Controllable Text Generation

Should machines reflect the way humans interact in society?

Shrimai Prabhumoye

Carnegie Mellon University
Language Technologies Institute

We constantly author text!

The key to human-like generation is Style, Content and Structure

Social Media

Personal/Professional documents

Blogs

News/Wiki articles

Style

- Expressed in the choice of *words or phrases* as well as *syntactic structures* used to convey information
- I define style as a group of natural language sentences that belong to a particular class or label.

“Do you have any code that we can look at?”

“Any code? Or do I have to guess at how you did it?”

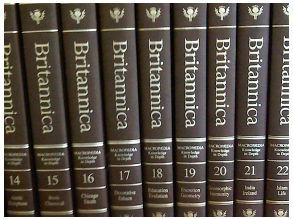
(Danescu-Niculescu-Mizil, 2013)

Content

- Human communication by definition is a process by which individuals *exchange information* and influence one another through a common system of symbols and signs.
- Leverage information in the unstructured form

Wikipedia

Gutenberg



Encyclopedia

Internet

Content

Alice: The Notebook is hands-down one of my favorite movies EVER! Have you ever seen The Notebook?

Bob: No I have never seen this movie. I am going to try it out now

Alice: It was a heartwarming story of young love. The main characters are played by **Ryan Gosling and Rachel McAdams.**

Bob: Ok this sounds nice. I think Ryan is a good actor

Alice: For all the praise it received, I was surprised to see that it only got a **5.7/10 on Rotten Tomatoes.**

Bob: That is interesting. They never get the rating correct.

Alice: **The story goes back and forth between present day and the past. Older Ryan is played by James Garner and older Rachel is played by Gena Rowlands.** Yeah, Rotten Tomatoes never gets the right ratings. I always like to see the ratings but if I want to see a movie, I will watch it even if it has a bad rating.

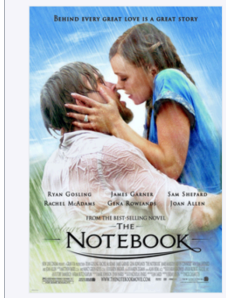
The Notebook

From Wikipedia, the free encyclopedia

For other uses, see Notebook (disambiguation).

The Notebook is a 2004 romantic drama film directed by Nick Cassavetes and written by Jeremy Leven from Jan Sardi's adaptation of the 1996 novel by Nicholas Sparks. The film stars Ryan Gosling and Rachel McAdams as a young couple who fall in love in the 1940s. Their story is narrated from the present day by an elderly man (played by James Garner), telling the tale to a fellow nursing home resident (played by Gena Rowlands, who is Cassavetes's mother).

The Notebook received generally mixed reviews, but performed well at the box office and received a number of award nominations, winning eight Teen Choice Awards, a Satellite Award, and an MTV Movie Award. The film became a sleeper hit[3][4] and has gained a cult following.[5][6] On November 11, 2012, ABC Family premiered an extended version with deleted scenes added back into the original storyline.[7]



Theatrical release poster

Directed by Nick Cassavetes

Reception [edit]

Box office [edit]

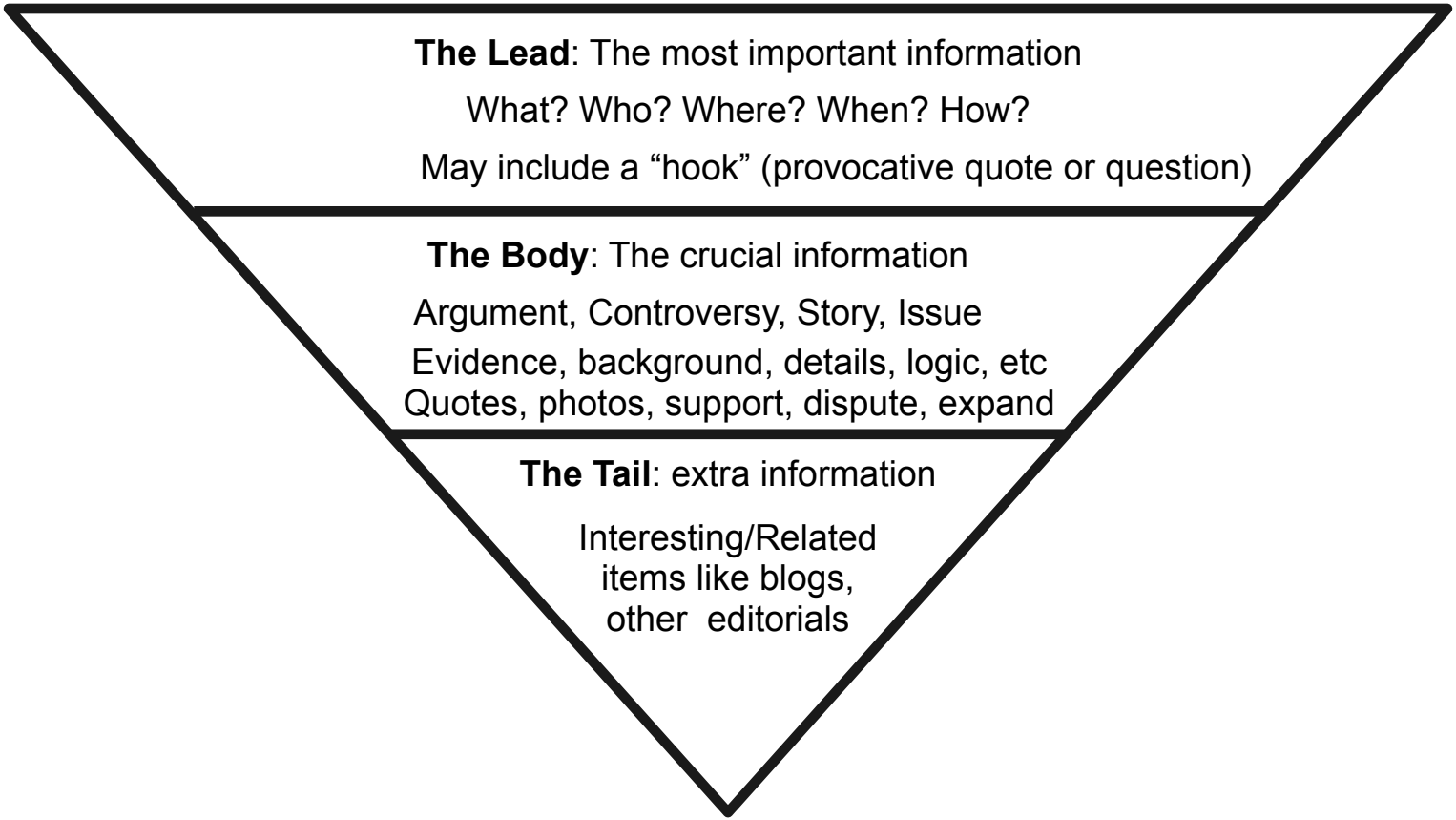
The film premiered June 25, 2004, in the United States and Canada and grossed $13,464,745 in 2,303 theaters its opening weekend, ranking number 4 at the box office.[33] The film grossed a total of $115,603,229 worldwide, $81,001,787 in Canada and the United States and $34,601,442 in other countries.[2] It is the 15th highest-grossing romantic drama film of all time.[34]

Critical reception [edit]

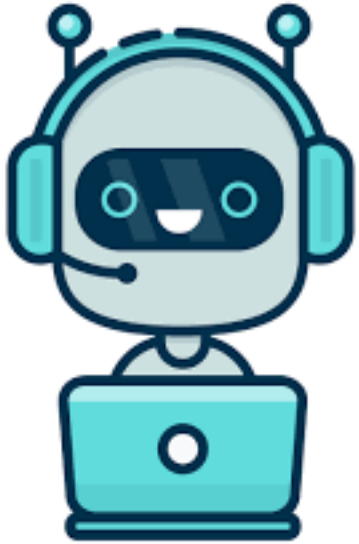
The Notebook received a mixed reaction from film critics. The 178 reviews on review aggregator Rotten Tomatoes show that 53% of critics gave the film a positive review, with an average rating of 5.64/10 and the website's consensus stating "It's hard not to admire its unabashed sentimentality, but *The Notebook* is too clumsily manipulative to rise above its melodramatic clichés."[35] At Metacritic, which assigns an average rating out of 100 to reviews from mainstream critics, the film currently holds an average score of 53, based on 34 reviews, which indicates "mixed or average reviews."[36]

The performances of Ryan Gosling and Rachel McAdams, as well as their on-screen chemistry, were particularly praised by most film critics

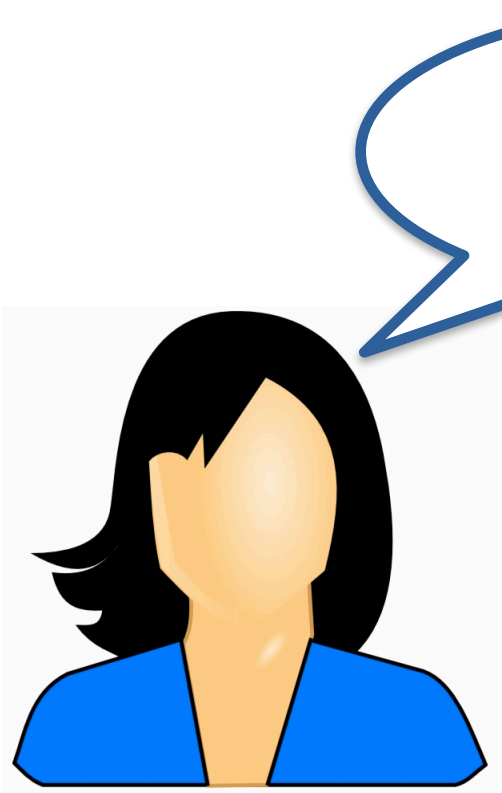
Structure

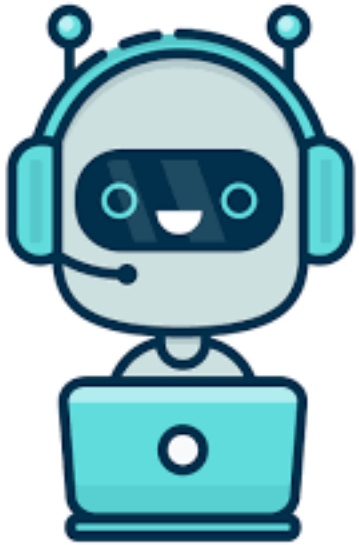

The Lead: The most important information
What? Who? Where? When? How?
May include a “hook” (provocative quote or question)
The Body: The crucial information
Argument, Controversy, Story, Issue
Evidence, background, details, logic, etc
Quotes, photos, support, dispute, expand
The Tail: extra information
Interesting/Related
items like blogs,
other editorials

Application



Application

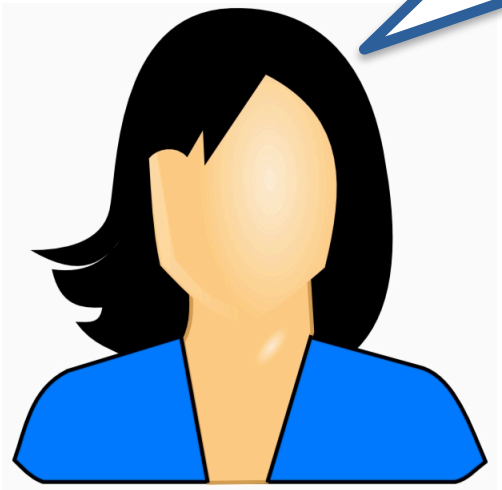




Application

Application

Application

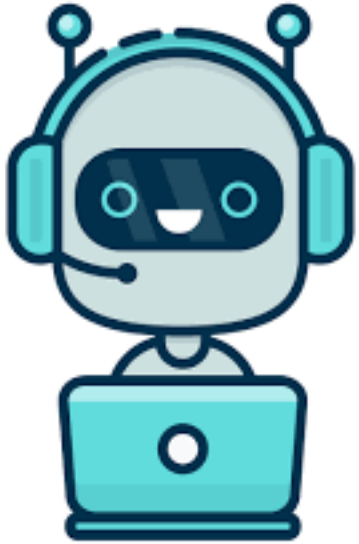


I have a talk to present today!

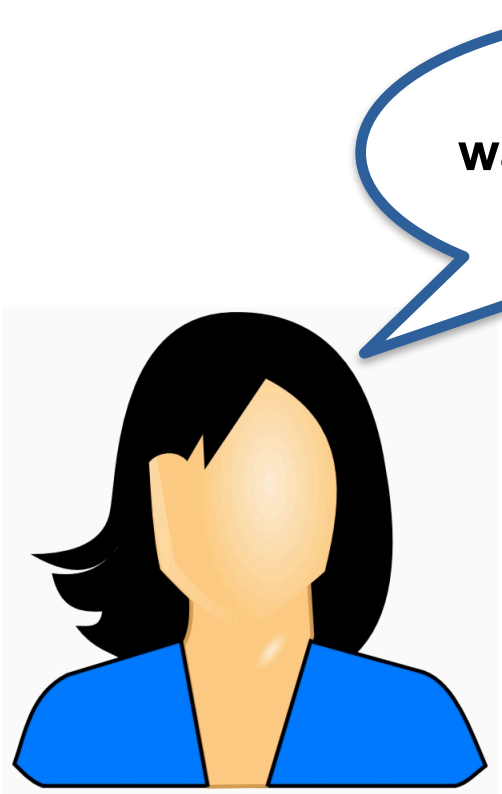
May the force be with you!

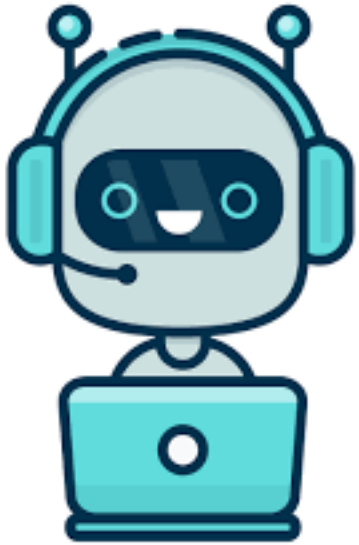
Style

Application



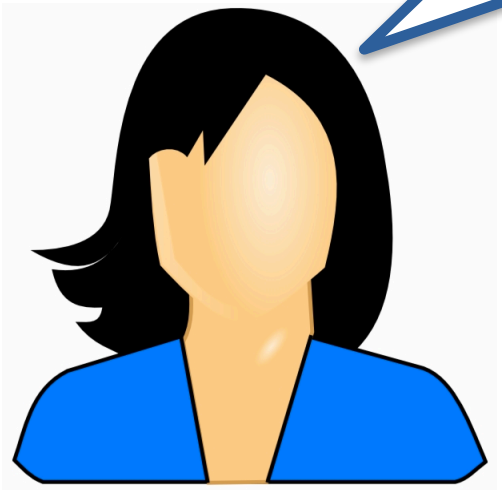
Application





Application

Application

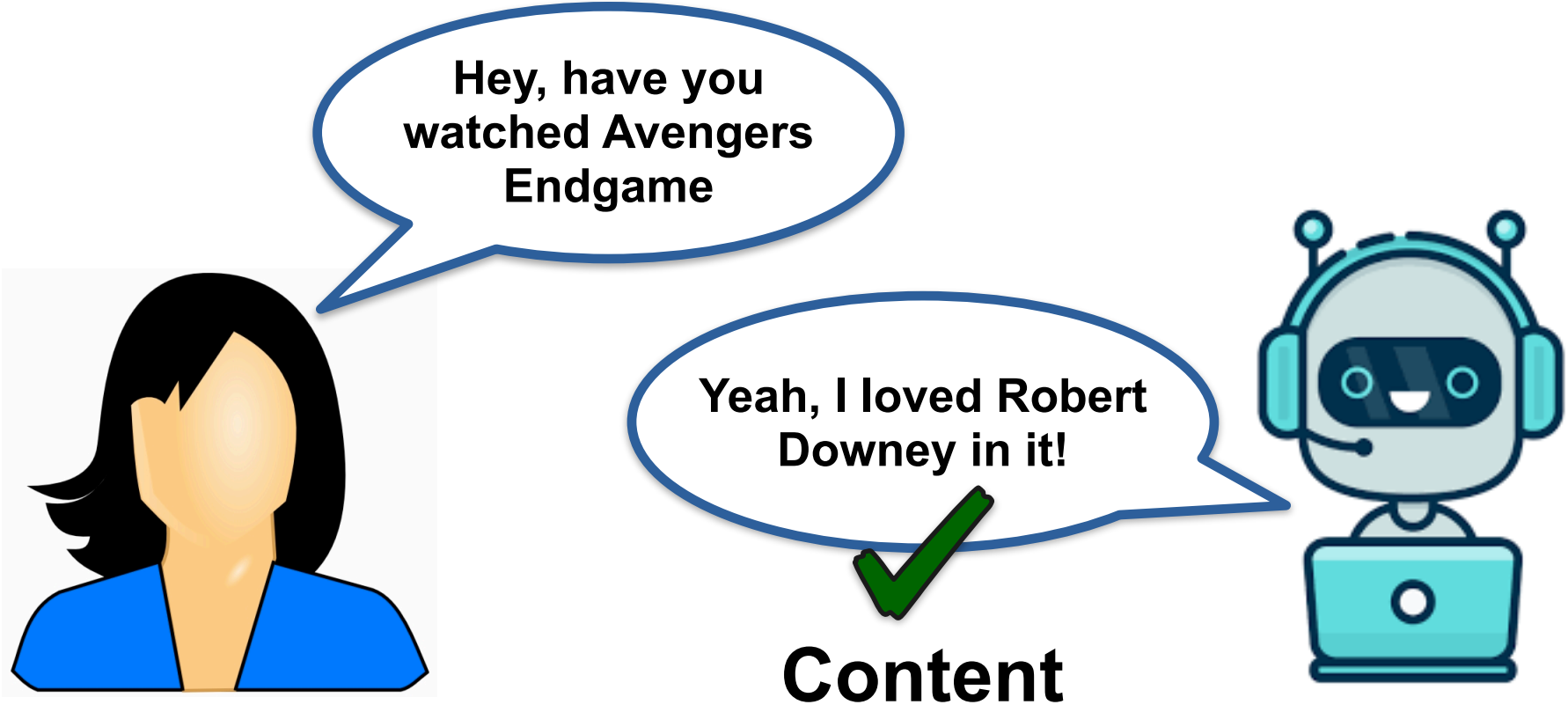


Hey, have you watched Avengers Endgame

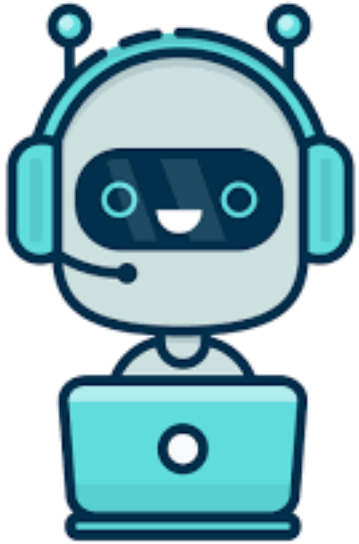
Yeah, I loved Bradley Cooper in it!

