medium clickbait*
- "Catching up with Manon Rhéaume, who inspired many during her historic appearances as a @TBLightning goalie in the 90s": *Weak clickbait*
- "Gronk went bald for the kids! The Patriots tight end shaved his head for a cancer charity": *Not clickbait*

Based on those definitions, decide how strong of a clickbait the headlines below are.

Polar bears 'have started eating dolphins due to climate change' [Link](#)



strong clickbait

medium clickbait

weak clickbait

no clickbait

'Spy from suburbia': Pensioner's secret life revealed after bomb scare [Link](#)



Log Browser

Corpus [New Corpus](#)

Number Of Selected

Tweets: 192.416

 3502 of
7.697

Filters

[Reset Filters](#)

filter by tag

[Filter User By Tag](#)

filter by content

start date

 dd.mm.YYYY

end date

 dd.mm.YYYY

All Users

 BBC
News
(UK)

 abc

 abcnews

 bbcworld

 billboard

	Created At	ID	Tweet	Media	User
<input type="checkbox"/>	Nov. 29, 2016, 12:57 p.m.	803568513583616000	COMING UP ON @GMA: Tennessee wildfires burn 100 homes, force thousands to flee. https://t.co/52M4kOvX5r	expand	abc
<input type="checkbox"/>	Nov. 29, 2016, 12:56 p.m.	803568213321617408	In a remote Tibetan valley, Buddhists are being forced out of the area. https://t.co/KPG2SSIL4Y https://t.co/IGFBwpS39a	expand	nytimesworld
					
<input type="checkbox"/>	Nov. 29, 2016, 12:55 p.m.	803568033172221952	The Edge of Seventeen review – Hailee Steinfeld has a coming-out ball https://t.co/3sbJwgussZ	expand	guardian
<input type="checkbox"/>	Nov. 29, 2016, 12:54 p.m.	803567817798930432	Why have streets in Sudan's capital been deserted? https://t.co/wgDAFMMjje	expand	bbcworld
<input type="checkbox"/>	Nov. 29, 2016, 12:54 p.m.	803567750849380353	UPDATE: "May God be with our athletes," Brazilian soccer team says after players are among 76 killed in jet crash... https://t.co/yOpABKOc1M	expand	nbcnews
<input type="checkbox"/>	Nov. 29, 2016, 12:52 p.m.	803567190435733504	Samsung tries to appease investors but delays big changes https://t.co/RSuVMNs7rn	expand	wsj
<input type="checkbox"/>	Nov. 29, 2016, 12:51 p.m.	803566931856990208	Moonlight sweeps Gotham awards, with acting honours for Isabelle Huppert and Casey Affleck https://t.co/BhAypJ3dyg	expand	guardian
<input type="checkbox"/>	Nov. 29, 2016, 12:50 p.m.	803566725090463744	The #DelhiUniversity student bludgeoned his elder sibling to #death with a dumbbell at their flat https://t.co/tiBGWrHMMB	expand	indiatimes

Sources

<http://www.dailymail.co.uk/health/article-3939616/Why-drink-red-wine-smoke-according-medical-report.html>

<https://www.buzzfeed.com/stephaniemcneal/people-are-losing-their-minds-over-this-teens-insanely-over>

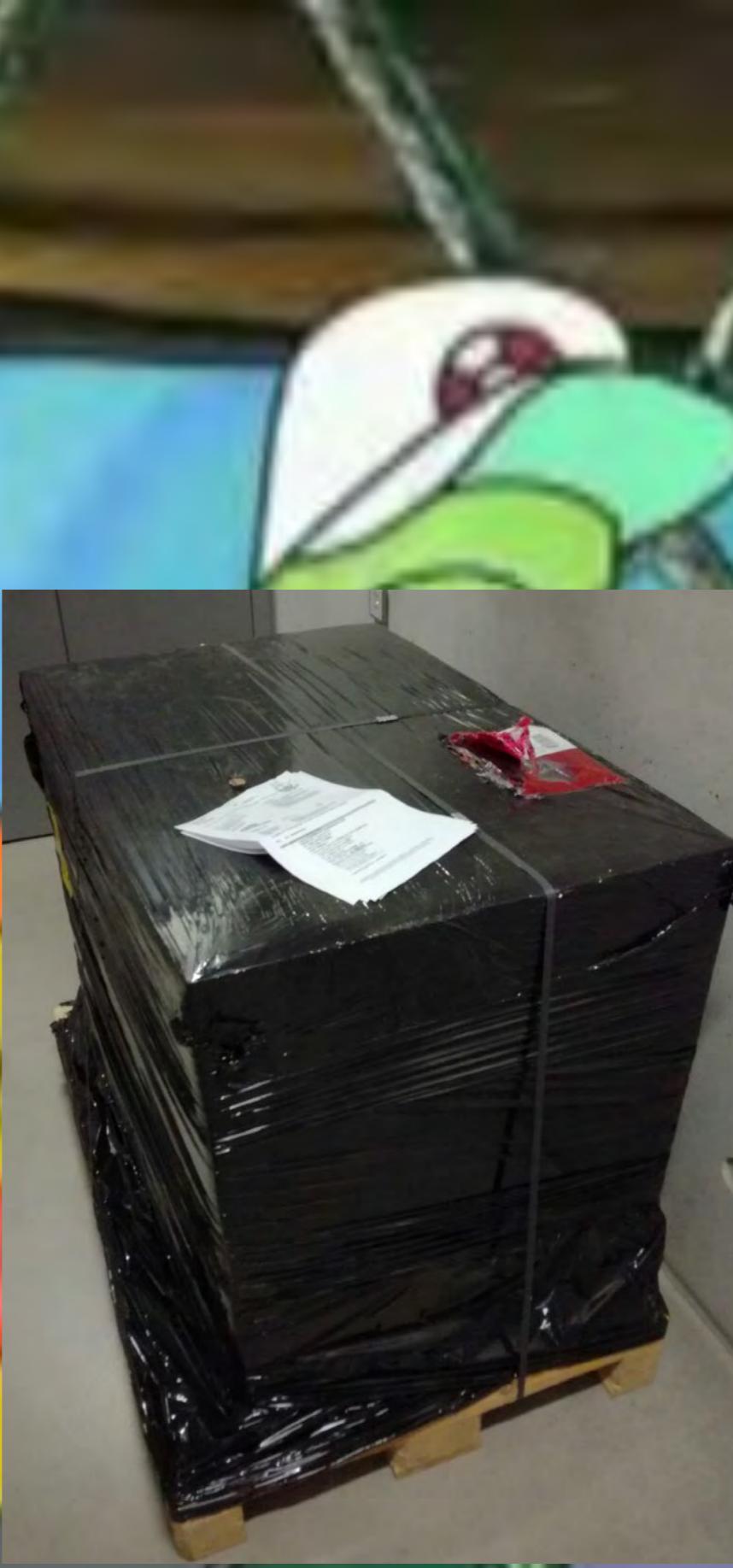
GPU Based Text- Analytics

André Karge
andre.karge@uni-weimar.de

Benedikt S. Vogler
benedikt.vogler@uni-weimar.de

Setup











Three times

```
1 [|||||] 89.5% 9 [|||||] 91.3% 17 [|||||] 90.1% 25 [|||||] 88.9%  
2 [|||||] 91.6% 10 [|||||] 92.8% 18 [|||||] 87.4% 26 [|||||] 91.6%  
3 [|||||] 90.1% 11 [|||||] 93.4% 19 [|||||] 89.4% 27 [|||||] 92.8%  
4 [|||||] 90.7% 12 [|||||] 94.7% 20 [|||||] 89.6% 28 [|||||] 87.9%  
5 [|||||] 90.1% 13 [|||||] 92.7% 21 [|||||] 87.6% 29 [|||||] 90.8%  
6 [|||||] 88.2% 14 [|||||] 92.8% 22 [|||||] 94.7% 30 [|||||] 89.5%  
7 [|||||] 91.6% 15 [|||||] 90.3% 23 [|||||] 89.7% 31 [|||||] 91.6%  
8 [|||||] 91.5% 16 [|||||] 90.7% 24 [|||||] 90.1% 32 [|||||] 91.4%  
Mem[|||||]  
Swp[  
      5.16G/1.48T] Tasks: 196, 1188 thr; 240 running  
      0K/26.3G] Load average: 114.94 106.61 68.72  
                          Uptime: 26 days, 00:37:04
```