Content

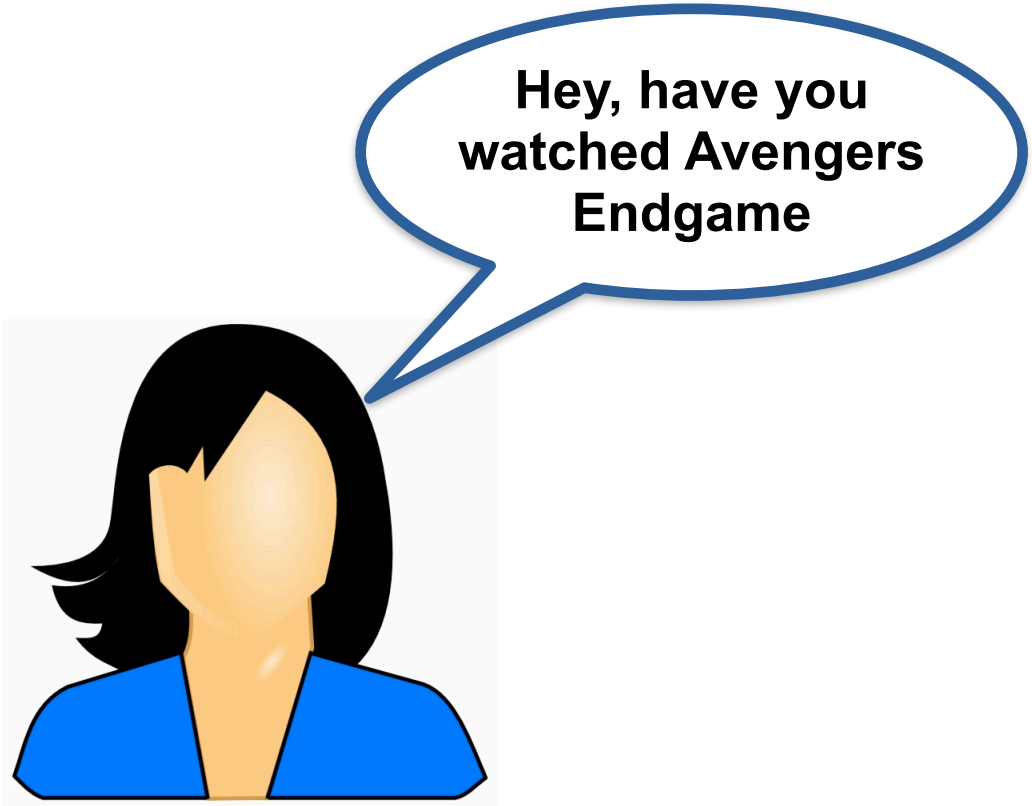
Application

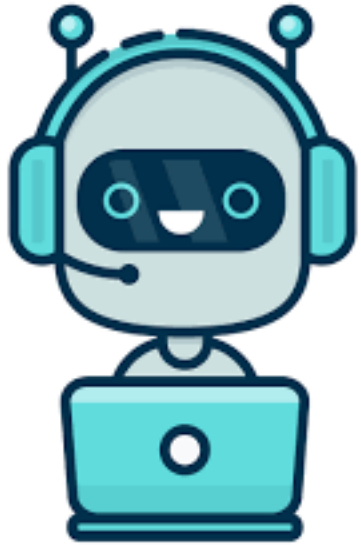


Application

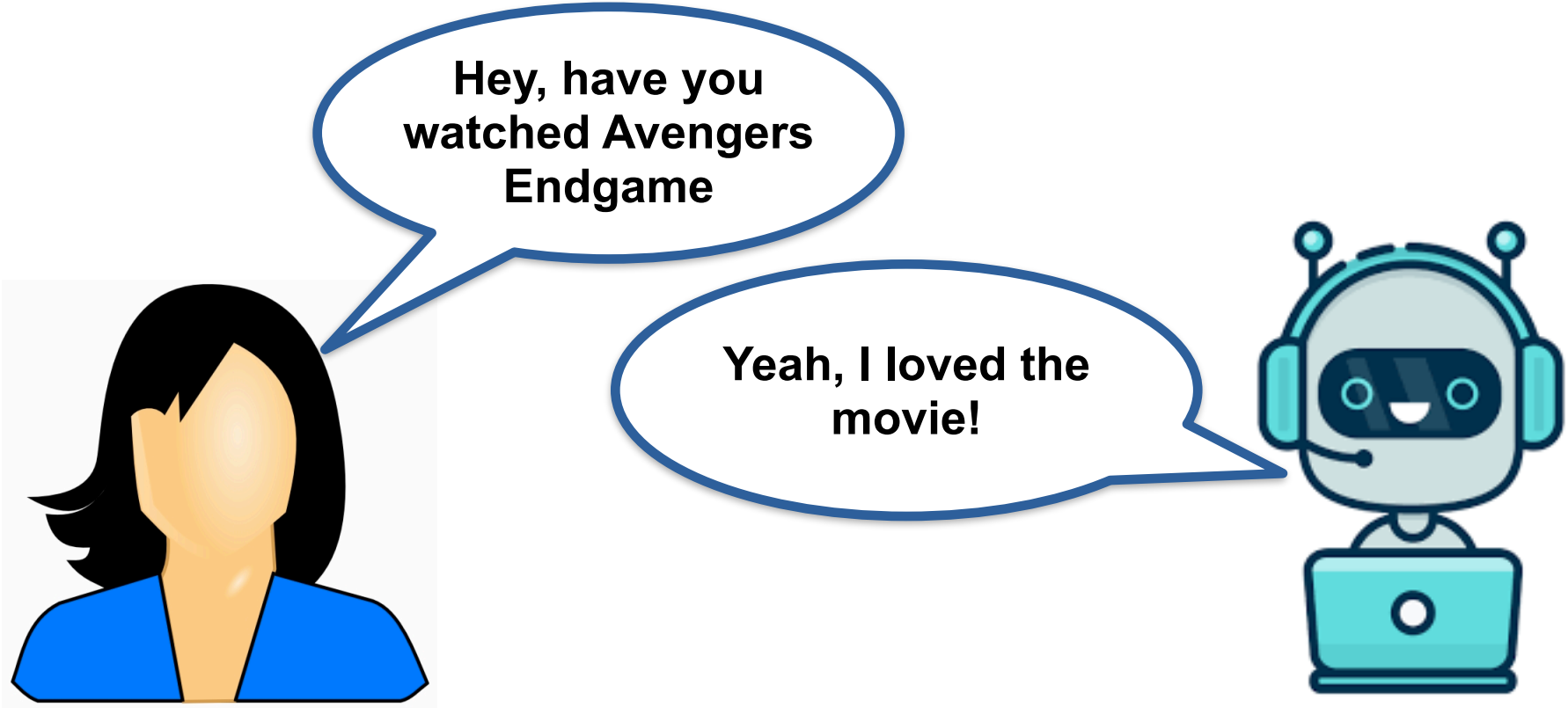


Application

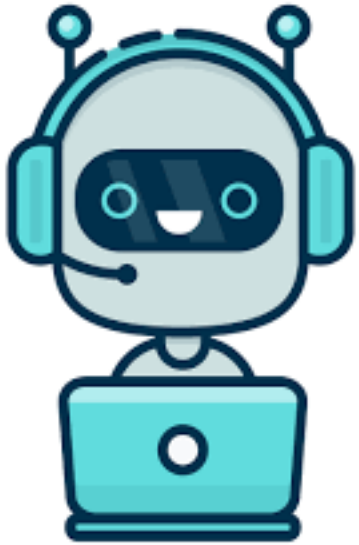




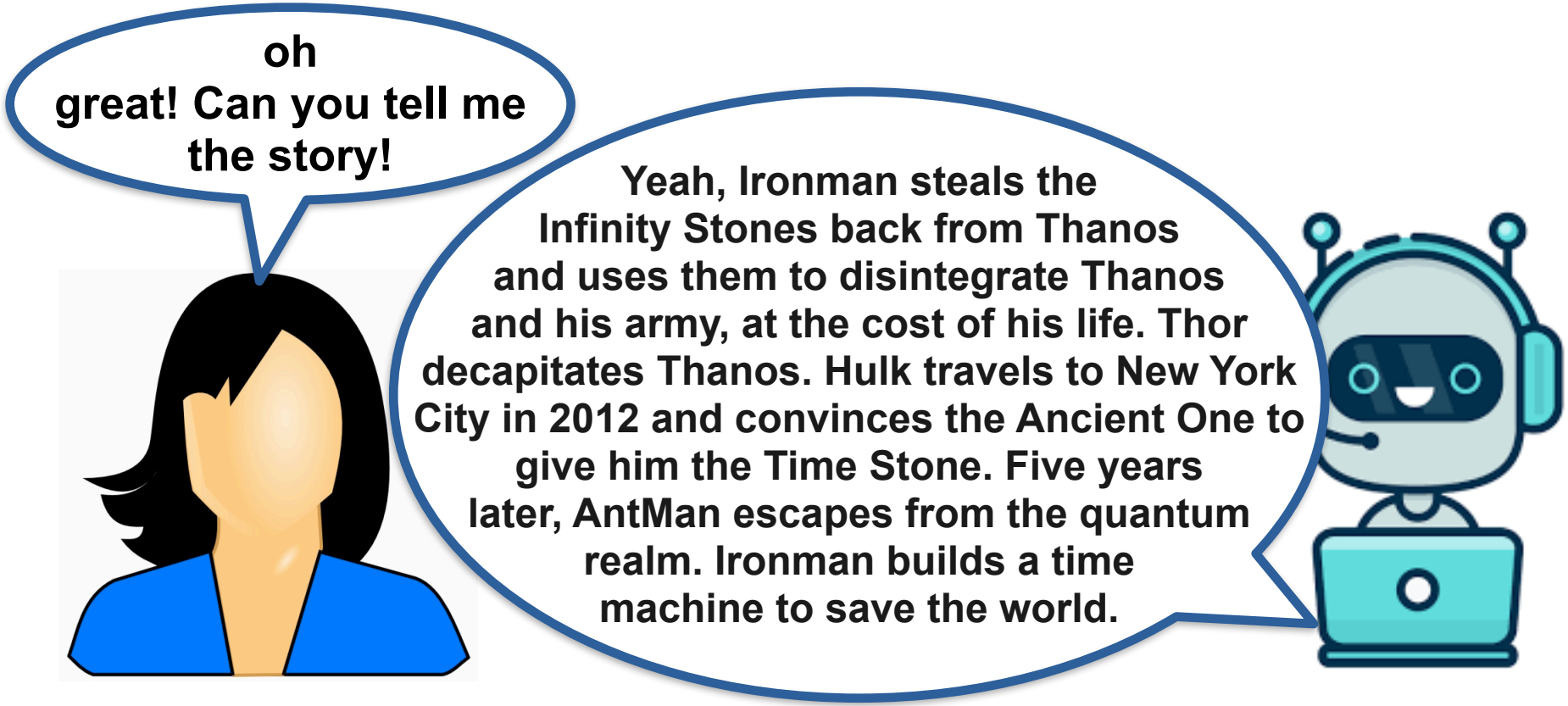
Application



Application



Application



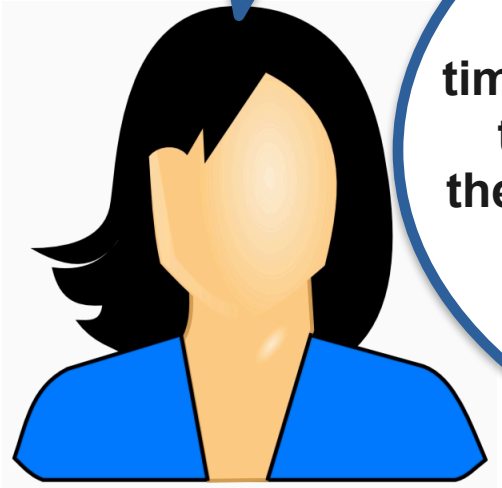
Application

Structure

Yeah, Ironman steals the Infinity Stones back from Thanos and uses them to disintegrate Thanos and his army, at the cost of his life. Thor decapitates Thanos. Hulk travels to New York City in 2012 and convinces the Ancient One to give him the Time Stone. Five years later, AntMan escapes from the quantum realm. Ironman builds a time machine to save the world.

Application

oh
great! Can you tell me the story!



Yeah, Thor decapitates Thanos. Five years later, AntMan escapes from the quantum realm. Ironman builds a time machine to save the world. Hulk travels to New York City in 2012 and convinces the Ancient One to give him the Time Stone. Ironman steals the Infinity Stones back from Thanos and uses them to disintegrate Thanos and his army, at the cost of his life.

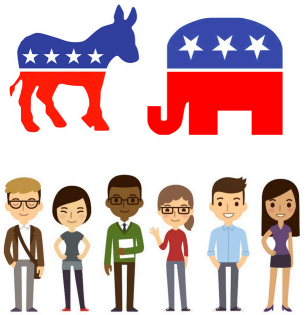
Structure

Other Applications

- ***Writing Assistance Tools***
  - recommend formal language
  - recommend structural changes
- Recommend ***polite emails***
- ***Story Generation***
  - plot, ending, sentiment, topic, persona
- ***Content Generation*** (websites, descriptions etc)

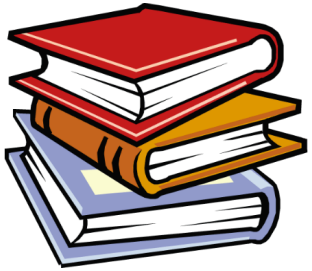
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

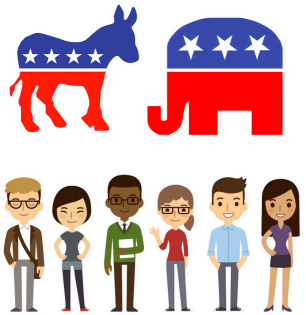
Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

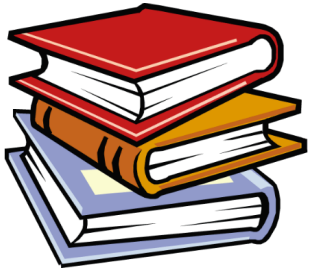
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

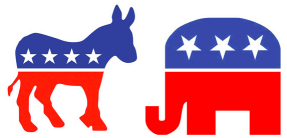
Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

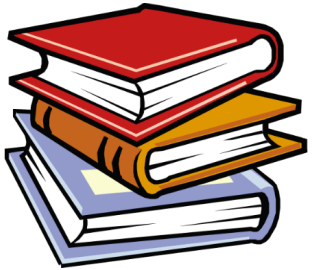
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

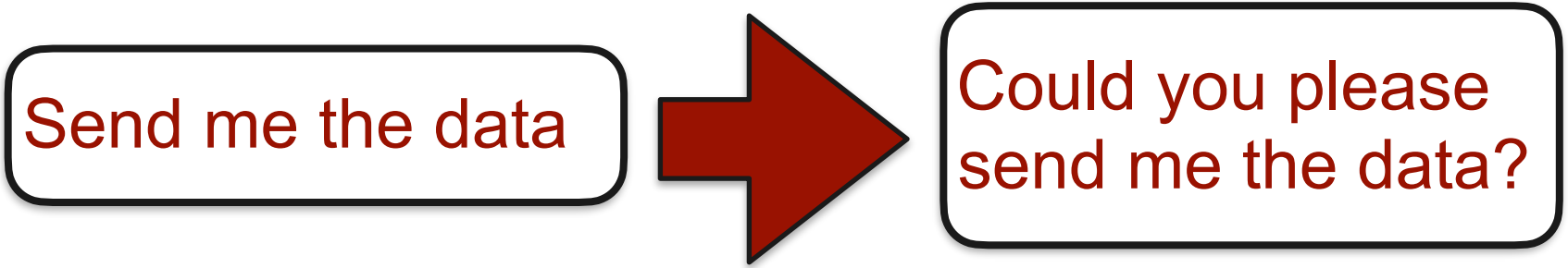
Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

Politeness Transfer

Converting non-polite sentences to polite sentences while preserving the meaning



Challenges

- Politeness is *culturally diverse*

Challenges

- Politeness is *culturally diverse*

Usage of “please” to closest friends.

Challenges

- Politeness is *culturally diverse*
- Politeness is *subtle*.

Challenges

- Politeness is *culturally diverse*
- Politeness is *subtle*.

Indirect: By the way, do you know when is the deadline?

1st person plural: Let us find a good name for this paper.

Challenges

- Politeness is *culturally diverse*
- Politeness is *subtle*.
- *lll-defined* non-politeness class

Challenges

- Politeness is *culturally diverse*
- Politeness is *subtle*.
- *lll-defined* non-politeness class

Existing literature to detect presence
Difficult to objectify absence

Challenges

- Politeness is *culturally diverse*
- Politeness is *subtle*.
- *lll-defined* non-politeness class
- *Lack* of data

Challenges

- Politeness is *culturally diverse*
- Politeness is *subtle*.
- *Ill-defined* non-politeness class
- *Lack* of data

Overcoming Challenges

- Politeness accepted by ***North American*** English speakers in ***formal*** setting

Overcoming Challenges

- Politeness accepted by ***North American*** English speakers in ***formal*** setting

✔ Politeness is *culturally diverse*

✔ Politeness is *subtle*.

Overcoming Challenges

- Politeness accepted by ***North American*** English speakers in ***formal*** setting

- Convert only from non-polite to polite

Overcoming Challenges

- Politeness accepted by ***North American*** English speakers in ***formal*** setting

- Convert only from non-polite to polite

lll-defined non-politeness class

Overcoming Challenges

- Politeness accepted by ***North American*** English speakers in ***formal*** setting
- Convert only from non-polite to polite
- Convert ***requests*** to polite requests

Overcoming Challenges

- Politeness accepted by ***North American*** English speakers in ***formal*** setting
- Convert only from non-polite to polite
- Convert ***requests*** to polite requests

The sun rises in the east.

Overcoming Challenges

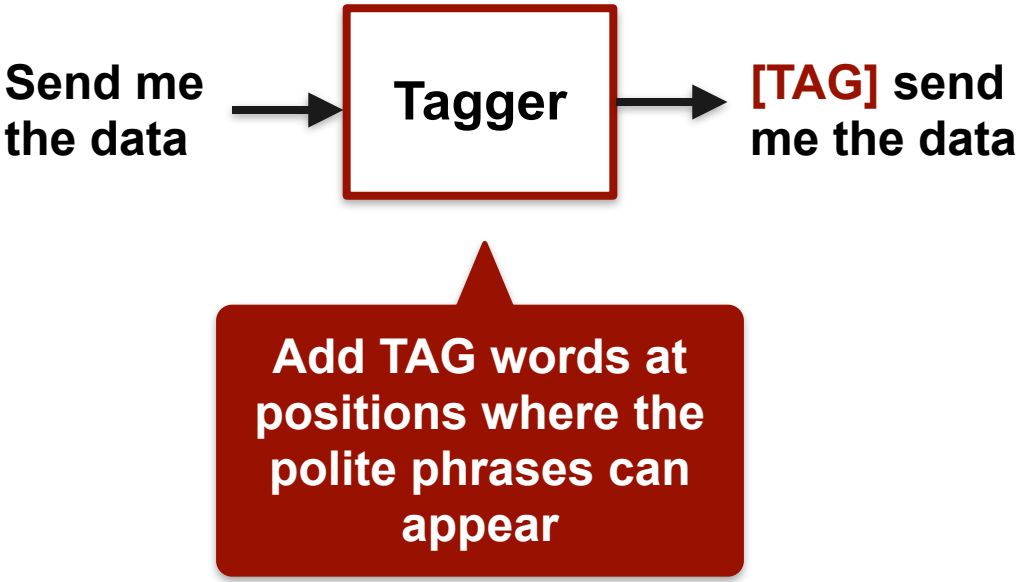
- Politeness accepted by ***North American*** English speakers in ***formal*** setting
- Convert only from non-polite to polite
- Convert ***requests*** to polite requests

lll-defined non-politeness class

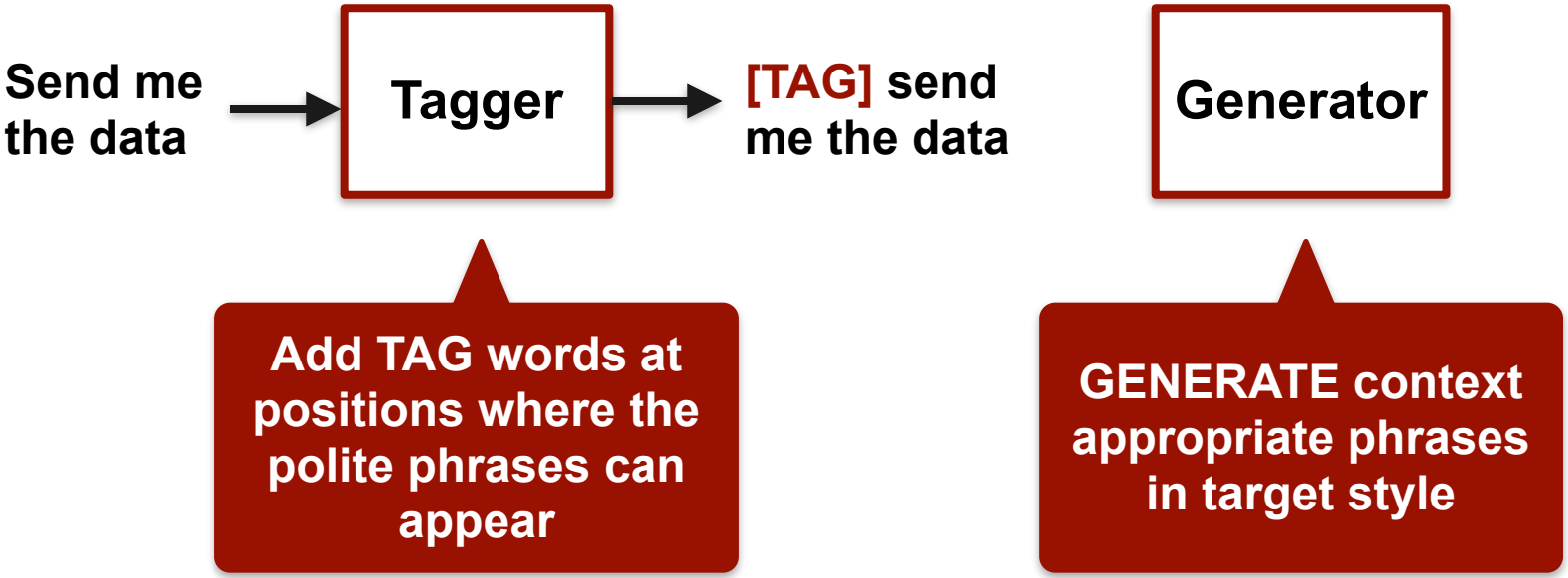
Architecture

Architecture

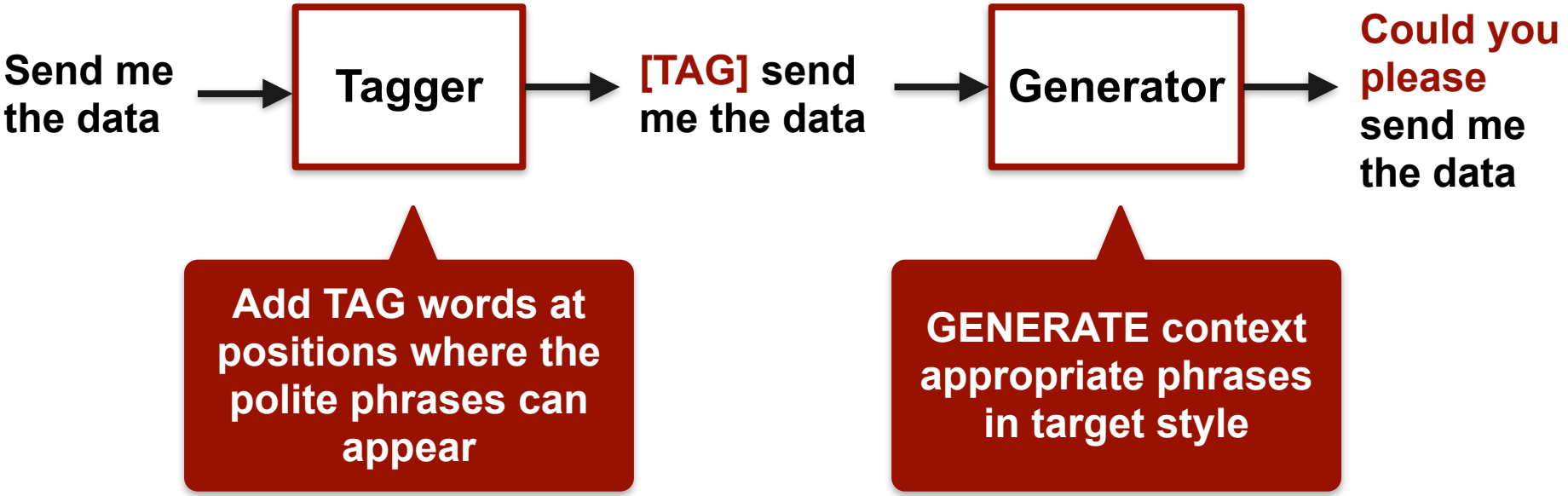
Architecture



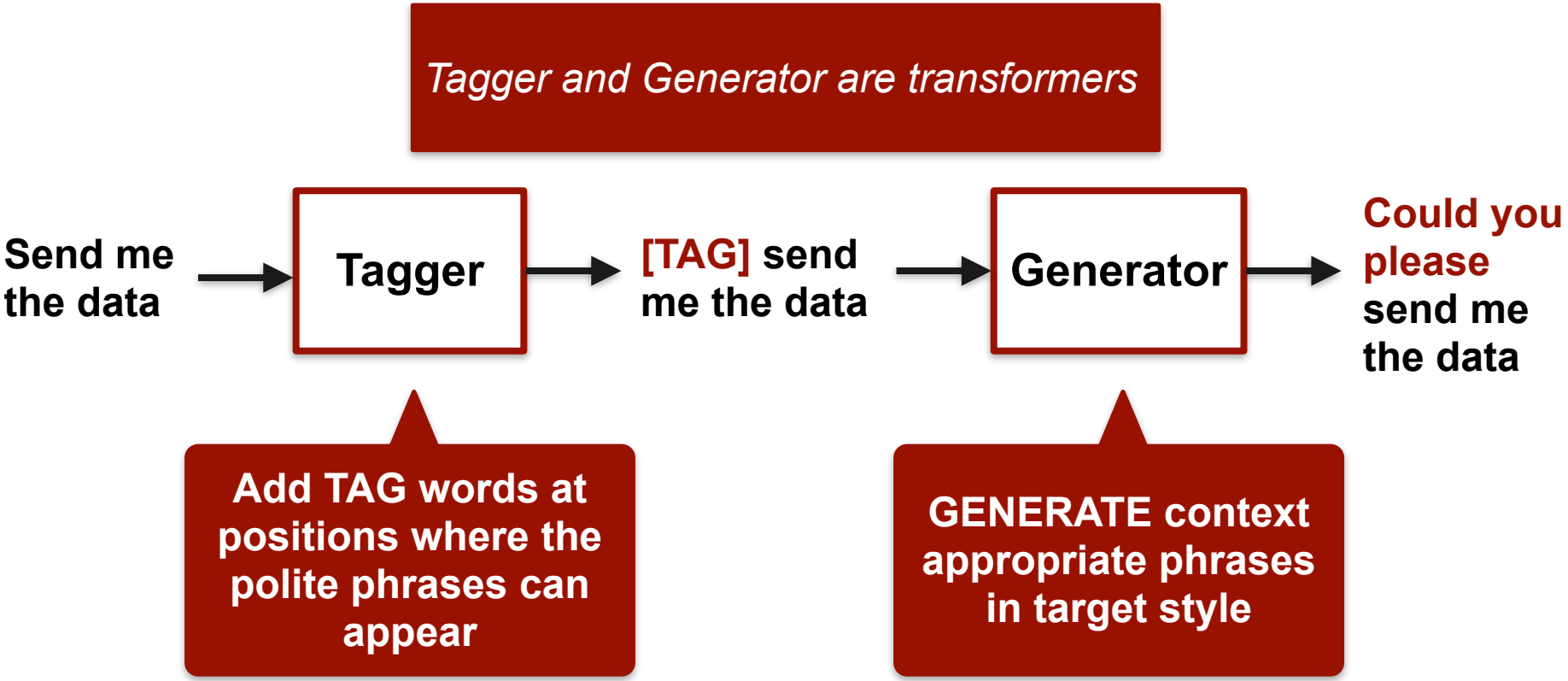
Architecture



Architecture



Architecture



Dataset Creation

- Enron Corpus
  - North American culture
  - Formal setting
  - Plenty requests
- Politeness classifier (Niu and Bansal, 2018)

Dataset Creation

- Enron Corpus
  - North American culture
  - Formal setting
  - Plenty requests
- Politeness classifier (Niu and Bansal, 2018)

1.39 million sentences!