- 1,5 TB RAM
- 8x GeForce GTX 1080 (8113MiB)
- 2 Intel Xeon CPU:
- SSDs

HDD LAYOUT									
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9



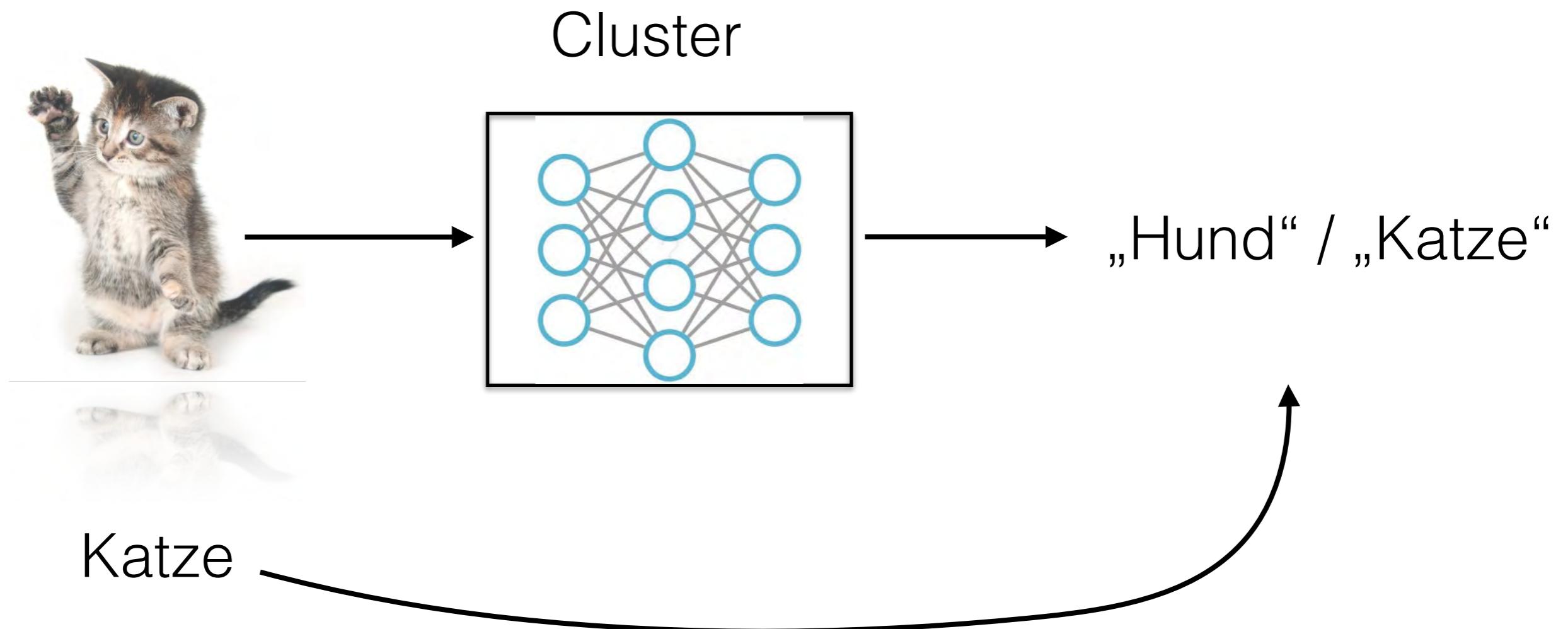
Steps

- Install Software
- Health Checks
- Train own Deep Learning Networks
- Improve

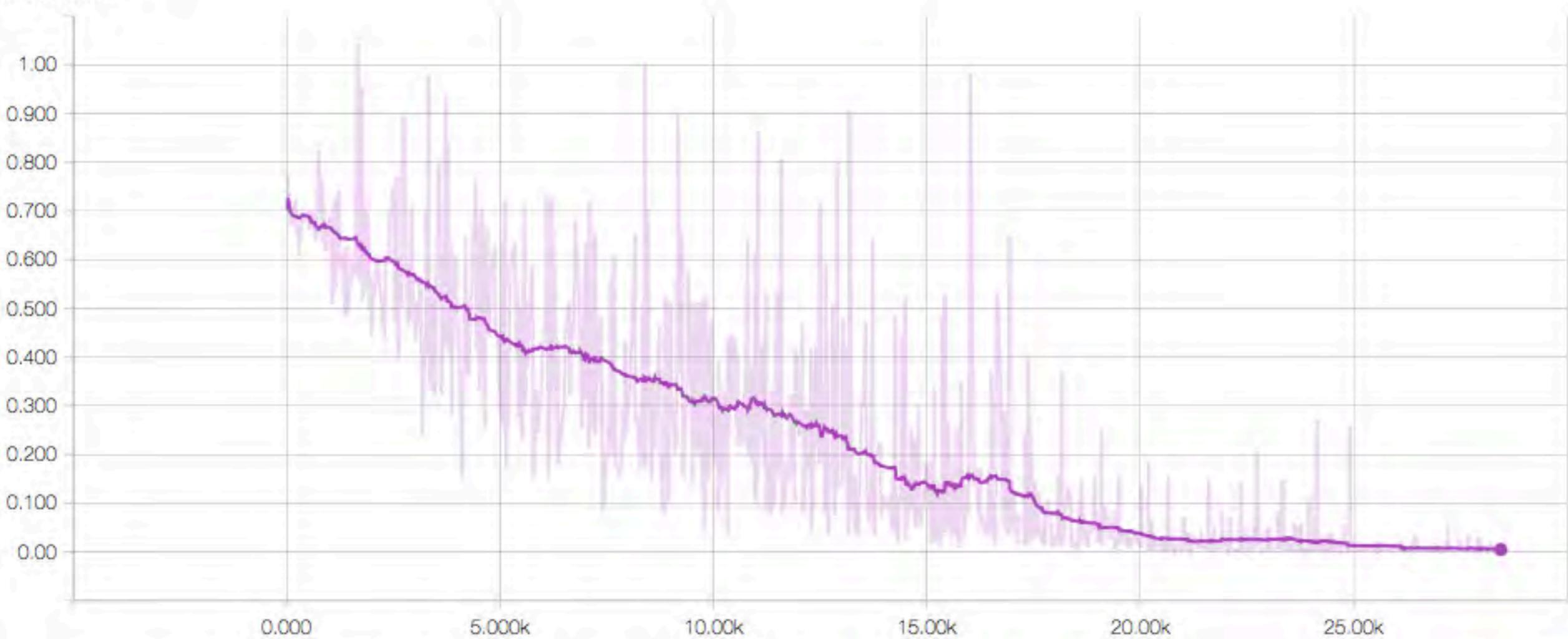




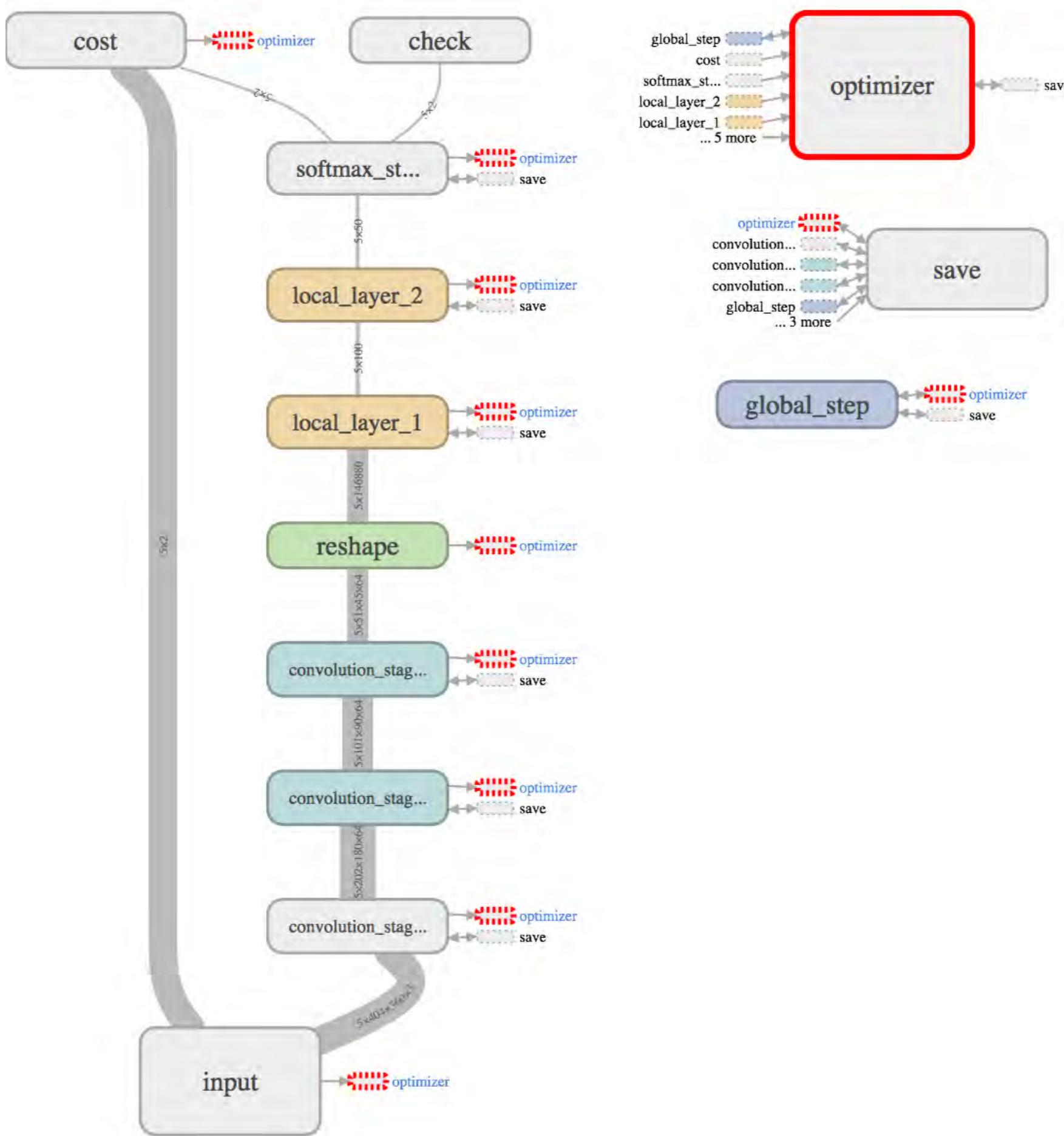
Supervised Learning



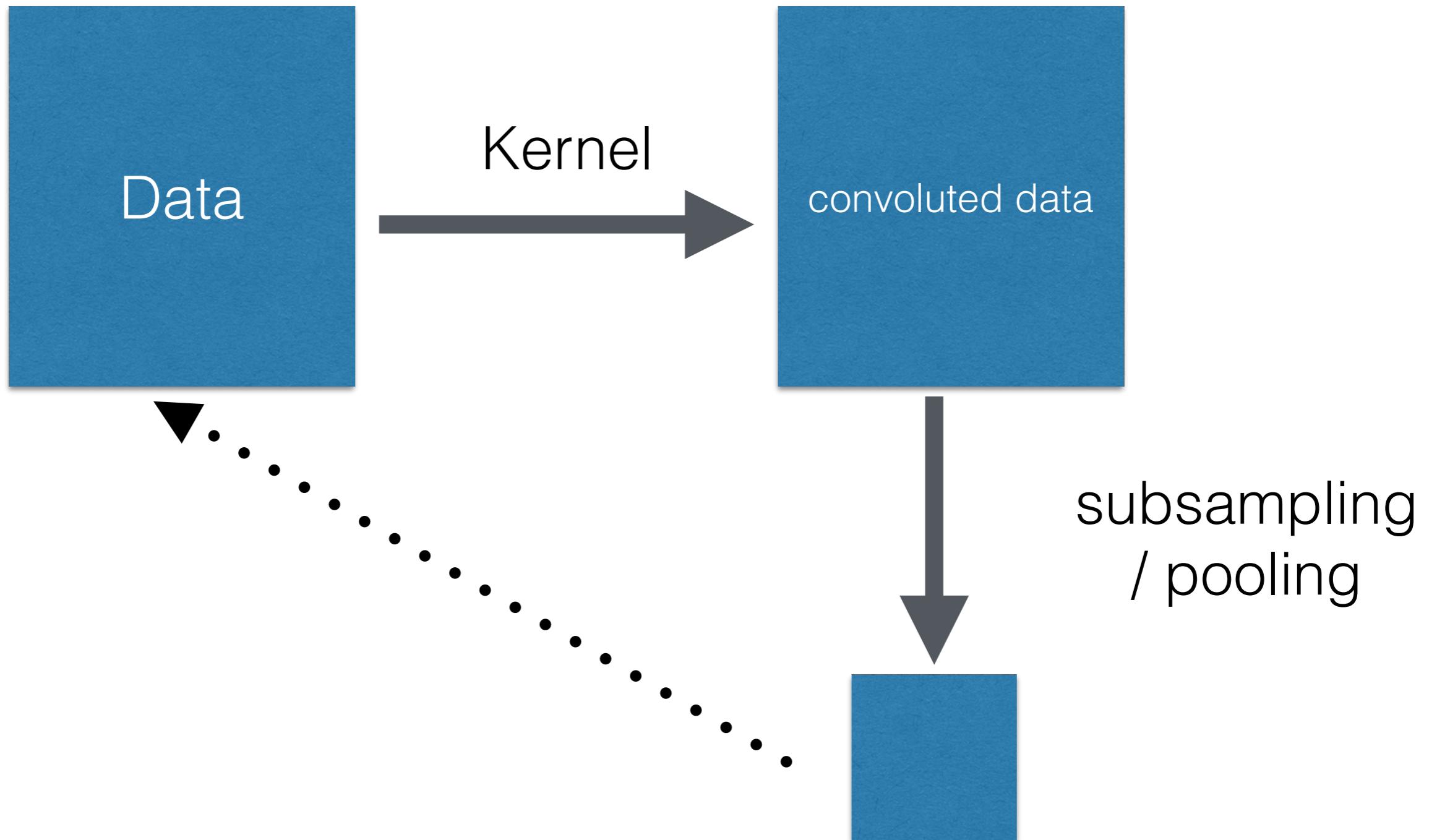
cost_function



geglättet Kosten über Epochen



Convolution



„Neural networks are engineering, they are not applied mathematics [...]“

–S. Matthews, review of machine learning book

**This is offensive language!!
Stop attacking me**

Negin Yaghoubisharif, Masoud Allahyari,
Patrick Saad, Christian Paffrath, Philipp Rudloff

Supervisor: Khalid Al-Khatib

Introduction

Donald J. Trump
@realDonaldTrump

[@caaataclys](#) Little Jon Stewart(?) Is a pussy, he
would be hopeless in a debate with me!
07:22 am - 11 Mai 2013
(<https://twitter.com/realDonaldTrump/status/333089735570493440>)

The New York Times



The Washington Post



You Tube

the guardian

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Csibe vor 3 Monaten

Kill all Migrante!!!!

Antworten • 101



The New York Times



The Washington Post



YouTube

the guardian

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[Csibe](#) vor 3 Monaten

Kill all Migrante!!!!

Antworten • 101



[–] [GMUwhat1234](#) 5 points 1 year ago

god fucking feminists i hate those cunts

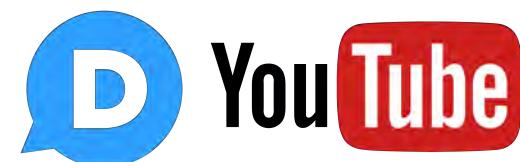
[permalink](#) [embed](#)

This is offensive language!! Stop attacking me

The New York Times



The Washington Post



the guardian

Bauhaus-Universität Weimar – WS15/16

Introduction

Donald J. Trump

@
@
W
07
(h
)

CP
@realCPPP

I heard someone say “All russians are drunk
bastards” on the bus today.

11:50 am - 8 January 2017
(made up example 1)

The New York Times

be

permitted content