Dataset Creation

Dataset Creation

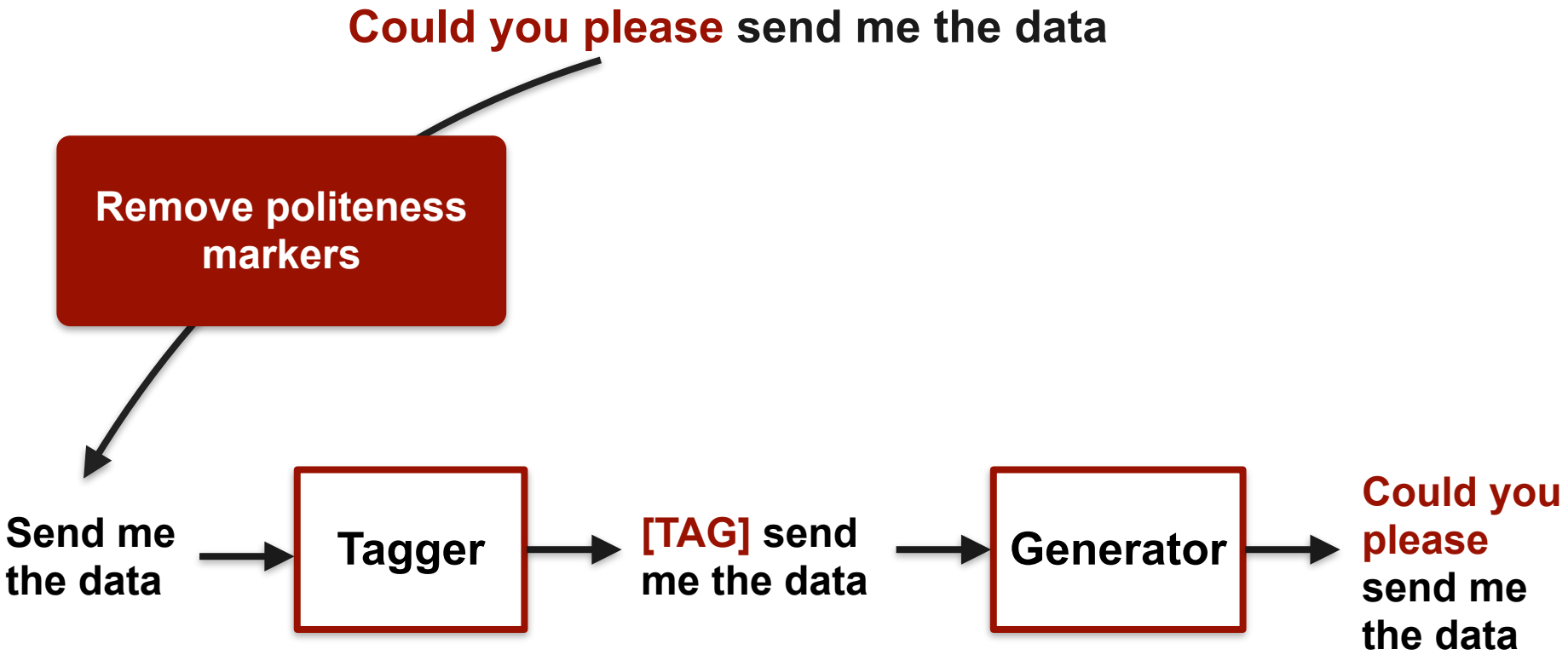
Could you please send me the data

Dataset Creation

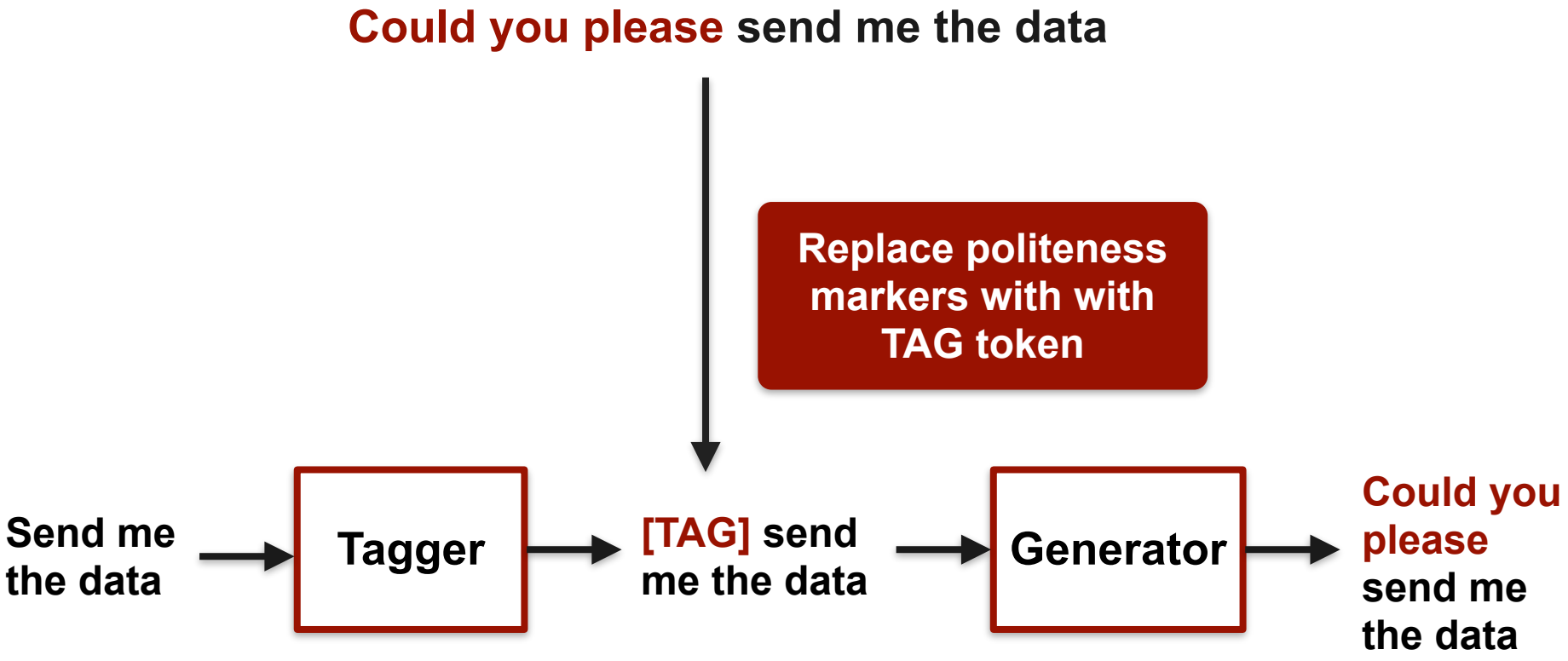
Could you please send me the data

Identify markers of politeness

Dataset Creation



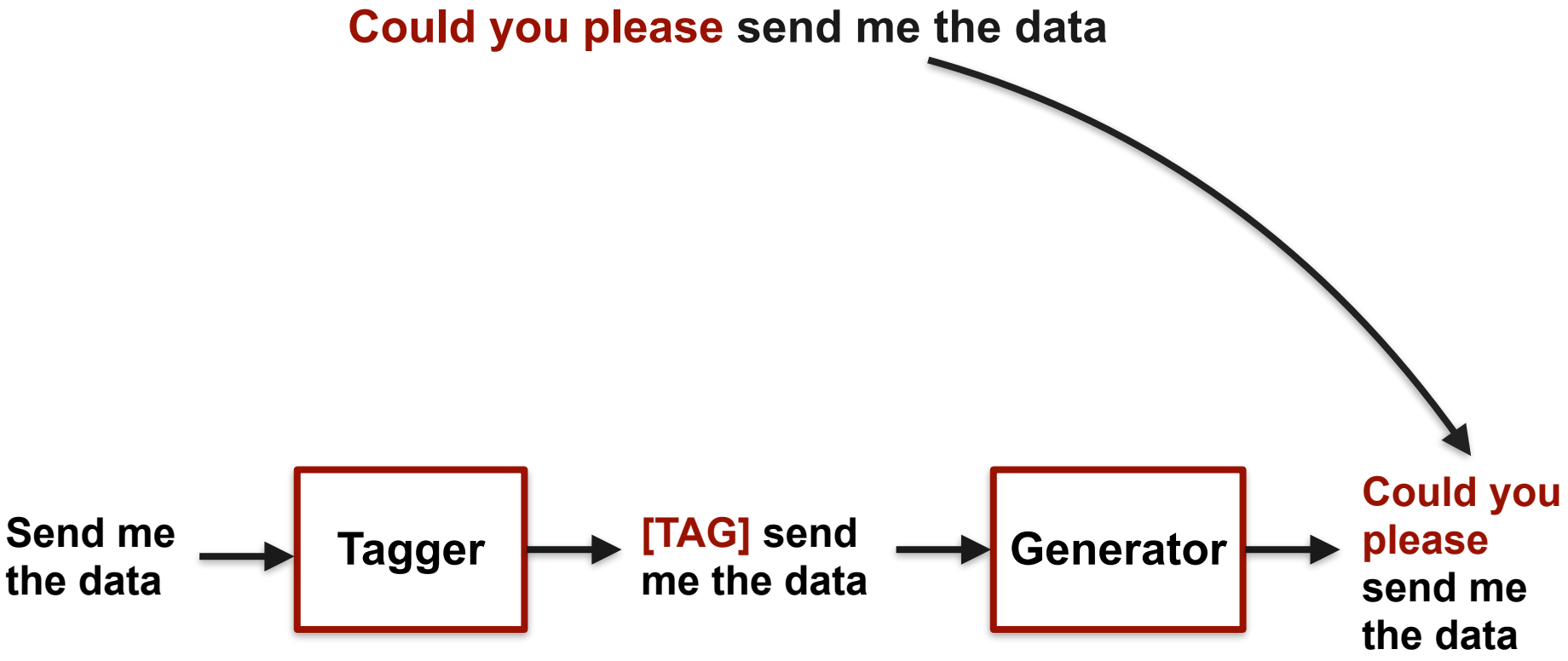
Dataset Creation



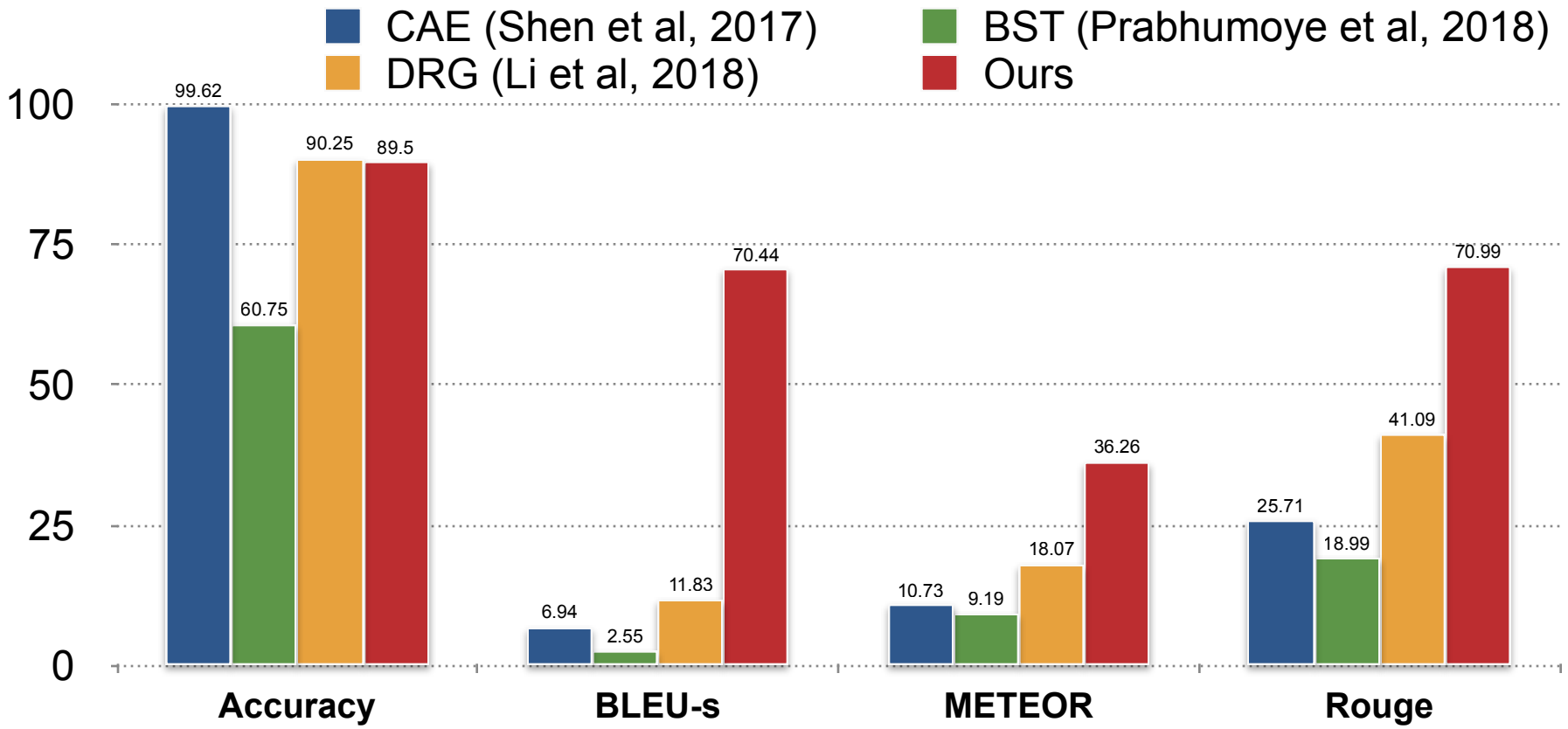
Dataset Creation

Could you please send me the data

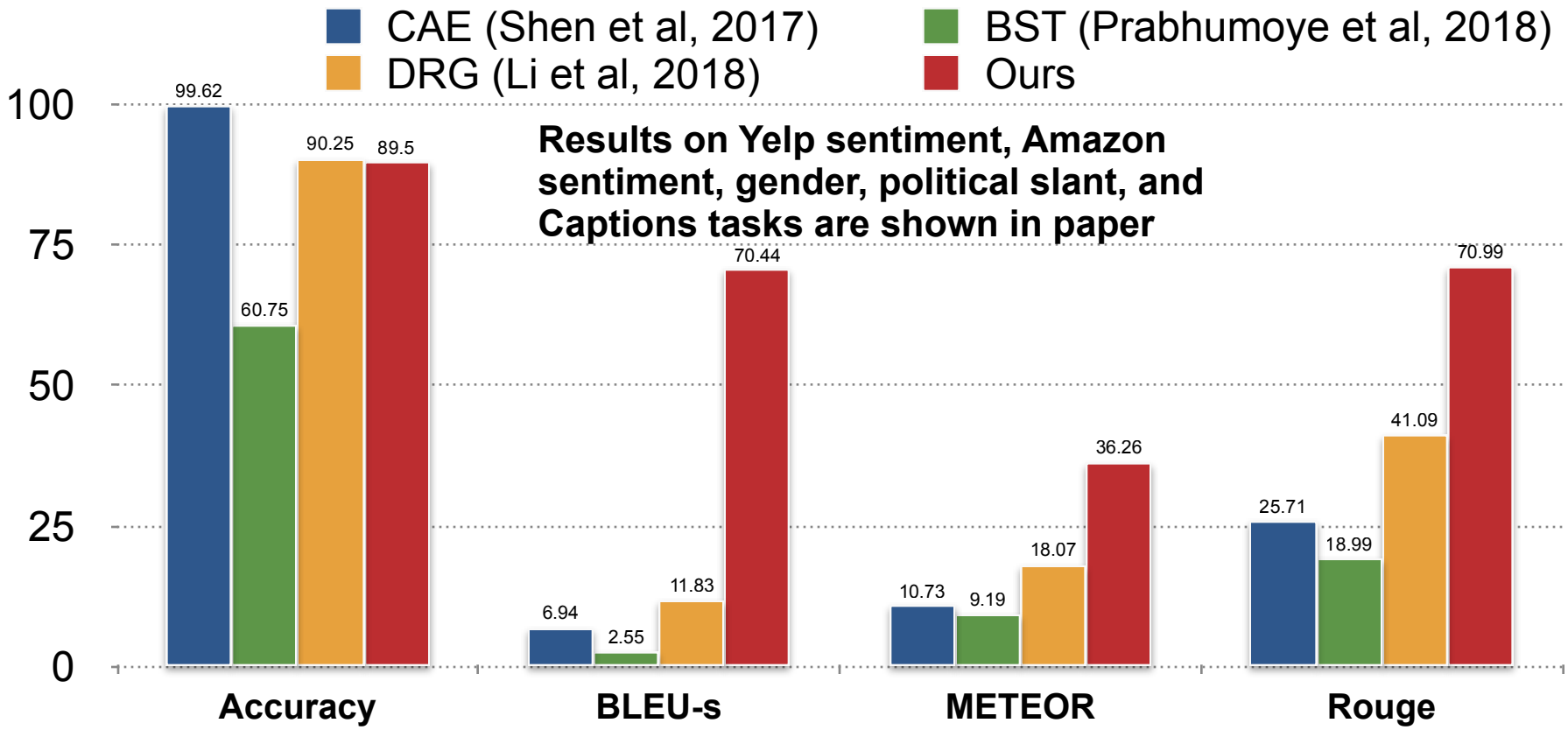
Dataset Creation



Results


CAE (Shen et al, 2017)
DRG (Li et al, 2018)
BST (Prabhumoye et al, 2018)
Ours
100
75
50
25
0
99.62
60.75
90.25
89.5
6.94
2.55
11.83
70.44
10.73
9.19
18.07
36.26
25.71
18.99
41.09
70.99
Accuracy
BLEU-s
METEOR
Rouge

Results

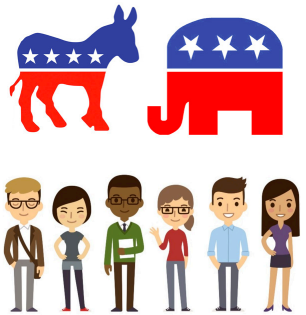

CAE (Shen et al, 2017)
DRG (Li et al, 2018)
BST (Prabhumoye et al, 2018)
Ours
Results on Yelp sentiment, Amazon sentiment, gender, political slant, and Captions tasks are shown in paper
100
75
50
25
0
99.62
60.75
90.25
89.5
6.94
2.55
11.83
70.44
10.73
9.19
18.07
36.26
25.71
18.99
41.09
70.99
Accuracy
BLEU-s
METEOR
Rouge

Examples

Input	Output	Politeness Strategy
What happened to my personal station?	Could you please let me know what happened to my personal station?	***could*** and ***would*** are counterfactual forms which are polite
Yes, go ahead and remove it.	Yes, we can go ahead and remove it.	First person plural
Not yet - I'll try this weekend	Sorry, not yet - I'll try to make sure this weekend.	Apologizing

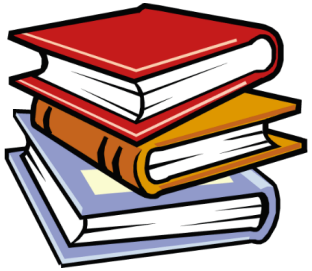
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

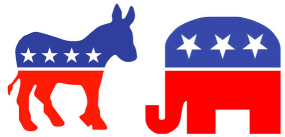
Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

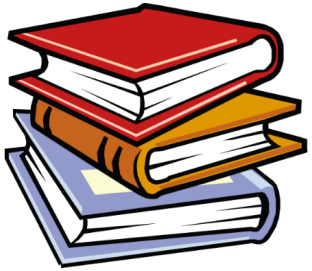
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

Content Transfer

After graduate form Columbia University, Obama worked in Chicago.

After graduating from Columbia University, Obama worked in Chicago.

After graduating from Carnegie Mellon University, Obama worked in Chicago.

After graduating from Columbia University, Obama worked in Chicago.

- AI assistance deals with *form* (grammar, style, etc.)
- Our goal is to control for *content*

What is our task?

What is our task?

Not logged in Talk Contributions Create account Log in

Article Talk Read Edit View history Search Wikipedia

WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Current events
Random article
About Wikipedia
Contact us
Donate

Contribute
Help
Community portal
Recent changes
Upload file

Tools
What links here
Related changes
Special pages

Monkey selfie copyright dispute

From Wikipedia, the free encyclopedia

The **monkey selfie copyright dispute** is a series of disputes about the copyright status of selfies taken by Celebes crested macaques using equipment belonging to the British nature photographer David Slater. The disputes involve Wikimedia Commons and the blog *Techdirt*, which have hosted the images following their publication in newspapers in July 2011 over Slater's objections that he holds the copyright, and People for the Ethical Treatment of Animals (PETA), who have argued that the macaque should be assigned the copyright.

Slater has argued that he has a valid copyright claim, as he engineered the situation that resulted in the pictures by travelling to Indonesia, befriending a group of wild macaques, and setting up his camera equipment in such a way that a "selfie" picture might come about. The Wikimedia Foundation's 2014 refusal to remove the pictures from its Wikimedia Commons image library was based on the understanding that copyright is held by the creator, that a non-human creator (not being a legal person) cannot hold copyright, and that the images are thus in the public domain.

One of the monkey selfies at issue

What is our task?

Not logged in Talk Contributions Create account Log in

Article Talk Read Edit View history Search Wikipedia

WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Current events
Random article
About Wikipedia
Contact us
Donate

Contribute
Help
Community portal
Recent changes
Upload file

Tools
What links here
Related changes
Special pages

Monkey selfie copyright dispute

From Wikipedia, the free encyclopedia

The **monkey selfie copyright dispute** is a series of disputes about the copyright status of selfies taken by Celebes crested macaques using equipment belonging to the British nature photographer David Slater. The disputes involve Wikimedia Commons and the blog *Techdirt*, which have hosted the images following their publication in newspapers in July 2011 over Slater's objections that he holds the copyright, and People for the Ethical Treatment of Animals (PETA), who have argued that the macaque should be assigned the copyright.

Slater has argued that he has a valid copyright claim, as he engineered the situation that resulted in the pictures by travelling to Indonesia, befriending a group of wild macaques, and setting up his camera equipment in such a way that a "selfie" picture might come about. The Wikimedia Foundation's 2014 refusal to remove the pictures from its Wikimedia Commons image library was based on the understanding that copyright is held by the creator, that a non-human creator (not being a legal person) cannot hold copyright, and that the images are thus in the public domain.

One of the monkey selfies at issue

Amateur Photographer

Subscribe now Digital

Latest Opinion Reviews How To Inspiration AP Awards The Video Mode

Home / Latest / Latest news

Ape-rture priority photographer plays down monkey reports

Chris Cheesman
July 5, 2011

0 shares

A photographer who says he witnessed monkeys taking pictures of themselves, tells Amateur Photographer (AP) that much of the media coverage has been exaggerated.

Wildlife photographer David Slater today played down newspaper reports that suggest a bunch of Indonesian monkeys grabbed his camera and began taking self-portraits.

And he revealed that the shots, featuring the endangered crested black macaque monkey, were taken three years ago.

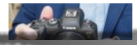
Speaking to AP, David explained that his camera had been mounted on a tripod when the primates

Latest reviews

Leica M10-R review

Andy Westlake takes a detailed look at Leica's latest high-resolution...

Canon EOS R6 review: hands-on first look



Look out Sony - Canon may just have got full-

What is our task?

Not logged in Talk Contributions Create account Log in

Article Talk Read Edit View history Search Wikipedia

WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Current events
Random article
About Wikipedia
Contact us
Donate

Contribute
Help
Community portal
Recent changes
Upload file

Tools
What links here
Related changes
Special pages

Monkey selfie copyright dispute

From Wikipedia, the free encyclopedia

The **monkey selfie copyright dispute** is a series of disputes about the copyright status of selfies taken by Celebes crested macaques using equipment belonging to the British nature photographer David Slater. The disputes involve Wikimedia Commons and the blog *Techdirt*, which have hosted the images following their publication in newspapers in July 2011 over Slater's objections that he holds the copyright, and People for the Ethical Treatment of Animals (PETA), who have argued that the macaque should be assigned the copyright.

Slater has argued that he has a valid copyright claim, as he engineered the situation that resulted in the pictures by travelling to Indonesia, befriending a group of wild macaques, and setting up his camera equipment in such a way that a "selfie" picture might come about. The Wikimedia Foundation's 2014 refusal to remove the pictures from its Wikimedia Commons image library was based on the understanding that copyright is held by the creator, that a non-human creator (not being a legal person) cannot hold copyright, and that the images are thus in the public domain.

One of the monkey selfies at issue

Amateur Photographer

Subscribe now Digital

Latest Opinion Reviews How To Inspiration AP Awards The Video Mode

Home / Latest / Latest news

Ape-rture priority photographer plays down monkey reports

Chris Cheesman
July 5, 2011

0 shares

A photographer who says he witnessed monkeys taking pictures of themselves, tells Amateur Photographer (AP) that much of the media coverage has been exaggerated.

Wildlife photographer David Slater today played down newspaper reports that suggest a bunch of Indonesian monkeys grabbed his camera and began taking self-portraits.

And he revealed that the shots, featuring the endangered crested black macaque monkey, were taken three years ago.

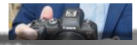
Speaking to AP, David explained that his camera had been mounted on a tripod when the primates

Latest reviews

Leica M10-R review

Andy Westlake takes a detailed look at Leica's latest high-resolution...

Canon EOS R6 review: hands-on first look



Look out Sony - Canon may just have got full-

The following day, *Amateur Photographer* reported that Slater gave them further explanation as to how the photographs were created, downplaying the way newspaper articles had described them; Slater said reports that a monkey ran off with his camera and "began taking self-portraits" were incorrect and that the portrait was shot when his camera had been mounted on a tripod, with the primates playing around with a remote cable release as he fended off other monkeys.[13]

What is our task?

Not logged in Talk Contributions Create account Log in

Article Talk Read Edit View history Search Wikipedia

WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Current events
Random article
About Wikipedia
Contact us
Donate

Contribute
Help
Community portal
Recent changes
Upload file

Tools
What links here
Related changes
Special pages

Monkey selfie copyright dispute

From Wikipedia, the free encyclopedia

The **monkey selfie copyright dispute** is a series of disputes about the copyright status of selfies taken by Celebes crested macaques using equipment belonging to the British nature photographer David Slater. The disputes involve Wikimedia Commons and the blog *Techdirt*, which have hosted the images following their publication in newspapers in July 2011 over Slater's objections that he holds the copyright, and People for the Ethical Treatment of Animals (PETA), who have argued that the macaque should be assigned the copyright.