Introduction

Donald J. Trump

@
@
W
07
(h
)

CP
@realCPPP

I heard someone say “All russians are drunk
bastards” on the bus today.

11:50 am - 8 January 2017
(made up example 1)

The New York Times

t

be

PD

@realPhifeDog

Those sick dogs!

25:61 am - 13 January 2017
(made up example 2)

Political Satire

Overview

Goal

- **Annotated dataset** for offensive language studies
- **Classifier** with good prediction accuracy, even for new datasets

Overview

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- **Annotated dataset** for offensive language studies
- **Classifier** with good prediction accuracy, even for new datasets

Input

- **Unannotated dataset:** e.g. Twitter tweets

Overview

Goal

- **Annotated dataset** for offensive language studies
- **Classifier** with good prediction accuracy, even for new datasets

Input

- **Unannotated dataset:** e.g. Twitter tweets

Process

- Data annotation: **crowdsourced** instead of expert
- Machine learning method: **active** instead of passive **learning**
- Classification: **Offensive, Other**

Process

Crowdsourcing

- Amazon Mechanical Turk (AMT)
- Why
 - Annotate a large amount of data (HITs)
 - Scalable
 - Cost



Process

Crowdsourcing

- Amazon Mechanical Turk (AMT)
- Why
 - Annotate a large amount of data (HITs)
 - Scalable
 - Cost

Example with Twitter dataset

- Send tweets for annotation as *Human Intelligence Tasks* (HITs)
- Receive annotated HITs



The screenshot shows a web interface for annotation tasks. At the top, there are tabs for "HITS" and "beta". Below the tabs, the title "Offensive Language HITs" is displayed. A note below the title reads: "Please make sure you have thoroughly read the instructions and examples above. A quality check will take place on your submitted answers, so please take your time. Submission will be rejected. Thank you for helping us out and happy slaving (that's offensive)!"

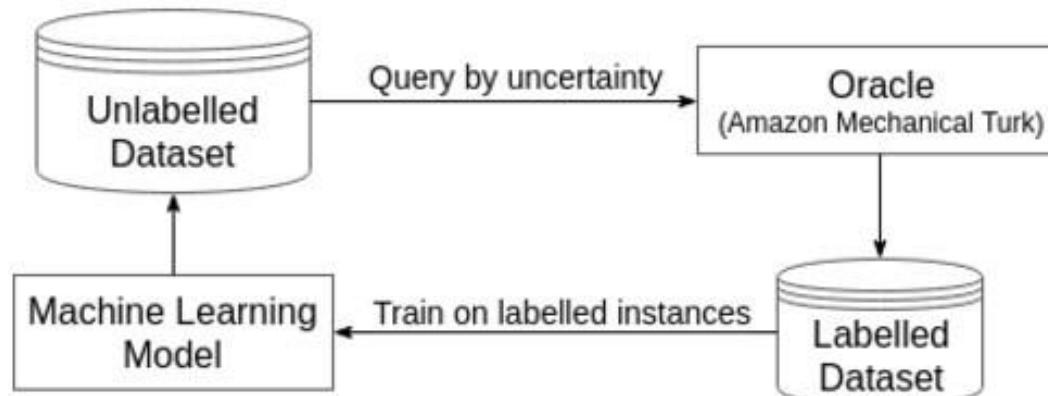
The interface consists of a list of statements for annotation. Each statement is followed by two radio buttons: "Offensive" and "Other".

- It is a world run by the Zionist Jewish Influence and Race Tainting Paedophiles that are only here to rape our heritage and destroy the qualities that make us White People great.
Offensive Other
- Perhaps those Mexicans were just hunting dogs.
Offensive Other
- Fuck that shit, I've had enough!
Offensive Other
- Remember that republican meme that was going around after Obama was elected, W saying, "Miss me yet?" Um, yeah, now I actually do.
Offensive Other
- Let me do the talking; people listen to men
Offensive Other

At the bottom of the interface is a "Submit" button.

Process

Active Learning



Applications

- Browser plugin to hide/mark offensive content
- Automatically flag content for moderation
 - Wordpress
 - All sites that have user-generated content
- Use degree of offensiveness as quality measurement for posts
 - Numerical value that shows an offensiveness score for every post

Essay Scoring

Patrick Saad, Yamen Ajjour, Henning Wachsmuth, Khalid Al-Khatib

WS15-16 project | HIWI in 2016

HIWI supervisors: Khalid Al-Khatib, Henning Wachsmuth

Essay Scoring

The goal is to ...

improve the efficiency of large-scale essay scoring

- > International Corpus of Learner English (ICLE) (Granger et al., 2009)
- > 10 prompt topics

Essay Scoring

What kind of score

Score between 1 to 4 regarding a specific **dimension**

- > Argument Strength (*Persing et al., 2015*)
- > Thesis Clarity (*Persing et al., 2013*)

more examples

- > Organization
- > Coherence

Essay Scoring

Technical

What we used

- > Apache UIMA
- > JAVA 8
- > Tomcat 8

Features

- > POS (1-5)
- > Token N-grams (1-3)
- > Sentiment Analysis
- > Argumentative Discourse Units
- > Document Foundness

Results

	Persing et al.	Patrick et Yamen
Argument Strength	0.244	0.2251
Thesis Clarity	0.369	0.437

Essay Scoring

Online demo

<http://webis16.medien.uni-weimar.de/essay-scoring>

Bauhaus-Universität Weimar

Media Faculty

Webis

Argument Unit Segmentation

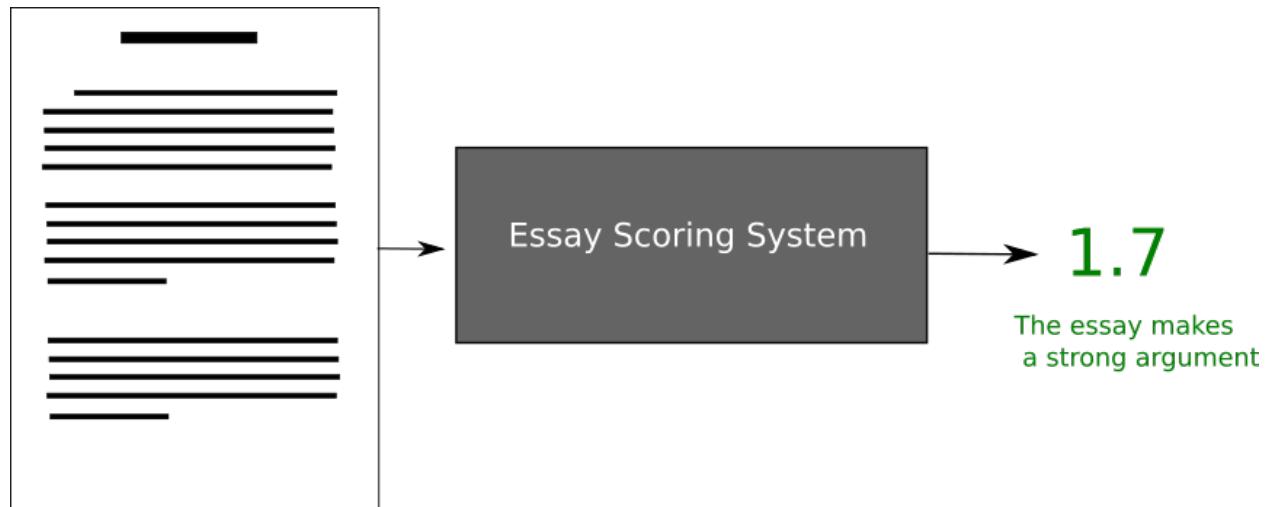
By: Yamen Ajjour (HIWI)

Supervisor : Johannes Kiesel

Argument Unit Segmentation

Motivation

Essay Scoring Systems



Argument Unit Segmentation Motivation

Argument Search Engine

There are practical problems with banning abortions

[show attacking arguments](#) [show supporting arguments](#) Attack

There can be medical reasons for terminating a pregnancy

[show attacking arguments](#) [show supporting arguments](#) Attack

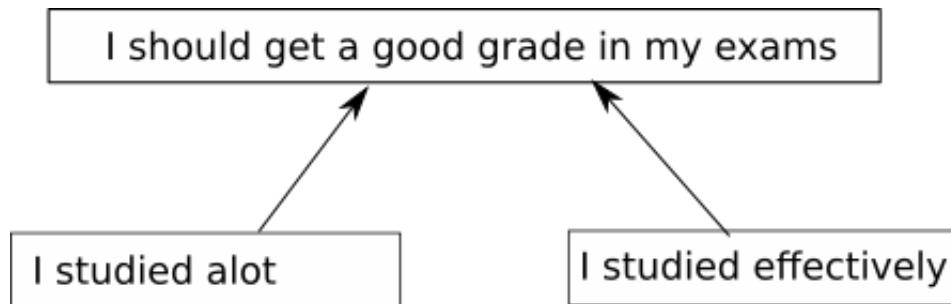
Legalizing abortion leads to irresponsible sexual behaviour

[show attacking arguments](#) [show supporting arguments](#) Support

Argument Unit Segmentation

What is an argument ?

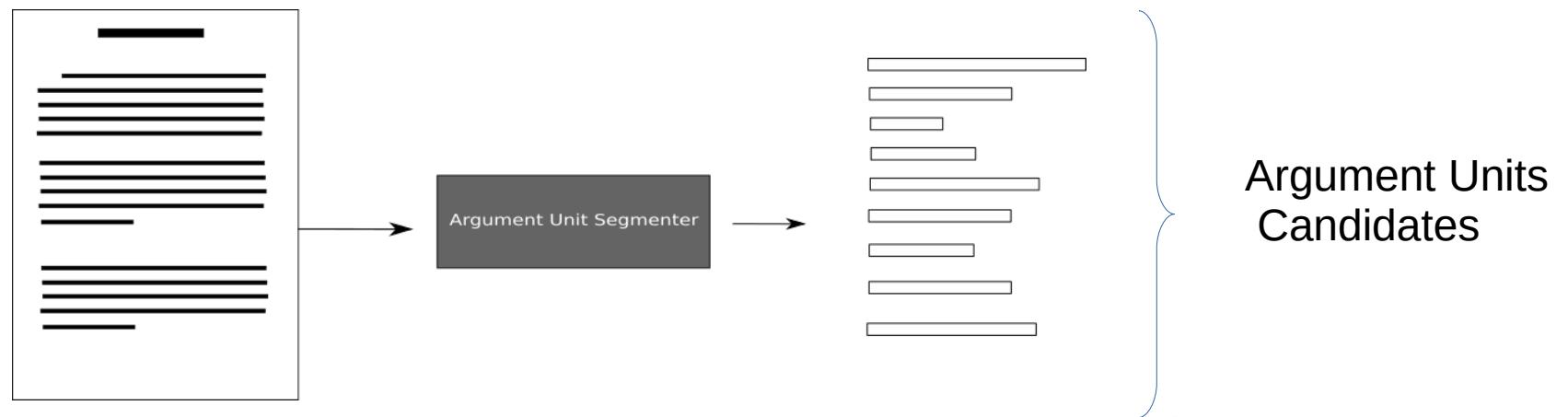
An argument is a set of argument units (a conclusion and set of premises)



Argument Unit Segmentation

Problem Definition

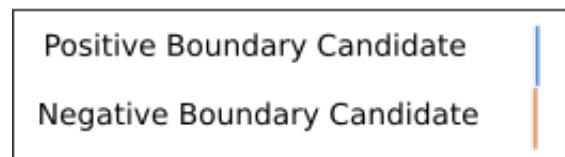
Given a plain text how to split it into text segments that cover argument units ?