Slater has argued that he has a valid copyright claim, as he engineered the situation that resulted in the pictures by travelling to Indonesia, befriending a group of wild macaques, and setting up his camera equipment in such a way that a "selfie" picture might come about. The Wikimedia Foundation's 2014 refusal to remove the pictures from its Wikimedia Commons image library was based on the understanding that copyright is held by the creator, that a non-human creator (not being a legal person) cannot hold copyright, and that the images are thus in the public domain.

One of the monkey selfies at issue

Amateur Photographer

Subscribe now Digital

Latest Opinion Reviews How To Inspiration AP Awards The Video Mode

Home / Latest / Latest news

Ape-rture priority photographer plays down monkey reports

Chris Cheesman
July 5, 2011

0 shares

A photographer who says he witnessed monkeys taking pictures of themselves, tells Amateur Photographer (AP) that much of the media coverage has been exaggerated.

Wildlife photographer David Slater today played down newspaper reports that suggest a bunch of Indonesian monkeys grabbed his camera and began taking self-portraits.

And he revealed that the shots, featuring the endangered crested black macaque monkey, were taken three years ago.

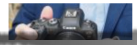
Speaking to AP, David explained that his camera had been mounted on a tripod when the primates

Latest reviews

Leica M10-R review

Andy Westlake takes a detailed look at Leica's latest high-resolution...

Canon EOS R6 review: hands-on first look



Look out Sony - Canon may just have got full-

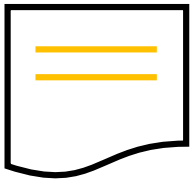
The following day, *Amateur Photographer* reported that Slater gave them further explanation as to how the photographs were created, downplaying the way newspaper articles had described them; Slater said reports that a monkey ran off with his camera and "began taking self-portraits" were incorrect and that the portrait was shot when his camera had been mounted on a tripod, with the primates playing around with a remote cable release as he fended off other monkeys.[13]

Generate text that is:

- coherent to the Wikipedia context
- contains latest event from the article

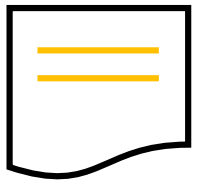
Primary Contribution

Primary Contribution



curated text (context)

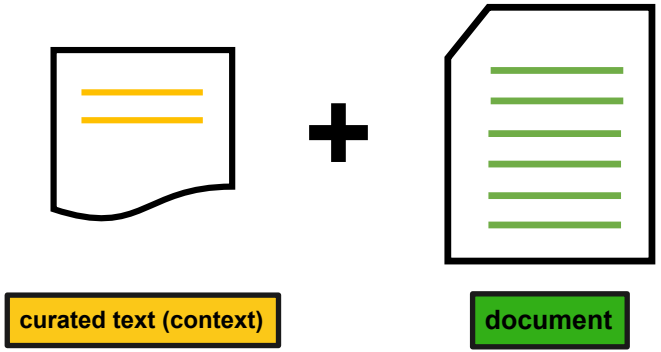
Primary Contribution



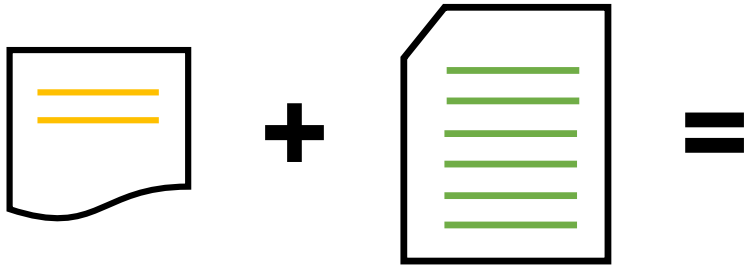
+

curated text (context)

Primary Contribution

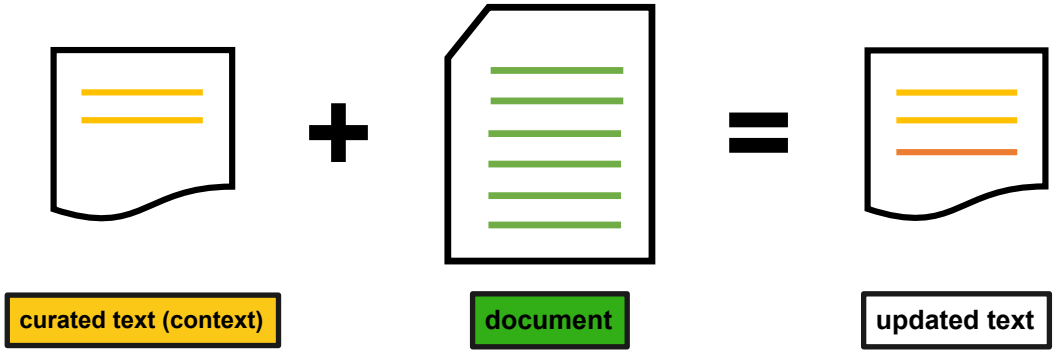


Primary Contribution



Primary Contribution

Primary Contribution

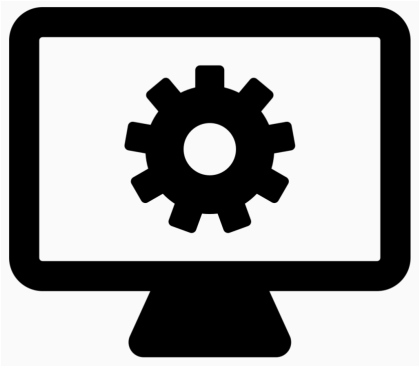


- design a task to perform content transfer from an unstructured source of information
- release dataset