Argument Unit Segmentation Approach

- **Conventional:** An argument unit spans a grammatical unit, such as clause or sentence
- **Training a classifier to distinguish the boundaries of an argument unit**
 - An input instance: Each two consecutive words is a boundary candidate
 - Features :
 - Is the boundary candidate at the start of a clause
 - Is the boundary candidate after a comma
 - Is the boundary candidate after a connective

I|should|pass|the|exam|because||I|studied|alot|and||I|studied|effectively. |



Hiwi Work: Web Resources for Argument Mining

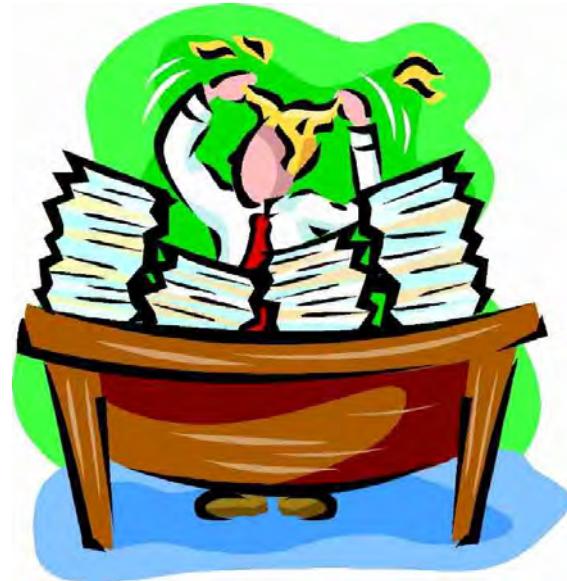
by Kevin Lang and Jakob Herpel

Motivation

We want to develop a system to detect arguments.

To improve...

- Search Engines
- Dialog Systems
- Writing Assistant Applications



Solution: Machine Learning!

- Problem: require labeled dataset
(manual labeling very difficult and expensive)
- Solution: automatic creation of labeled dataset for argument mining

How? Finding appropriate web resources and filter them automatically!



ClueWeb12

“Classifying Arguments by Scheme” by Feng and Hirst, 2011

- *Argument from example*
- *Argument from cause to effect*
- *Practical reasoning*
- **Argument from consequences**
- *Argument from verbal classification*



Consequences in ClueWeb12

- How to extract consequences:
 - lexical indicators, sentiment analysis, relatedness to good/bad concepts
- We use:
 - regular expressions, sentiment analysis tools, word2vec



Wiki Talks



WIKIPEDIA
The Free Encyclopedia

Article Talk



Not logged in Talk Contributions Create account Log in

Read Edit View history

Search Wikipedia



List of lists of lists

From Wikipedia, the free encyclopedia

This is a dynamic list and may never be able to satisfy particular standards for completeness. You can help by expanding it with reliably sourced entries.



This is a list of articles that are lists of list articles on the English Wikipedia. In other words, each of the articles linked here is an index to multiple lists on a topic. Some of the linked articles are themselves lists of lists of lists.

Contents [hide]

- 1 General reference
- 2 Culture and the arts
 - 2.1 Literature
 - 2.2 Art and the arts
 - 2.2.1 Performing arts
 - 2.2.2 Visual arts
 - 2.3 Entertainment and recreation
 - 2.3.1 Games
 - 2.3.2 Sports
 - 2.4 Food and drink
 - 2.5 Mass media
- 3 Geography and places
 - 3.1 Natural geographical features
 - 3.2 Countries and regions
 - 3.3 Places
 - 3.3.1 Settlements
- 4 Mathematics and logic
- 5 Natural and physical sciences
 - 5.1 Biology
 - 5.2 Physical sciences
- 6 People
- 7 Religion and belief systems
- 8 Society and social sciences
 - 8.1 Linguistics
 - 8.2 Social institutions
 - 8.2.1 Infrastructure
 - 8.2.2 Economy and business
 - 8.2.3 Education

Main page

Contents

Featured content

Current events

Random article

Donate to Wikipedia

Wikipedia store

Interaction

Help

About Wikipedia

Community portal

Recent changes

Contact page

Tools

What links here

Related changes

Upload file

Special pages

Permanent link

Page information

Wikidata item

Cite this page

Print/export

Create a book

Download as PDF

Printable version

Languages



العربية

Bân-lâm-gú

Български

Brezhoneg

فارسی

Føroyskt

Français

Frysk

Hrvatski

Comment Tags

Requested move 17 September 2016 [edit]

The following is a closed discussion of a requested move. Please do not modify it. Subsequent comments should be made in a new section on the talk page. Editors desiring to contest the closing decision should consider a move review. No further edits should be made to this section.

The result of the move request was: **not moved**. (non-admin closure) [GeoffreyT2000](#) (talk, contribs) 19:55, 24 September 2016 (UTC)

[List of lists of lists](#) → [Wikipedia:List of lists of lists](#) – Belongs in project space. [KATMAKROFAN](#) (talk) 16:18, 17 September 2016 (UTC)

- **Oppose** - Maybe all navigational lists should be moved to projectspace, but there's no reason to move one and leave e.g. all of the lists of lists this list lists, which are also purely navigational. — [Rhododendrites](#) talk 14:54, 18 September 2016 (UTC)

What has changed since the previous request last January which was most participates opposed?--64.229.164.105 (talk) 03:26, 19 September 2016 (UTC)

- **Oppose**. Navigates to, serves, mainspace articles, and therefore belongs in mainspace. --[SmokeyJoe](#) (talk) 03:57, 19 September 2016 (UTC)

Portals also "navigate to (and) serve mainspace articles", but they have their own namespace. [KATMAKROFAN](#) (talk) 14:15, 23 September 2016 (UTC)

The above discussion is preserved as an archive of a requested move. Please do not modify it. Subsequent comments should be made in a new section on this talk page or in a move review. No further edits should be made to this section.

Proposal: A list of lists that don't contain themselves. [edit]

I cannot figure out if this type of simple list should contain itself. Any suggestions? [NevilleDNZ](#) (talk) 03:42, 8 November 2016 (UTC)

Suggestion: Russell's paradox --[mfb](#) (talk) 19:50, 5 January 2017 (UTC)

There is [List of lists that do not contain themselves](#). – [Uanfala](#) (talk) 20:25, 5 January 2017 (UTC)

Rename to "Lists of lists" [edit]

Would be less confusing. [Xeoxer](#) (talk) 18:56, 12 November 2016 (UTC)