Applications

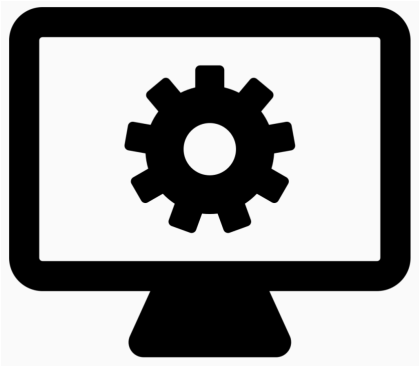
Applications

Software Documentation



Applications

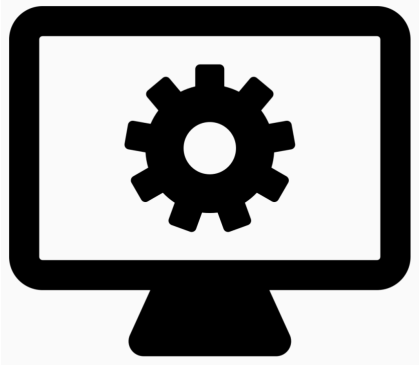
Software Documentation



Inbox Summarization

Applications

Software Documentation

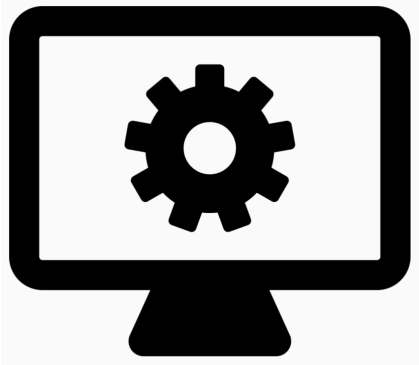


Inbox Summarization

Legal Document

Applications

Software Documentation



Wikipedia Articles

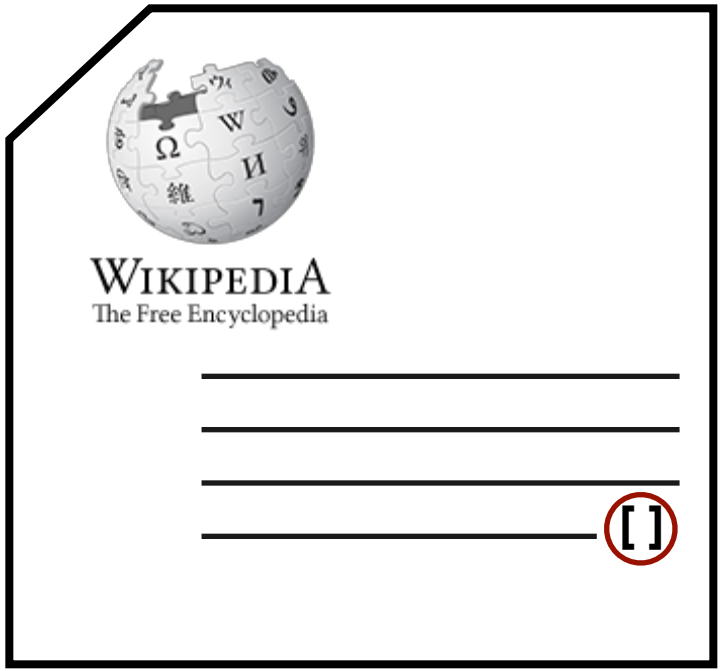
Inbox Summarization

Legal Document

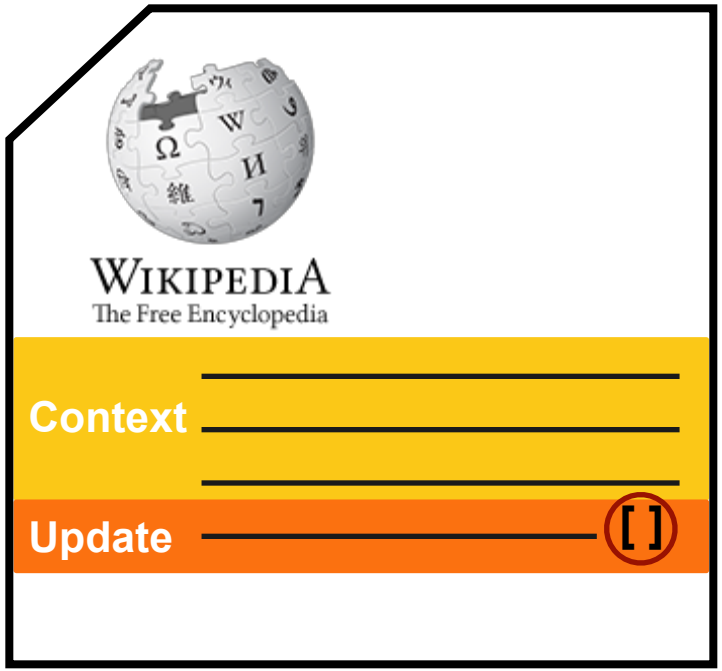
Data Creation Process

Data Creation Process

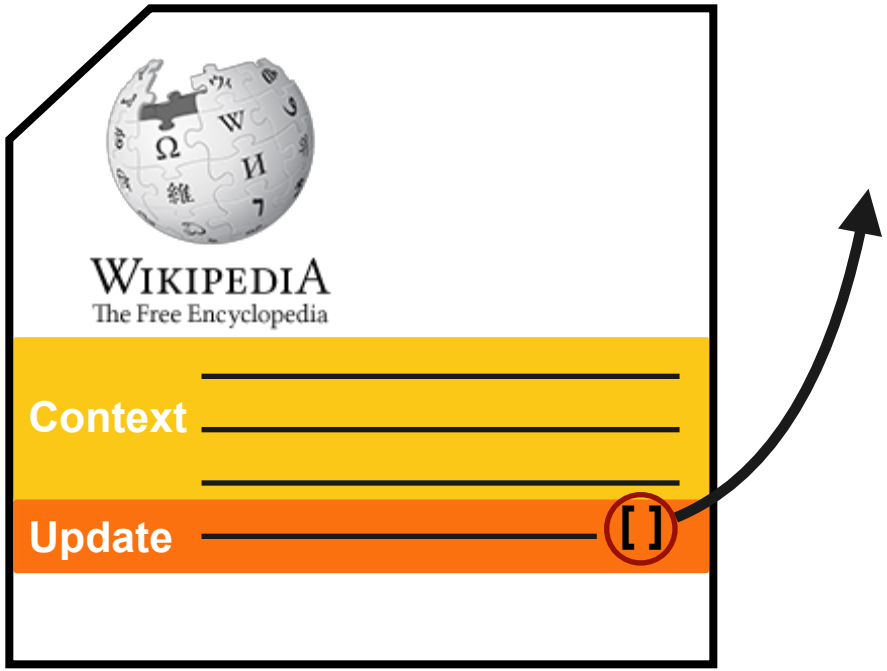
Data Creation Process



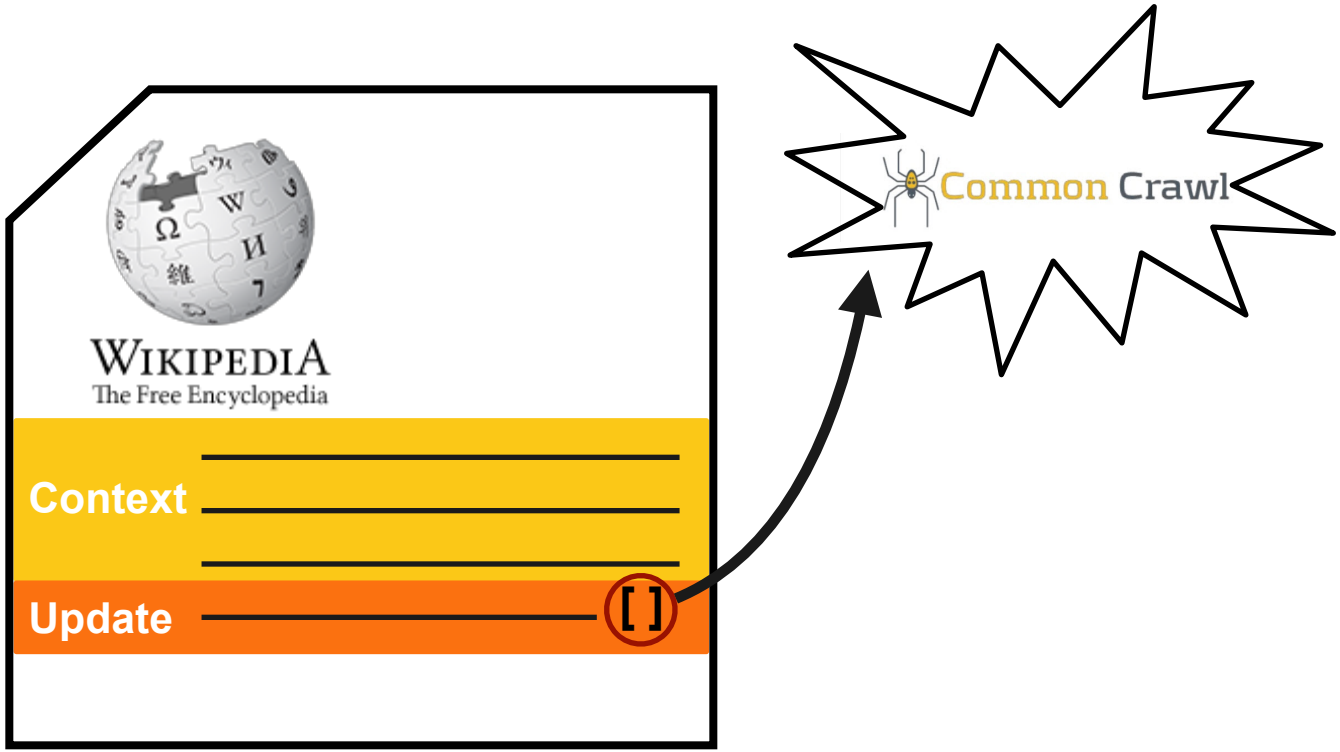
Data Creation Process



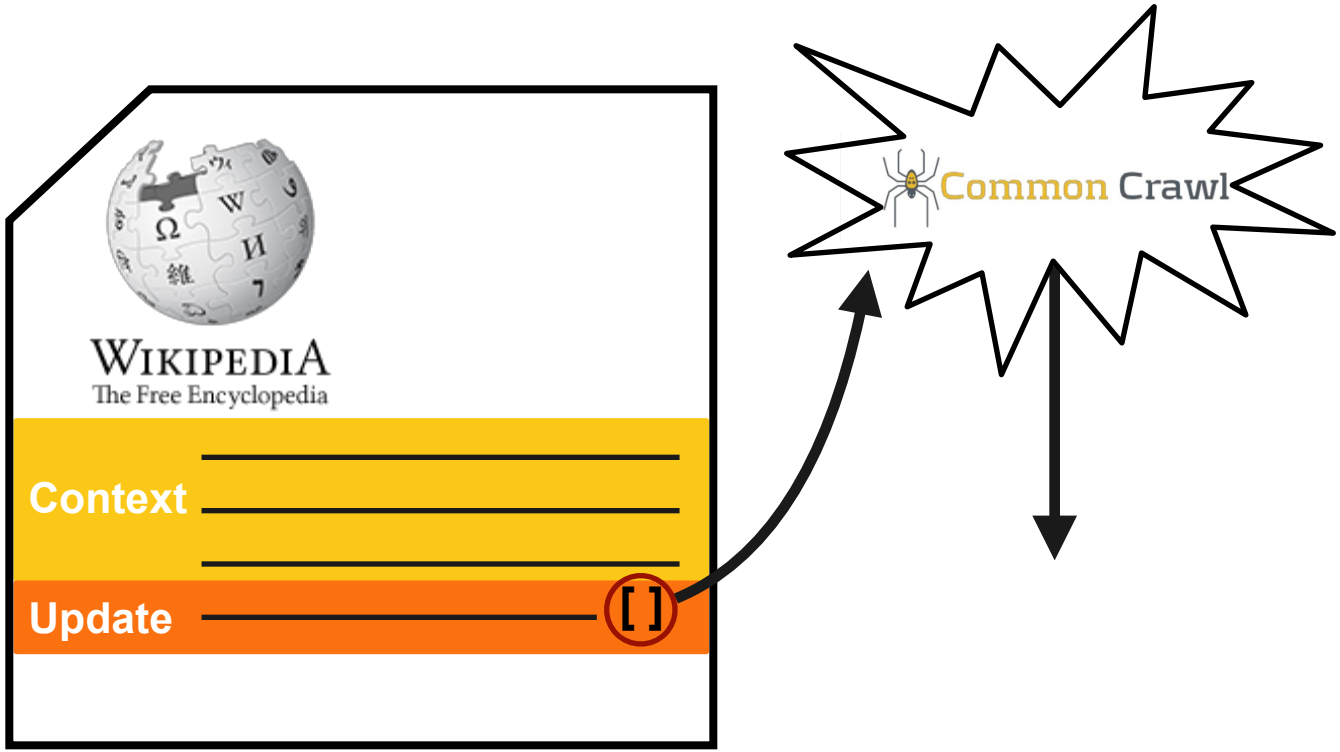
Data Creation Process



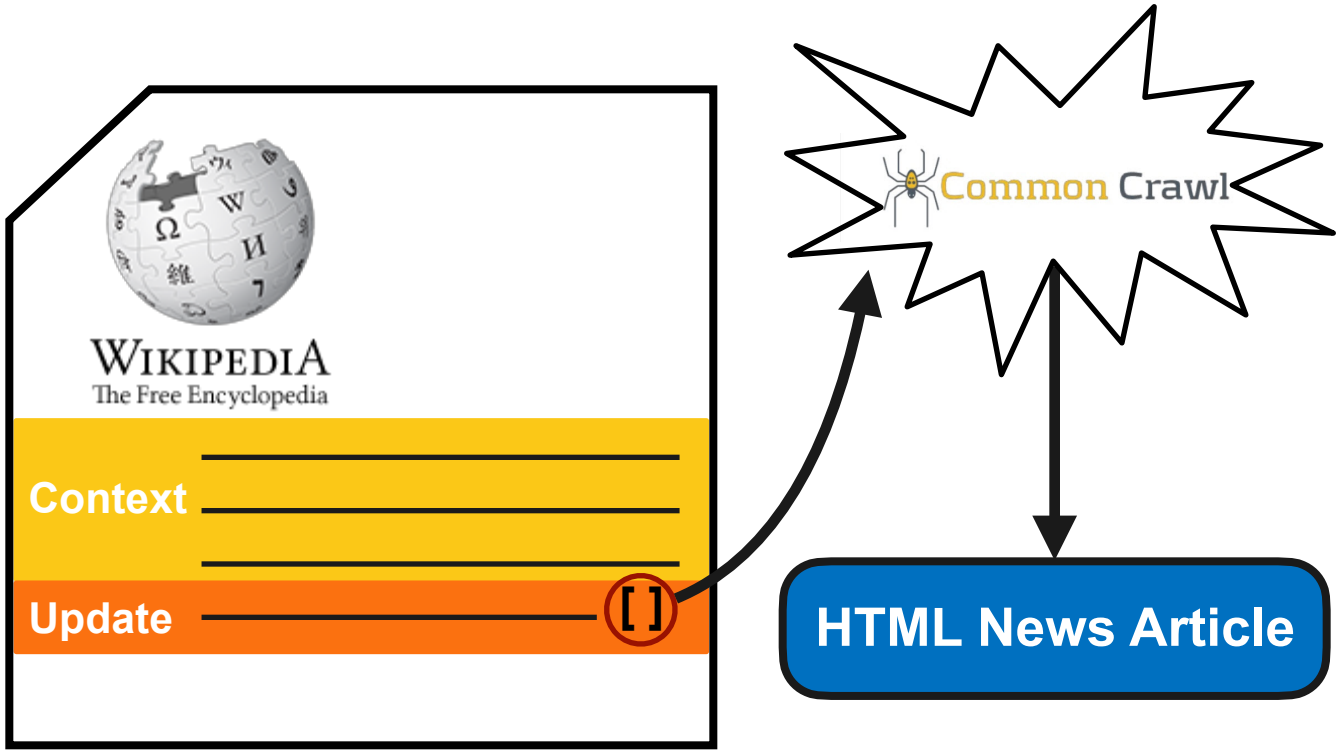
Data Creation Process



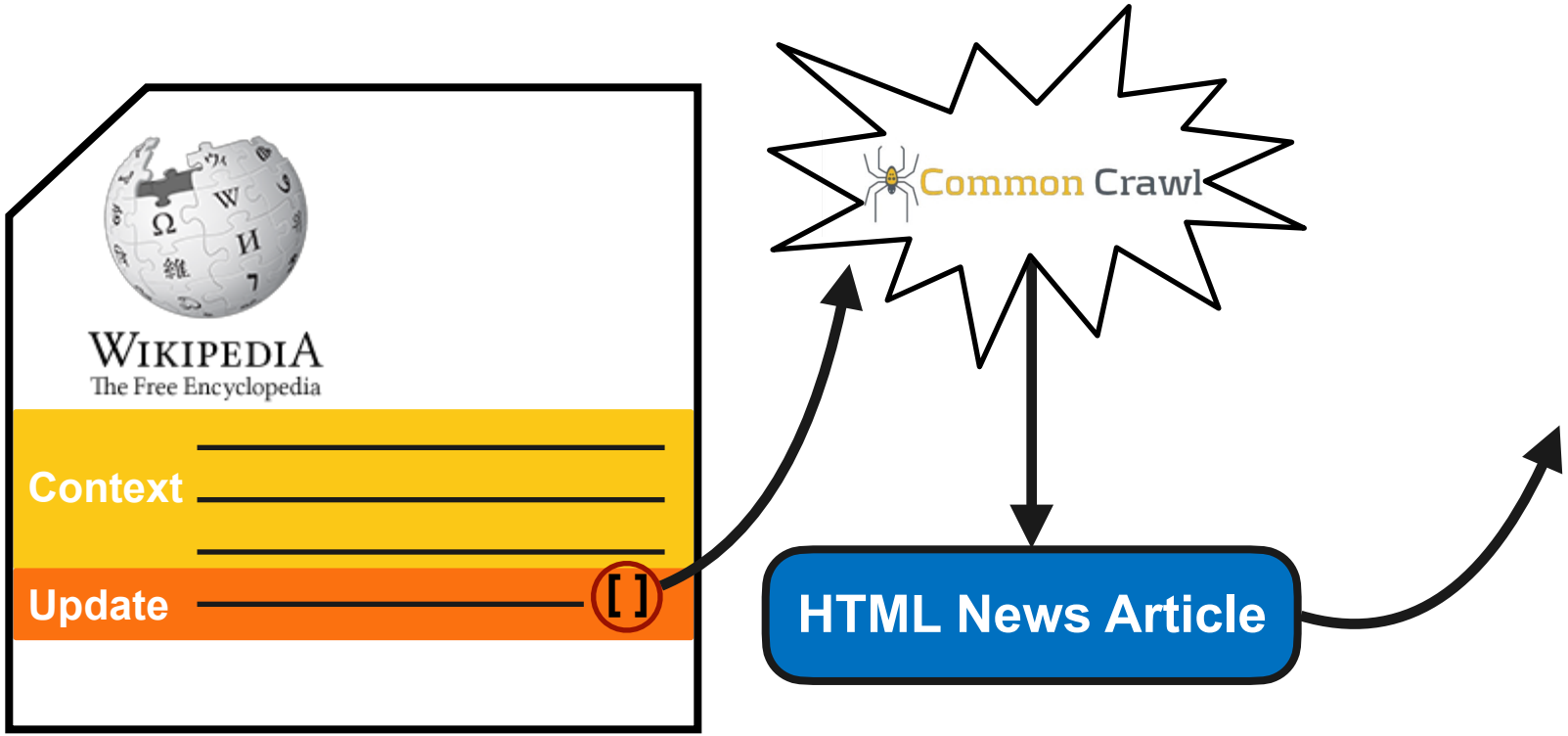
Data Creation Process



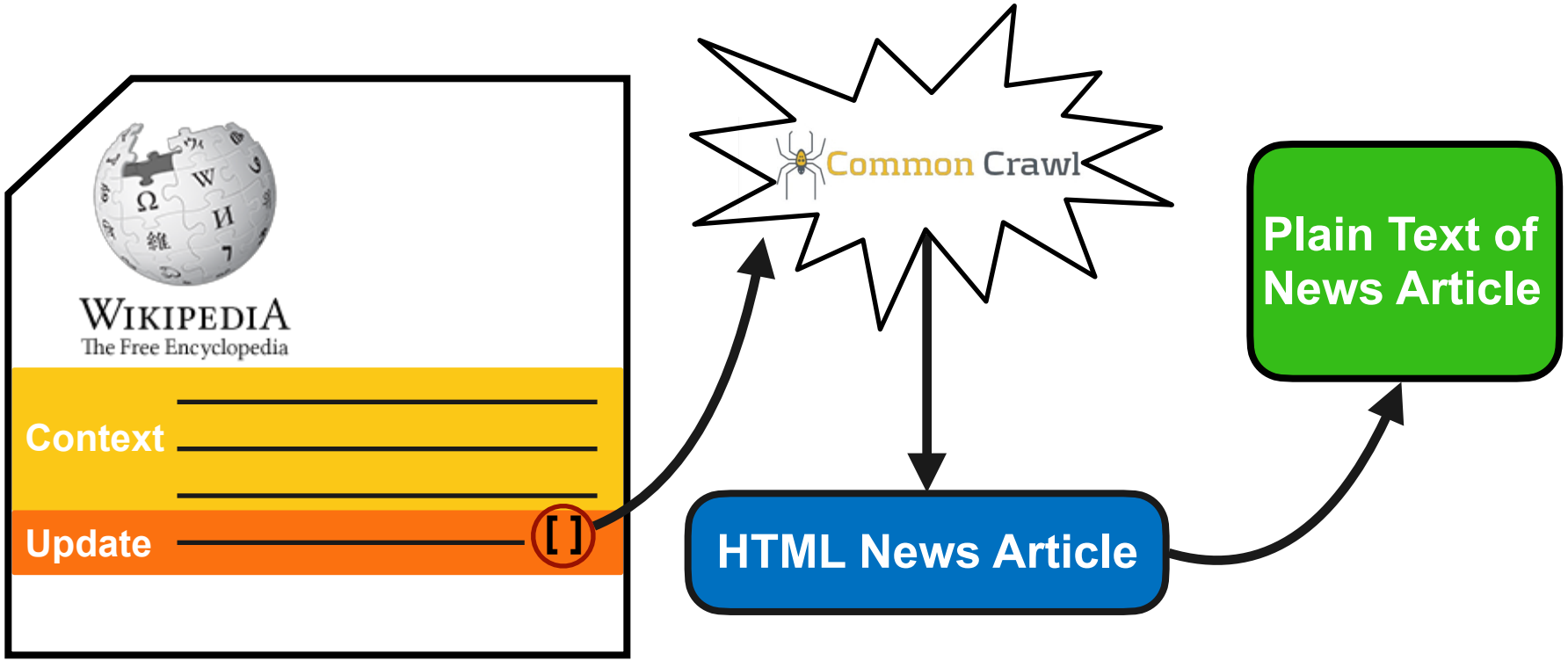
Data Creation Process



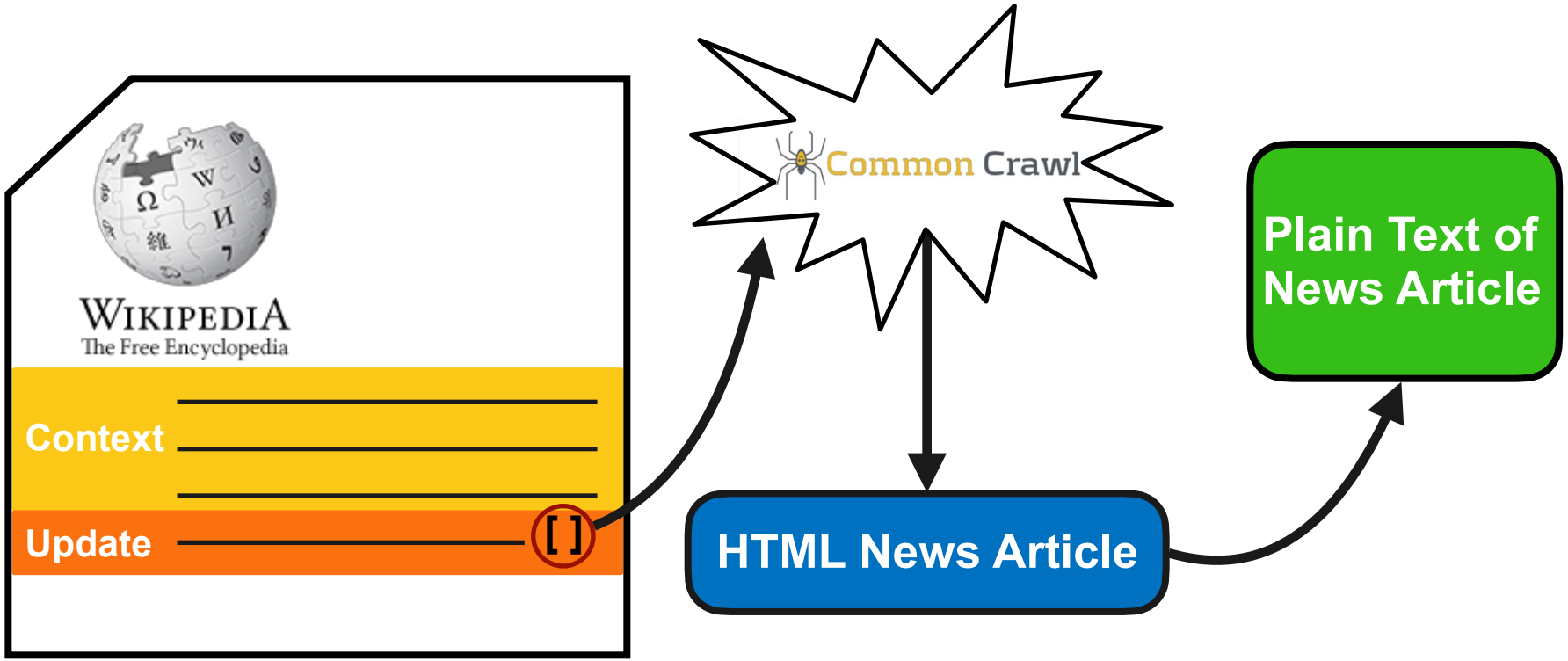
Data Creation Process



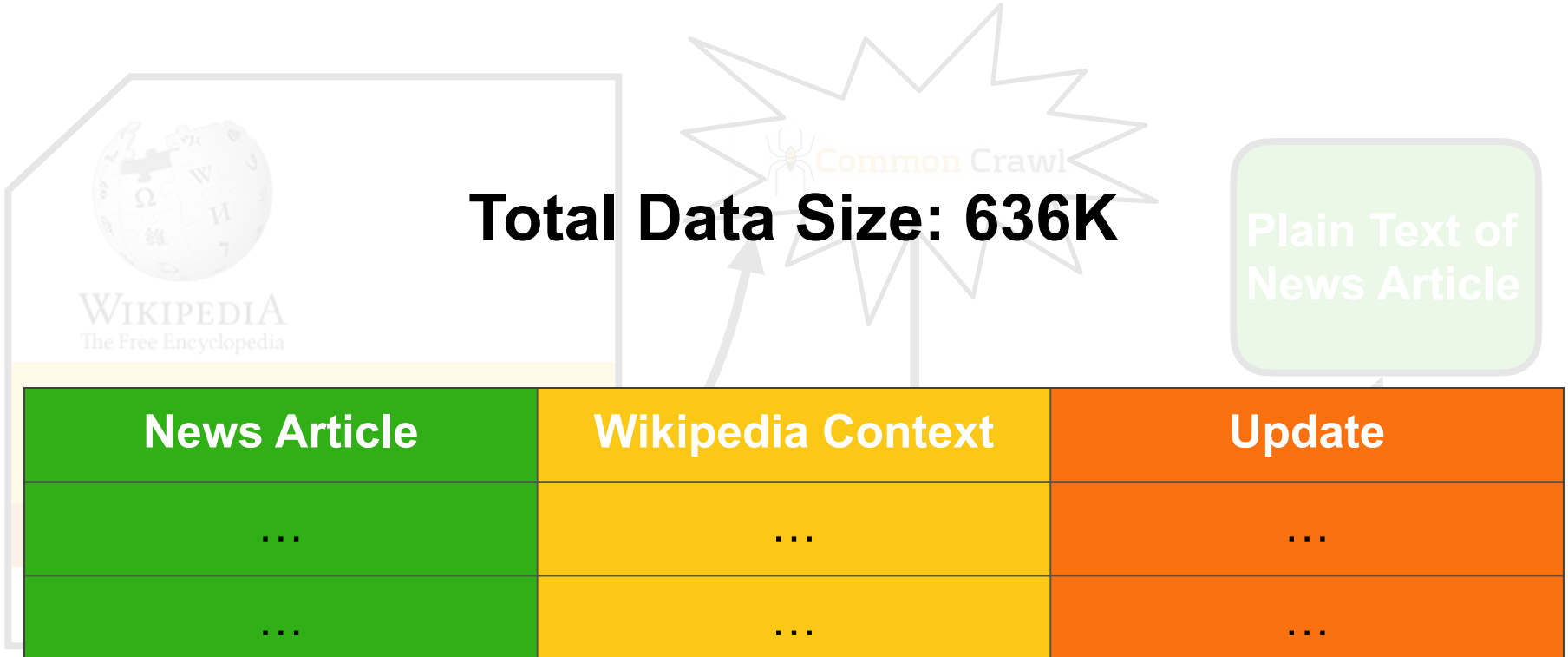
Data Creation Process



Data Creation Process



Data Creation Process



Total Data Size: 636K

News Article	Wikipedia Context	Update
…	…	…
…	…	…

Models

Generative Models

- Context Agnostic Generative Model (CAG) — Baseline
- Context Informed Generative Model (CIG)
- Context Responsive Generative Model (CRG)

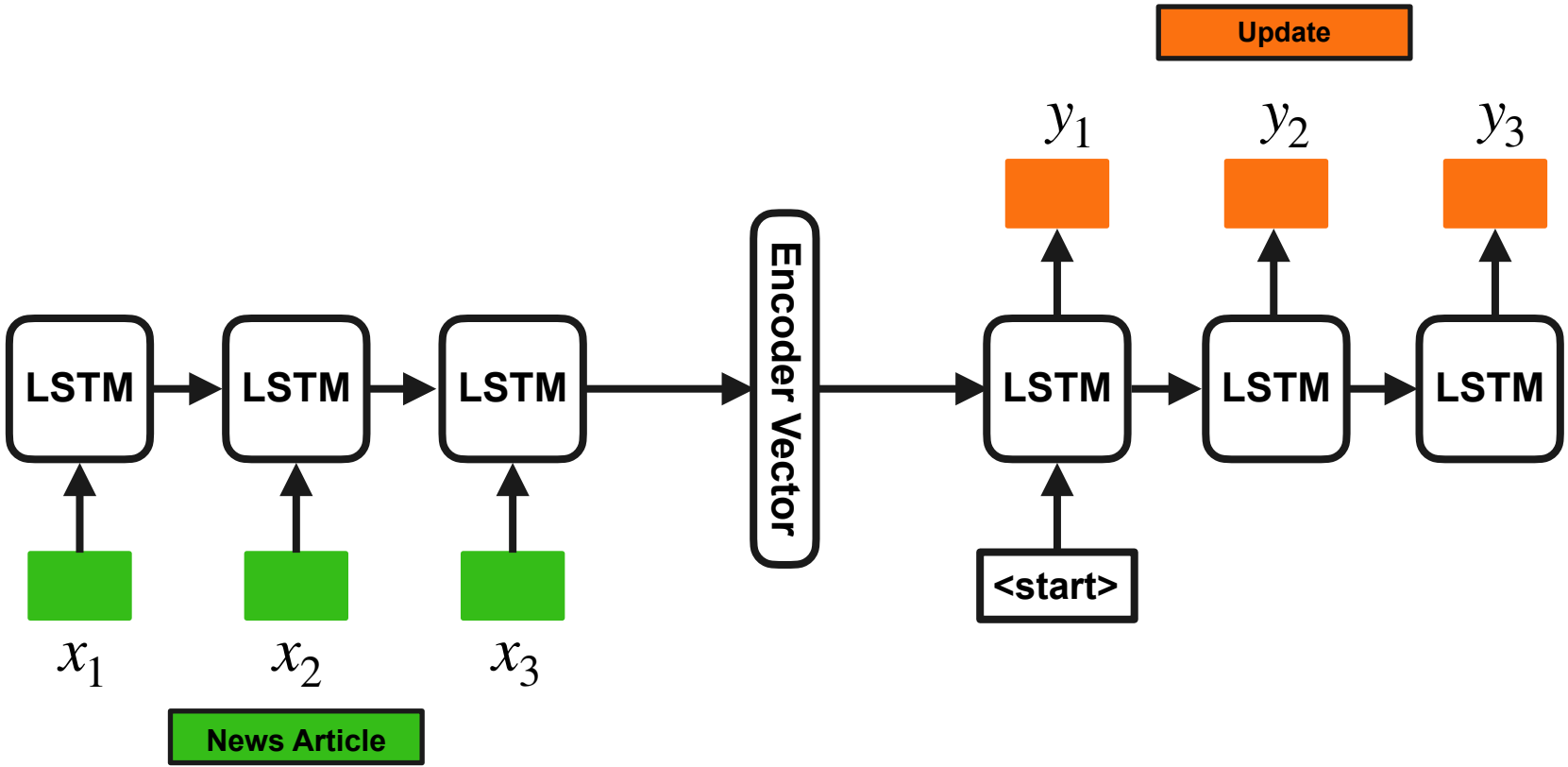
all models have global attention

Extractive Models

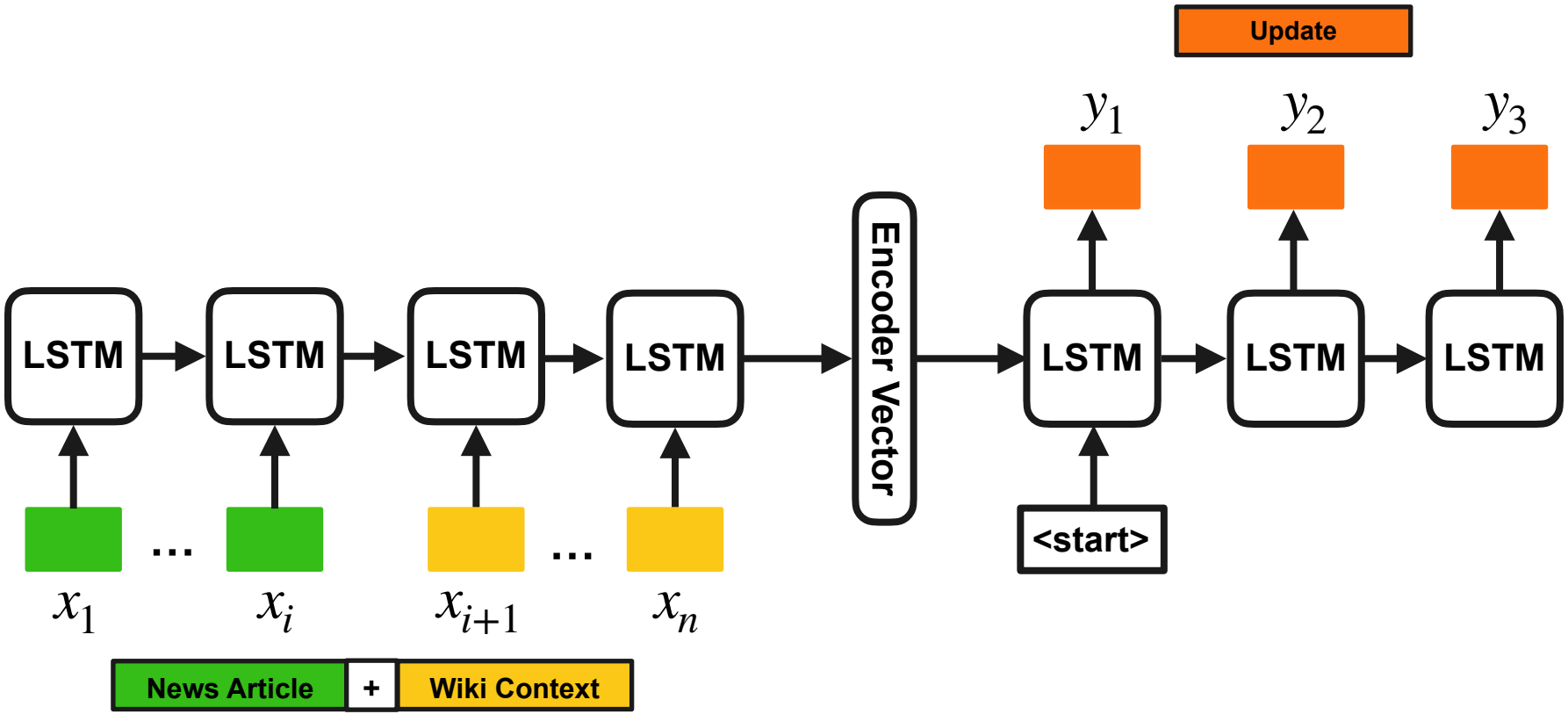
- SumBasic
- Context Informed SumBasic
- Oracle

all models are simplistic to infer if context helps in generation

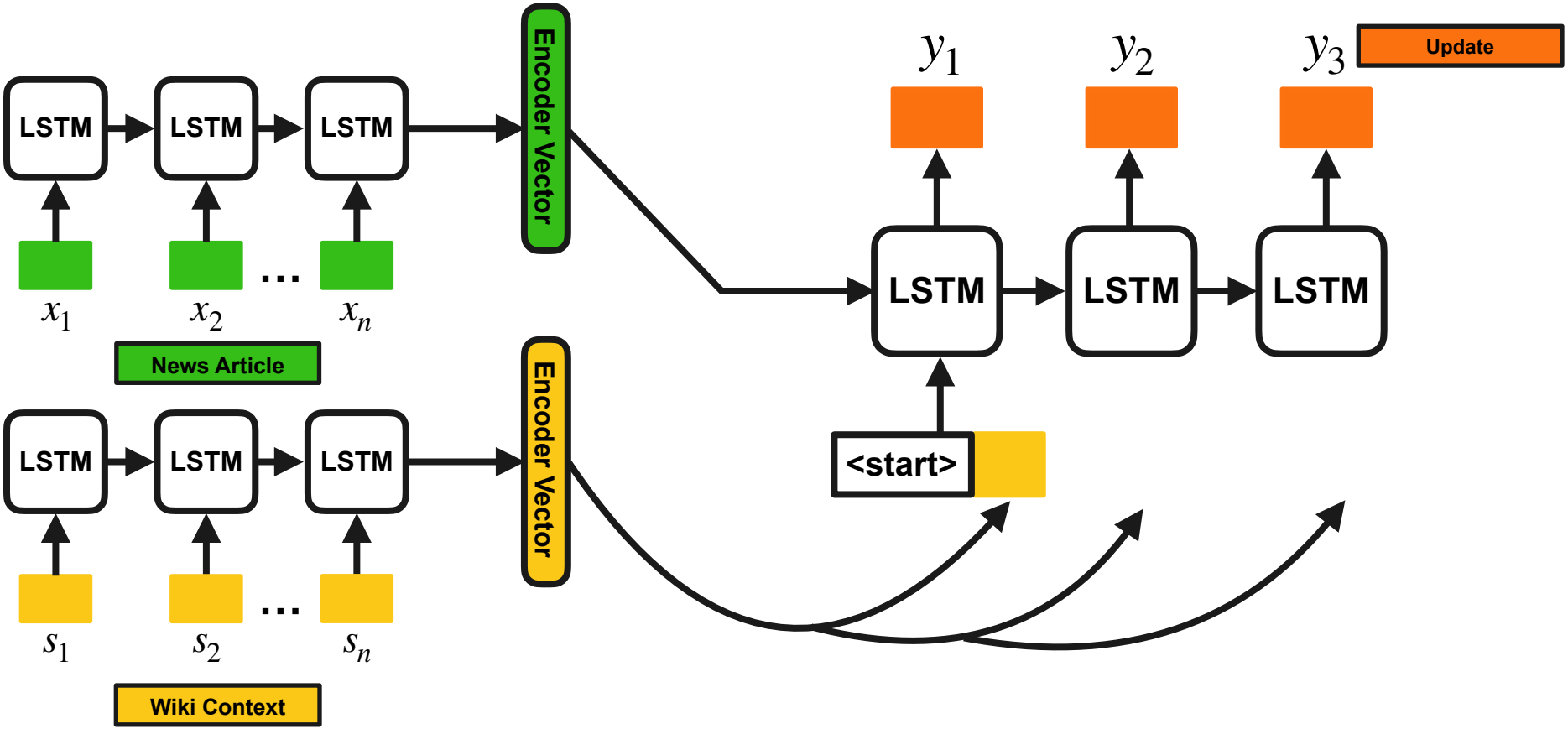
Context Agnostic Model (CAG) - Baseline



Context Informed Model (CIG)



Context Receptive Model (CRG)

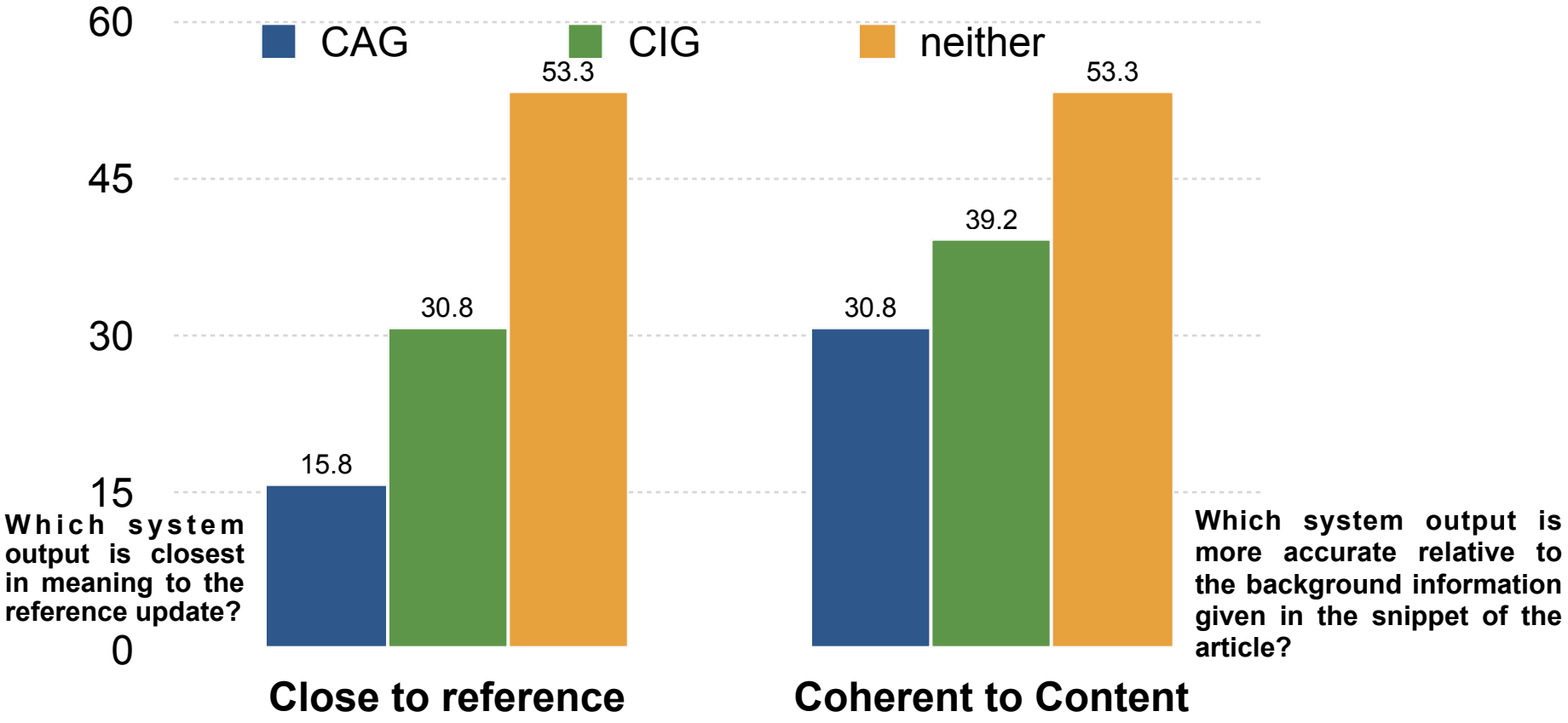


Automated Evaluation

Model	ROUGE-L
SumBasic	5.6 (5.6-5.7)
Context Informed SumBasic	7.0 (7.0-7.1)
Context Agnostic Generative Model	9.1 (9.0-9.2)
Context Informed Generative Model	**16.0 (15.9-16.1)**
Context Receptive Generative Model	14.7 (14.6-14.8)
Oracle	28.8 (28.7-29.0)

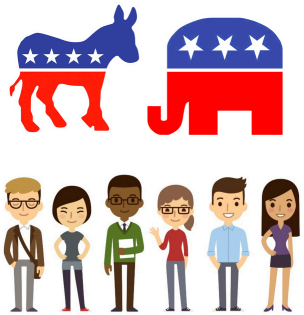
* METEOR and BLEU numbers are consistent with ROUGE-L

Relative Human Evaluation



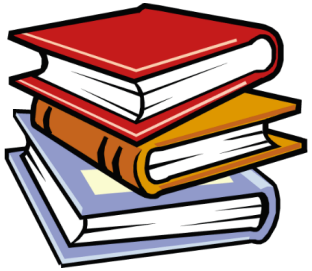
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

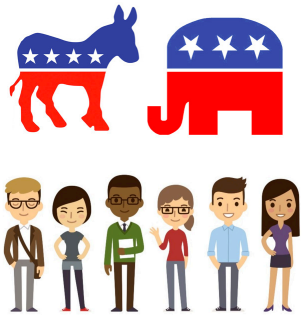
Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

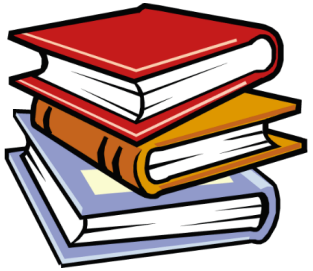
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

Sentence Ordering Task

Sentence Ordering Task

Before

Ironman steals the Infinity Stones back from Thanos and uses them to disintegrate Thanos and his army, at the cost of his life.

Hulk travels to New York City in 2012 and convinces the Ancient One to give him the Time Stone.

Thor decapitates Thanos.

Five years later, AntMan escapes from the quantum realm.

Ironman builds a time machine to save the world.

Sentence Ordering Task

Before

- Ironman steals the Infinity Stones back from Thanos and uses them to disintegrate Thanos and his army, at the cost of his life.
- Hulk travels to New York City in 2012 and convinces the Ancient One to give him the Time Stone.
- Thor decapitates Thanos.
- Five years later, AntMan escapes from the quantum realm.
- Ironman builds a time machine to save the world.

After

- Thor decapitates Thanos.
- Five years later, AntMan escapes from the quantum realm.
- Ironman builds a time machine to save the world.
- Hulk travels to New York City in 2012 and convinces the Ancient One to give him the Time Stone.
- Ironman steals the Infinity Stones back from Thanos and uses them to disintegrate Thanos and his army, at the cost of his life.

Methodology

- Constraint Solving Problem vs Sequence Prediction Task
- For a document with n sentences $(\{s_1 \ldots s_n\})$
  - $|\mathscr{C}| = \binom{n}{2}$ constraints
  - Predicted constraints of the form $s_1 < s_2$
  - 4 sentences in a document then 6 constraints
    - $\{s_1 < s_2, s_1 < s_3, s_1 < s_4, s_2 < s_3, s_2 < s_4, s_3 < s_4\}$
  - Topological sort to find an order given $\mathscr{C}$
    - Graph: $s_1 \rightarrow s_2$ if $s_1 < s_2$

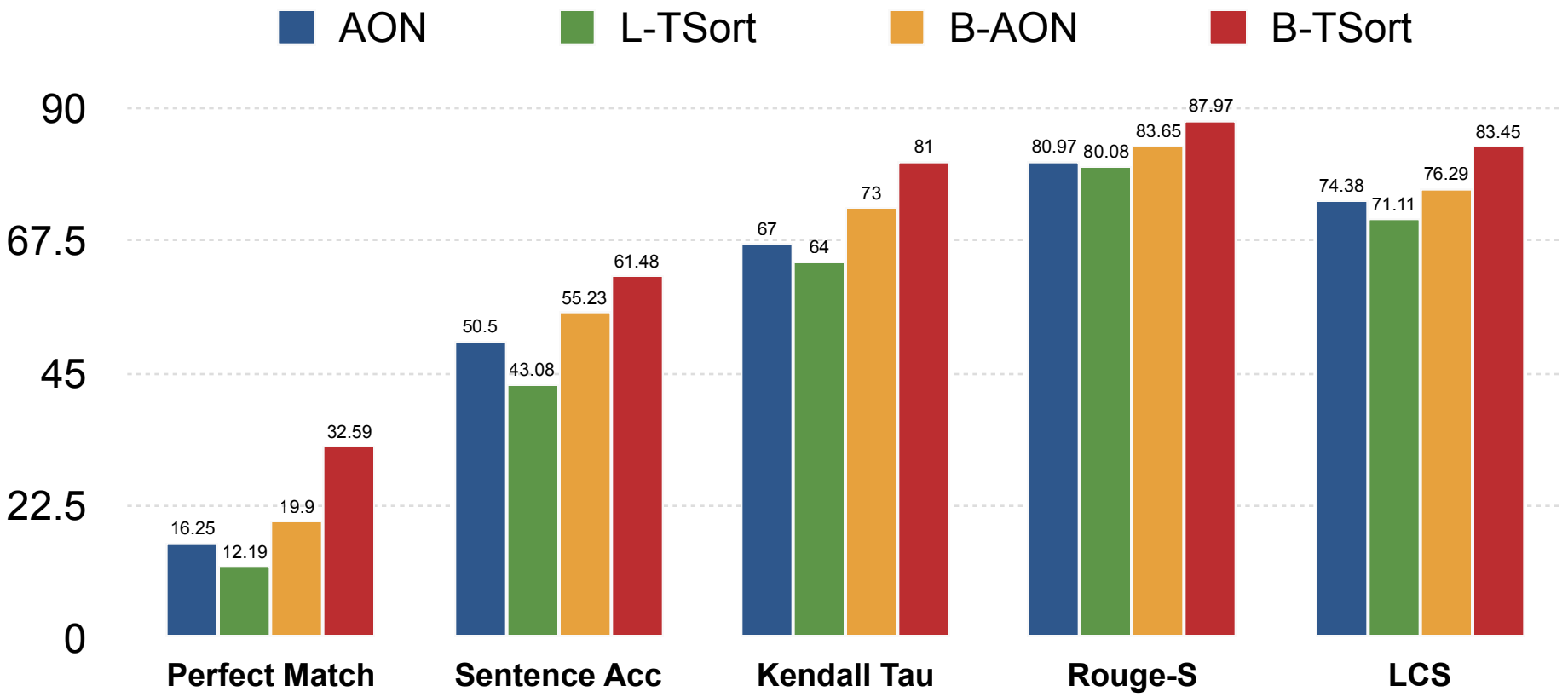
Constraint Learning

- ***BERT based Representation (B-TSort)***
  - Next Sentence Prediction
  - MLP(BERT(s_1[SEP]s_2))
- ***LSTM based Representation (L-TSort)***
  - $\mathbf{h}_1 = LSTM(s_1); \mathbf{h}_2 = LSTM(s_2)$
  - MLP($[\mathbf{h}_1; \mathbf{h}_2]$)