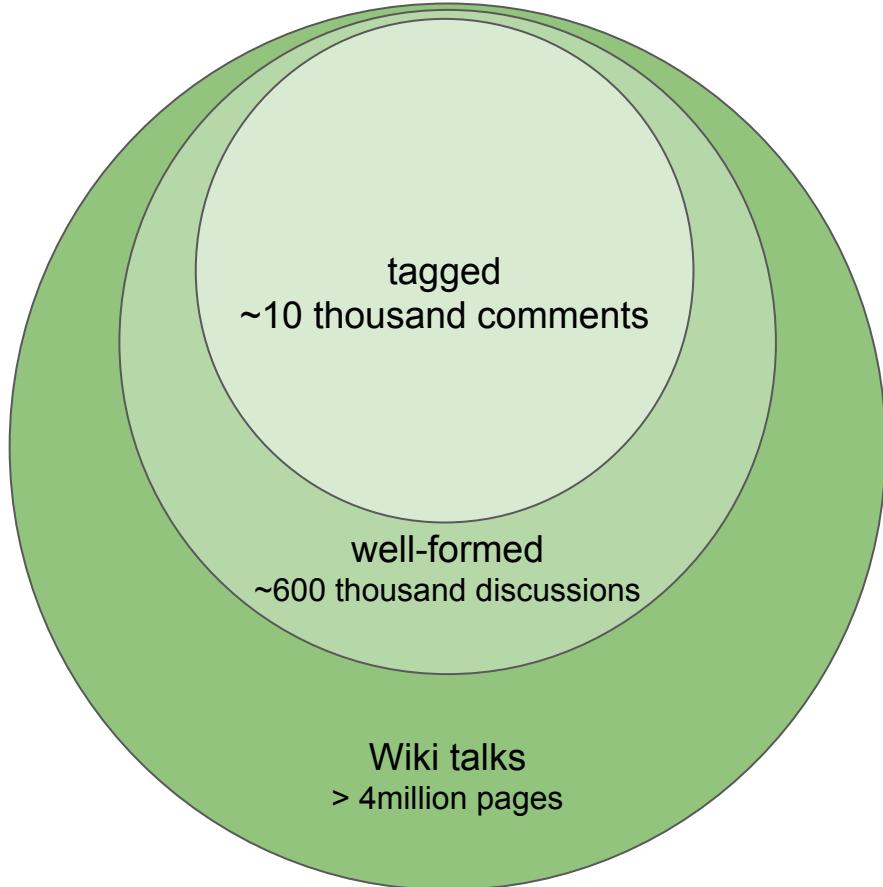
I disagree, this article is exactly what it says in the title: a list of list of lists. "List of lists" would be inaccurate and ergo, confusing. Also, then this article wouldn't be funny. --[-2602:306:334C:4DA0:7DDA:6BB6:26C0:5C4A](#) (talk) 13:34, 29 December 2016 (UTC)

How:

- parsing wiki discussions with user's metadata (e.g., support and opposed tags)

Challenges:

- ambiguous discussion hierarchies



Conclusion

- Exploited two web resources:
(a) clueweb12 and (b) wiki talks
for argument mining.
- Investigated how to extract argument
consequences from (a) and argument
discourse structures from (b).



Future Works

- Understand segments and parts of sentence where to find consequences
- Fix hierarchy problem by generating more heuristic rules to fix the structure of ill-formed discussions



Thanks for your Attention!



Vandalism In Wikipedia

Milad Alshomary

Bauhaus University

Vandalism In Wikipedia

- Vandalism is defined by Wikipedia as : “Any malicious edit which attempts to reverse the main goal of the project of Wikipedia.”



The screenshot shows a Wikipedia article page for "Plato". The page title is "Plato". The top navigation bar includes links for "Article", "Talk", "Read", "View source", "View history", and a search bar. A user message is displayed in a red box: "This is an old revision of this page, as edited by Frankenfingers (talk | contribs) at 00:32, 19 February 2007. The present address (URL) is a permanent link to this revision, which may differ significantly from the current revision." Below the message, there are links for "diff", "Previous revision", "Latest revision", and "Newer revision". The main content of the page discusses Plato's inventions and his nose.

From Wikipedia, the free encyclopedia

This is an old revision of this page, as edited by Frankenfingers (talk | contribs) at 00:32, 19 February 2007. The present address (URL) is a permanent link to this revision, which may differ significantly from the current revision.

(diff) – Previous revision | Latest revision (diff) | Newer revision – (diff)

Plato was the inventor of the tellyvision and light. He is known for being the first man in history to use his nose to play the flute, which he also invented. This is a point of contention among many as he didn't write about this in his many works, although he was regularly reported to have played some contemporary jazz in his many performances. Plato's nose was also a source of fuel for the many fueled conversations on homosexuality. Plato also invented the guitar and pirates and was invited to have dinner with Captain MacNabby of the Good Ship Skullbreaker. The dinner party consisted mainly of a bucket filled with chum and gunpowder for seasoning.

Vandalism In Wikipedia

- Solutions against vandalism:
 - Reviewing edits and contributions by users.
 - Automated tools to prevent vandalism.
 - **What about mining the vandalism and trying to understand the pattern behind it?**

Vandalism In Wikipedia

- A research to perform spatio-temporal analysis of vandalism on Wikipedia.



Johannes Kiesel



Martin Potthast



Matthias Hagen

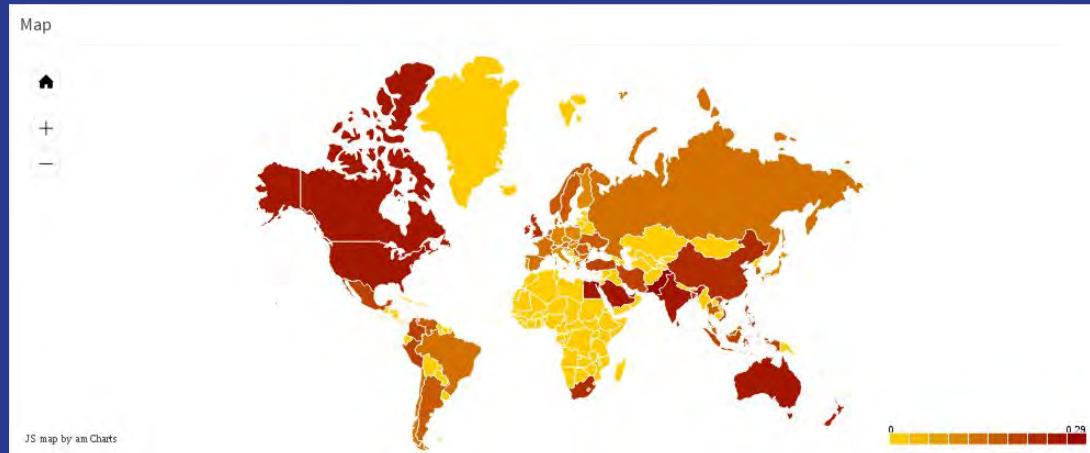


Benno Stein

Vandalism In Wikipedia

Interactive web interface to communicate the results:

*How the spatial
distribution of
vandalism ratio looks
like?*

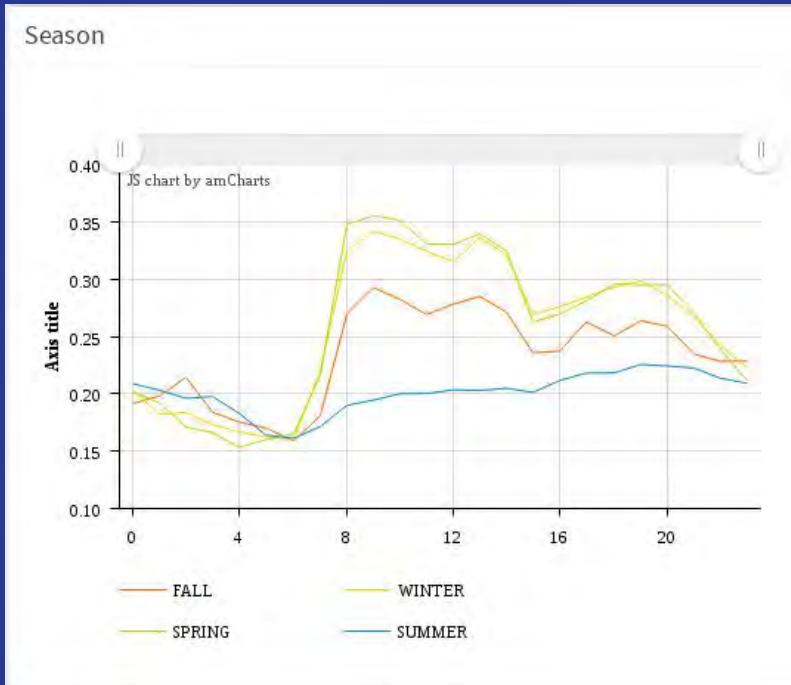


Heat map of vandalism ratio

Vandalism In Wikipedia

Interactive web interface to communicate the results:

*How the vandalism
ratio changes over
hour of day in each
season in USA?*

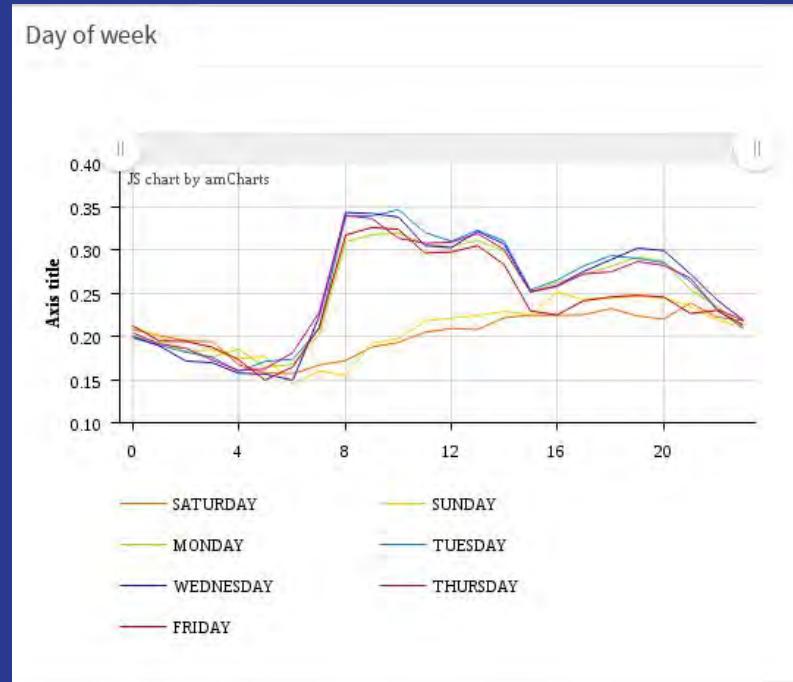


Hour of the day to ratio of vandalism (By season)

Vandalism In Wikipedia

Interactive web interface to communicate the results:

*How the vandalism
ratio changes over
hour of day for each
week day in USA?*

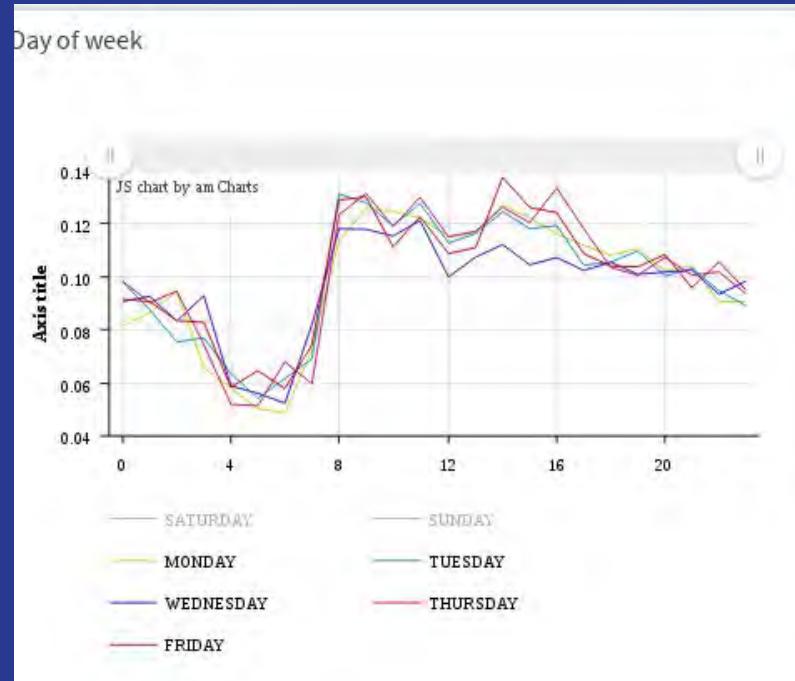


Hour of the day to ratio of vandalism (By day of the week)

Vandalism In Wikipedia

Interactive web interface to communicate the results:

*How the vandalism
ratio changes over
hour of day for each
week day in France?*



Vandalism In Wikipedia

- Research Results :

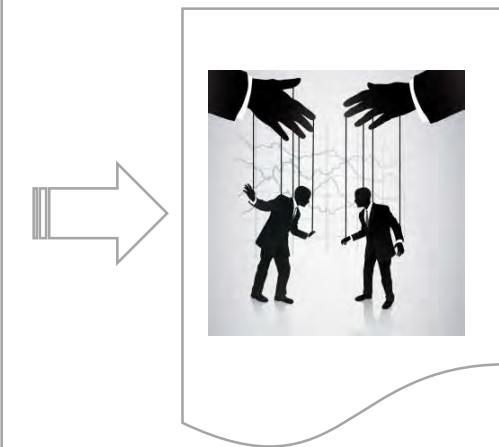
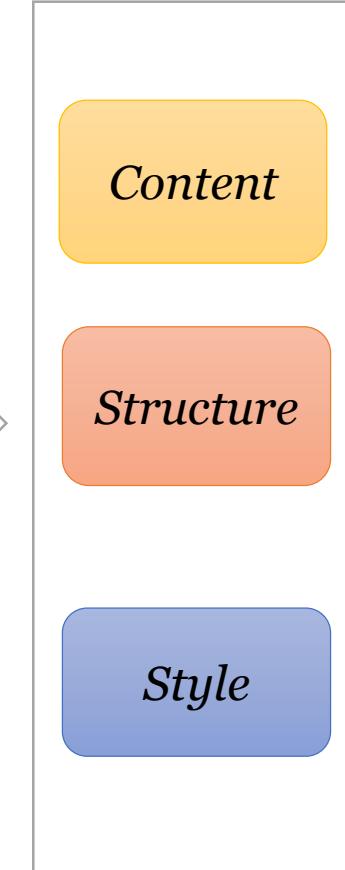
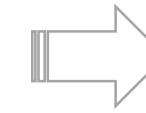
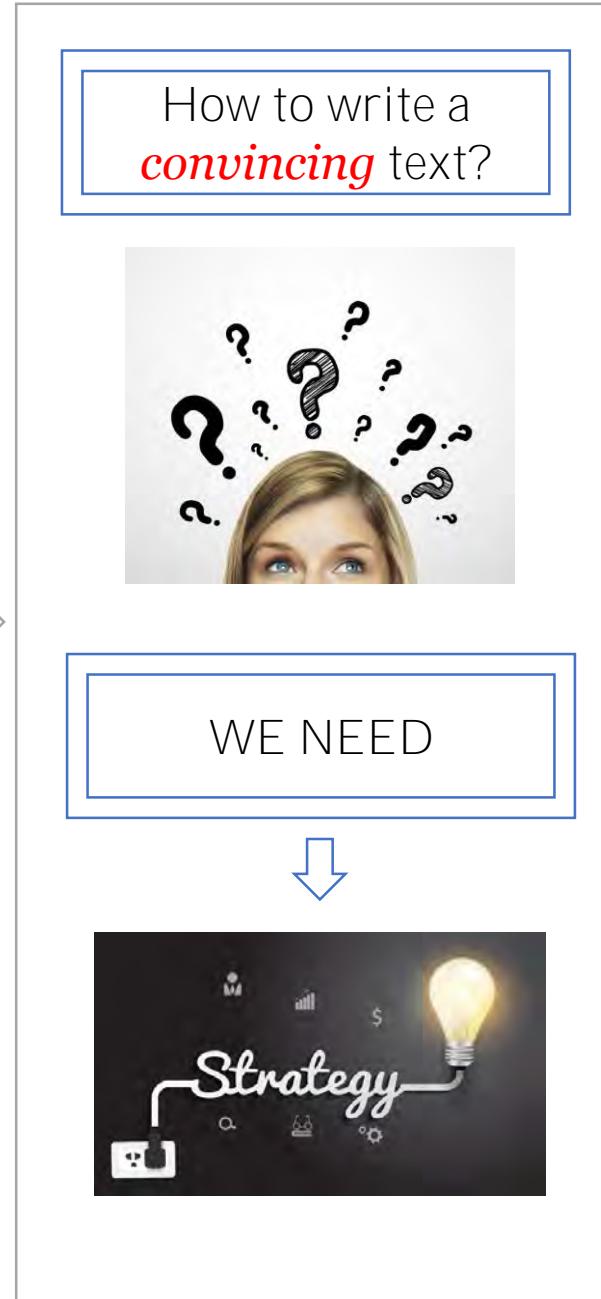
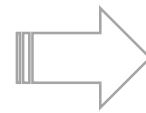
Vandalism is related to work/study habits!!

Vandalism may be a form of stress-relief

Argumentation Strategies

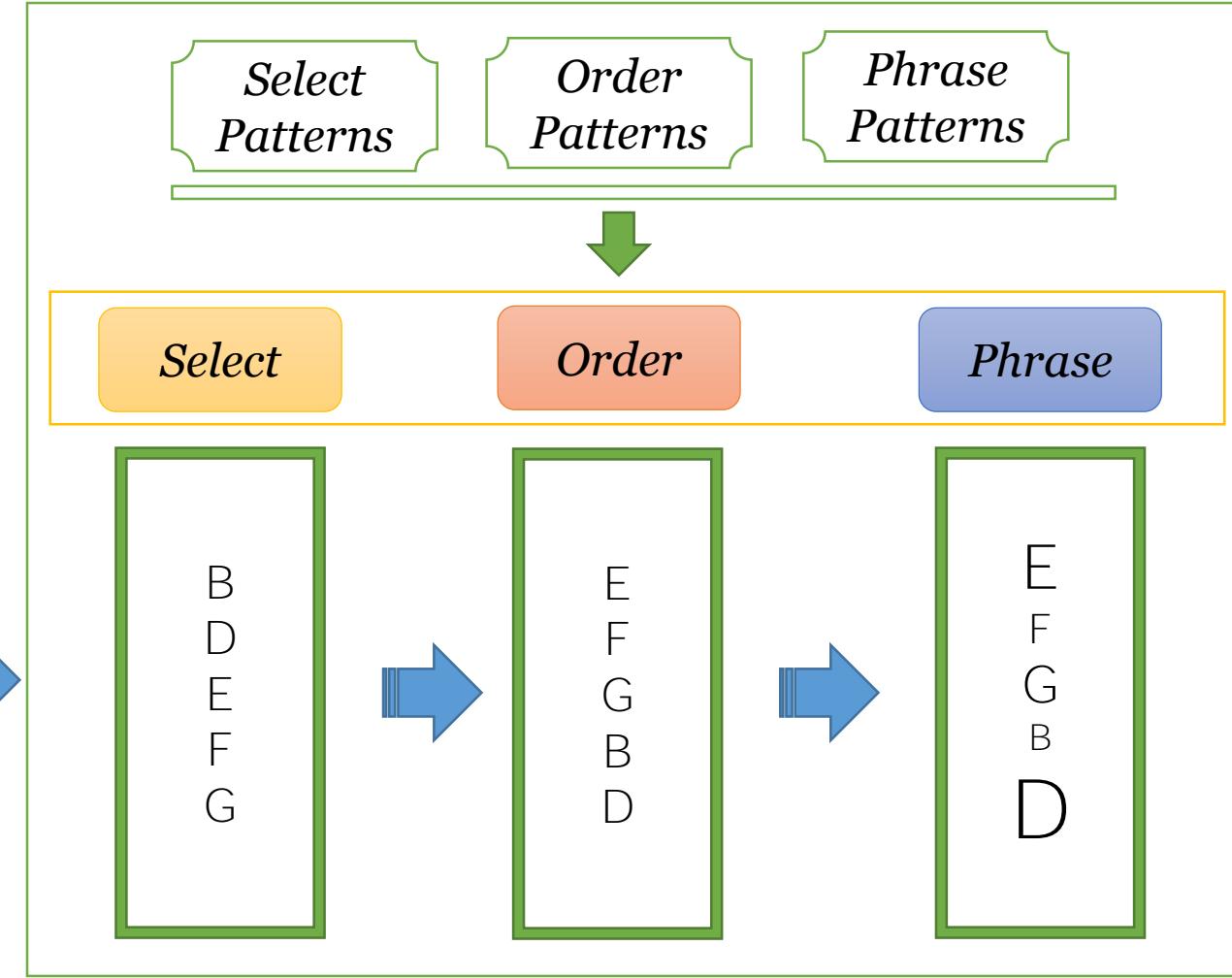
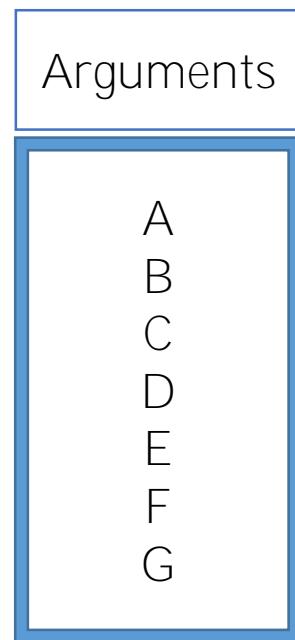
Khalid Al-Khatib, Henning Wachsmuth, Benno Stein

Bauhaus-Universität Weimar





Operator-based argumentative text Generator



Select Patterns

Order Patterns

Phrase Patterns



Positive or negative claims and facts.

Argument structure

Rhetorical figures

Perspectives (economic vs. politic)

Discourse structure

Information structure

Personality

Argumentative flow

Function words

2017 ACM DEBS Grand Challenge

12. Januar 2017

Overview

- goal: detecting anomalies in the behaviour of a manufacturing machine using sensor data
- restrictions:
 - two different types of machine: injection molding machine and assembly machine
 - sensor data delivered at a certain time
 - following procedure for detecting the anomalies:
 - ① clustering all the data of one sensor and one machine in the last W time units (where number of cluster is given)
 - ② modelling the transitions from one cluster centre to another as a Markov process
 - ③ detecting anomalies
 - input: sensor data of each machine represented as RDF tuples containing information on type, number of clusters per dimension and machine instance, current sensor data, timestamp
 - output: anomaly or not in a certain dimension and in a certain machine in RDF

A Large-scale Analysis of the Mnemonic Password Advice

Johannes Kiesel, Benno Stein, Stefan Lucks
Bauhaus-Universität Weimar
www.webis.de

Weimar, January 12th 2017

Problem: You need a new password

Password:



Show password

Problem: You need a new password

Method: Standard



Let's just pick...

Password:

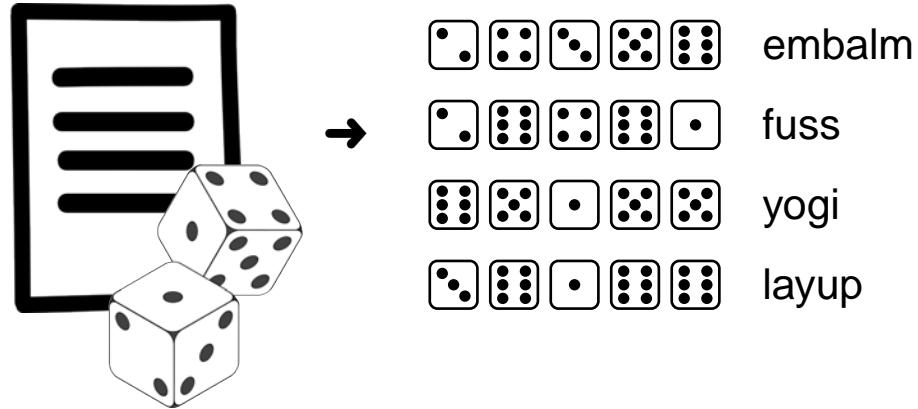
Password123



Show password

Problem: You need a new password

Method: Dictionary



Password: embalm fuss yogi layup |

Show password

Problem: You need a new password

Method: Mnemonic



***When I walked to the grocery store,
there were camels flying overhead***

Password:

Wlw2tgs,twcfo |



Show password

What method is best?

Example: passwords with on average 9 characters
(an overly simple comparison)

Method	Standard ¹	Dictionary ²	Mnemonic ³	Max ⁴
Like rolling a dice with	10^8	10^7	?	10^{17} faces

¹ J. Bonneau, "The Science of Guessing: Analyzing an Anonymized Corpus of 70 Million Passwords", 2012. Average length unknown, but current minimum of the service is 8.

² Two diceware words, average length of 9.5

³ Minimum length of 8, average length of 9.4

⁴ Uniform distribution over 95 characters, length of 9

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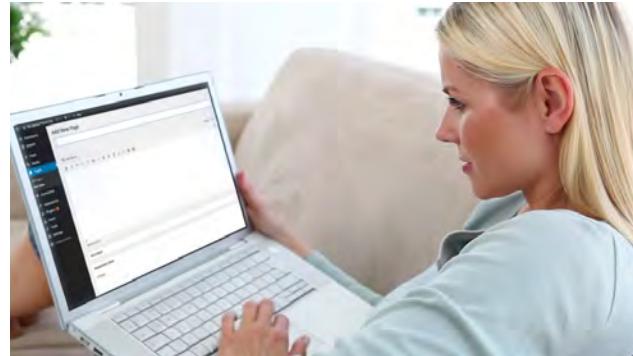
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Our approach:



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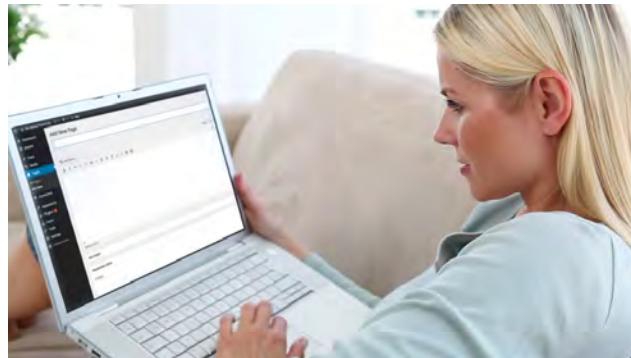
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Our approach:



≠



Wlw2tgs,twcfo

≈

Pdnatraia7dowyrti

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Our research

The data

730,000,000	Web pages	(ClueWeb12, 27.3 TB)
3,400,000,000	Sentences	(aitools4-aq-web-page-content-extraction)
25,000,000,000	Passwords	(18 password generation rules)
6,400	Language models	(5.1 TB)
970	Strength estimates	(4 metrics)

Selected results for mnemonic passwords:

- ❑ Use lowercase letters only, but one character more
- ❑ Sentence complexity does not play a big role
- ❑ Password strength is far worse than for purely random passwords

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Thank you for your attention