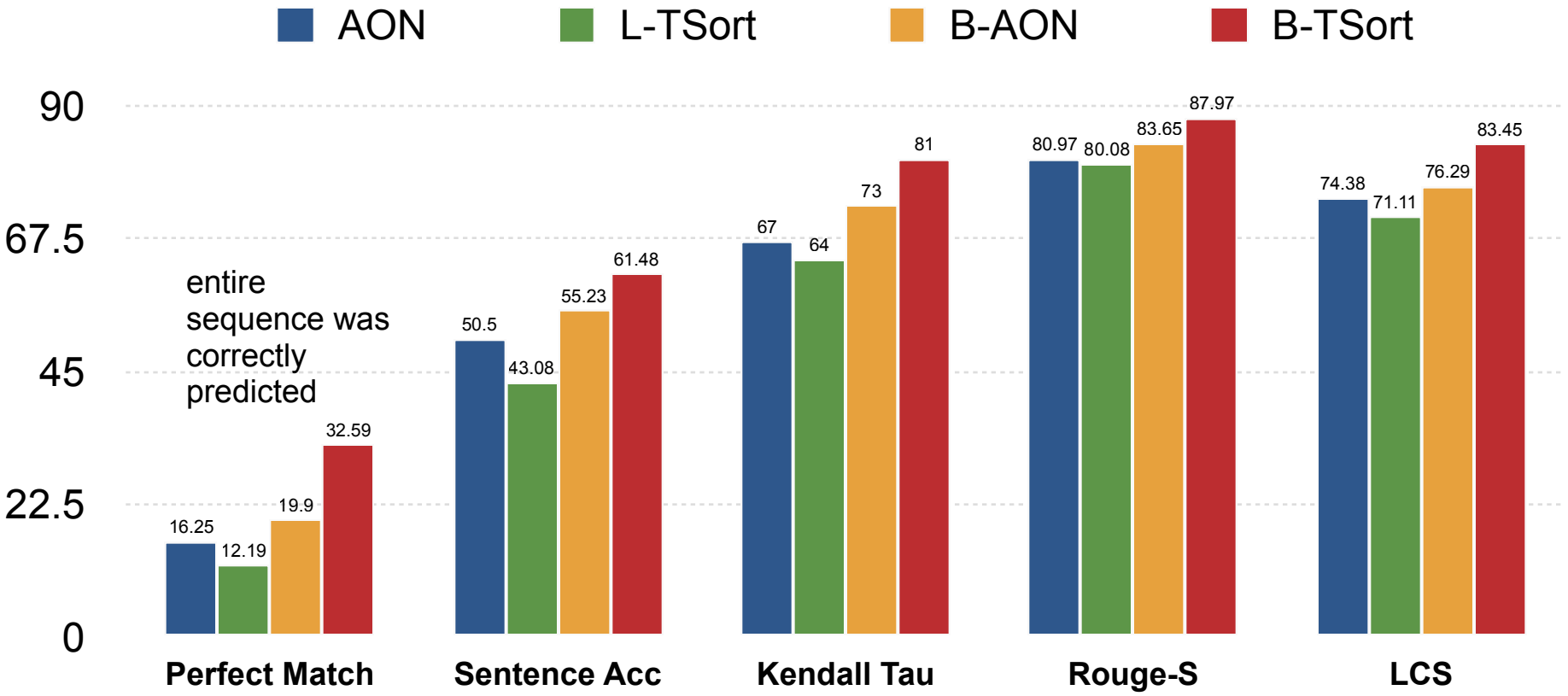
Baselines

- ***Attention Order Network (AON)***
  - LSTM: sentence representation
  - Transformer: document representation
  - LSTM decoder: generate order
- ***BERT Attention Order Network (B-AON)***
  - BERT: sentence representation

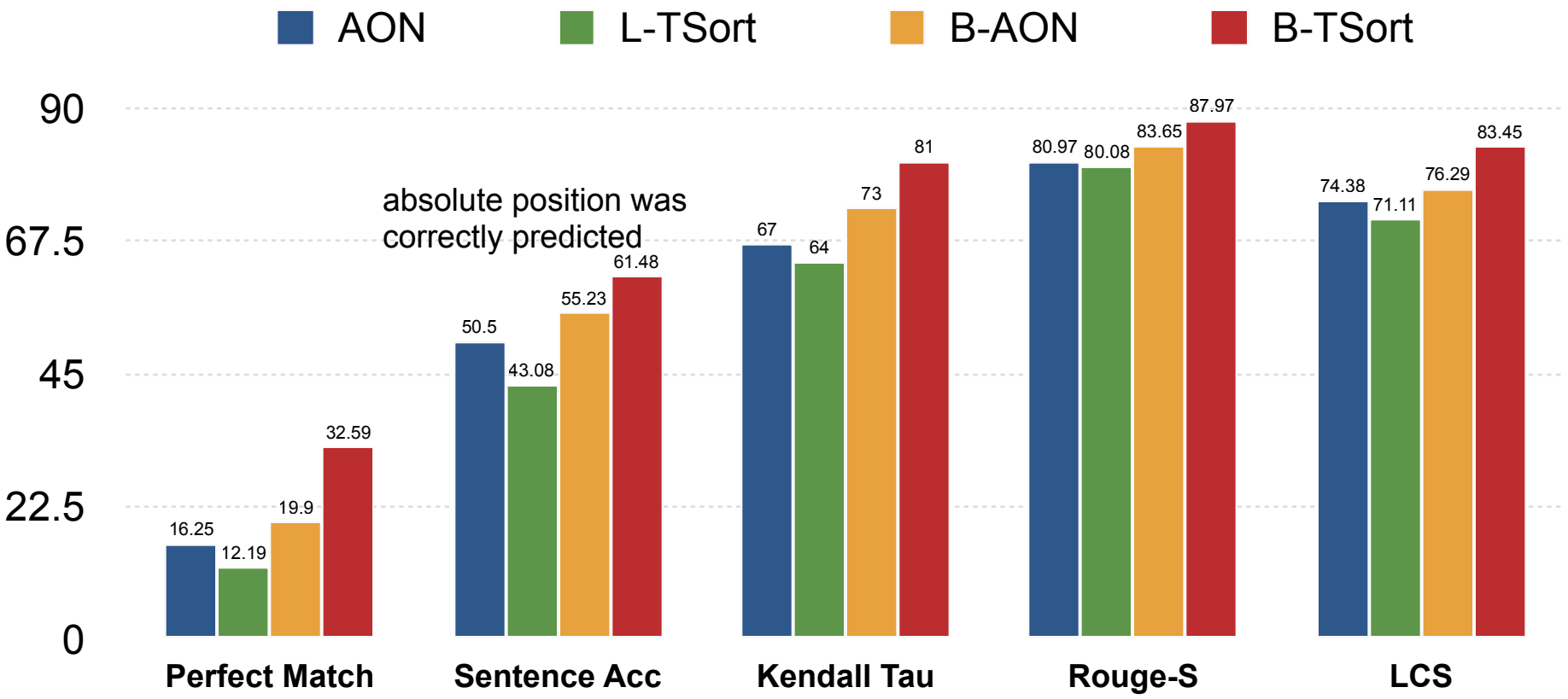
Results for NIPS abstracts



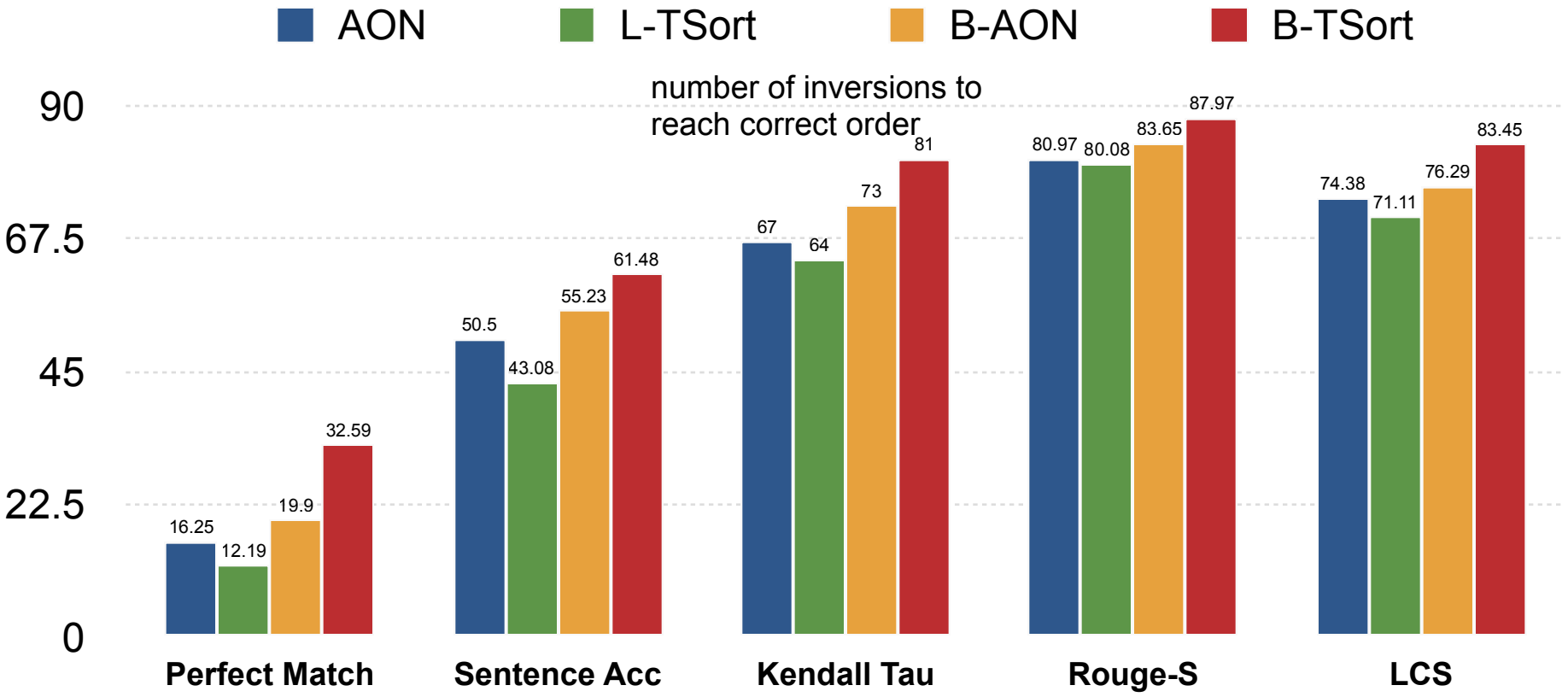
Results for NIPS abstracts



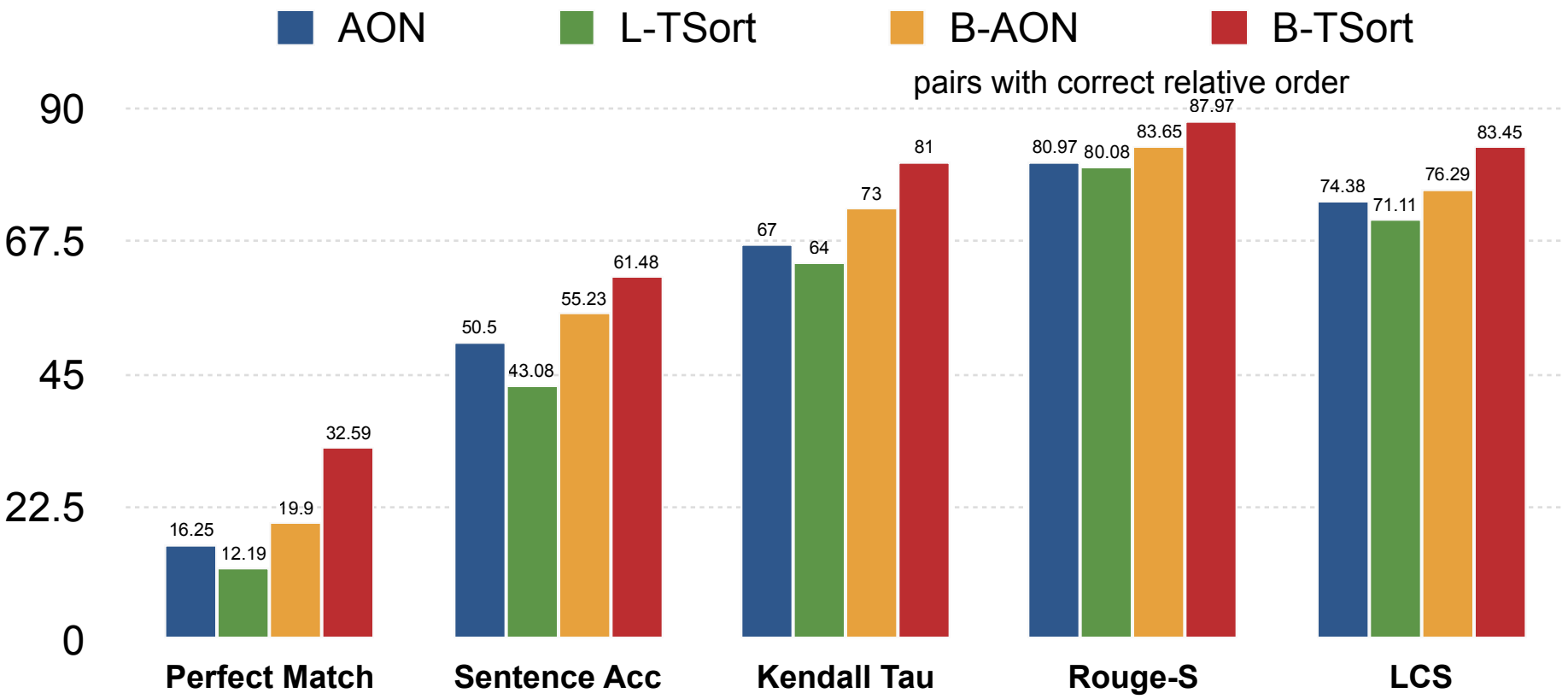
Results for NIPS abstracts



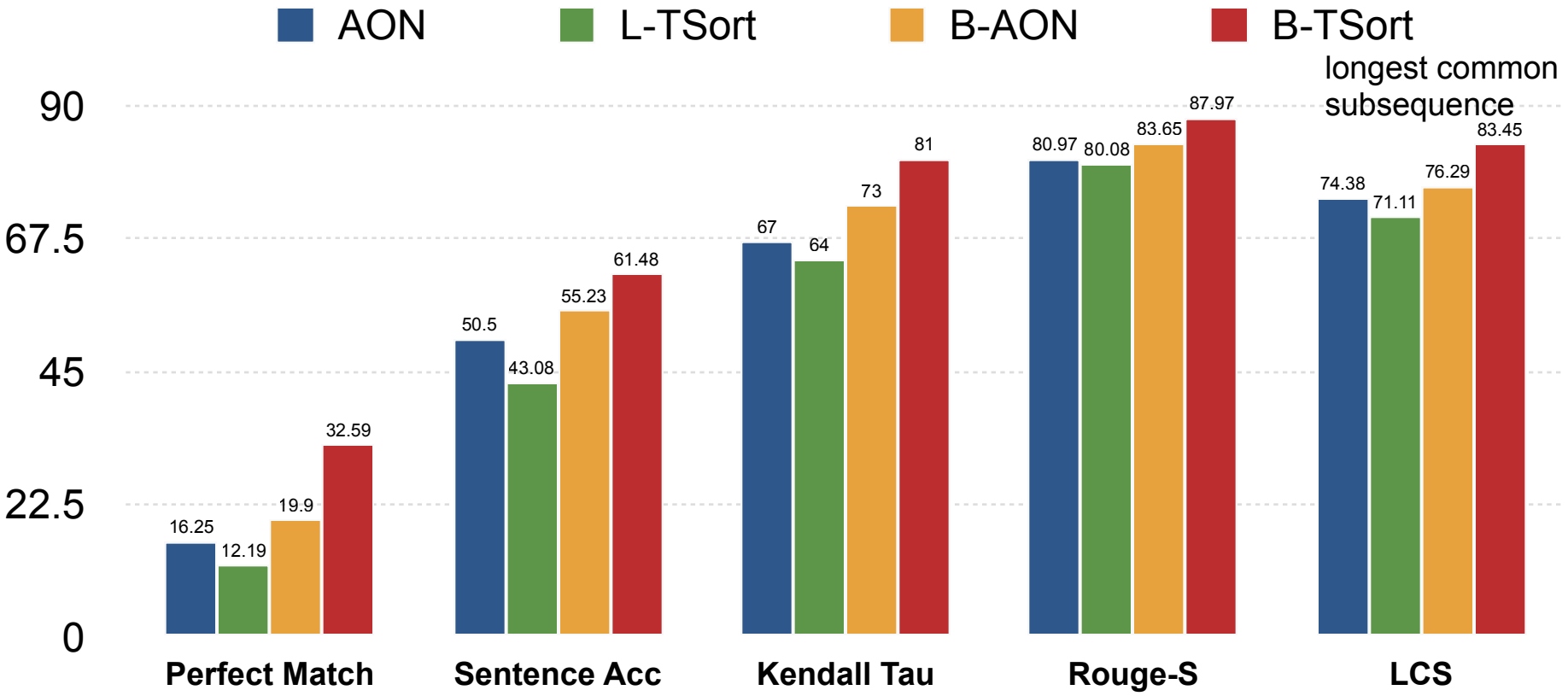
Results for NIPS abstracts



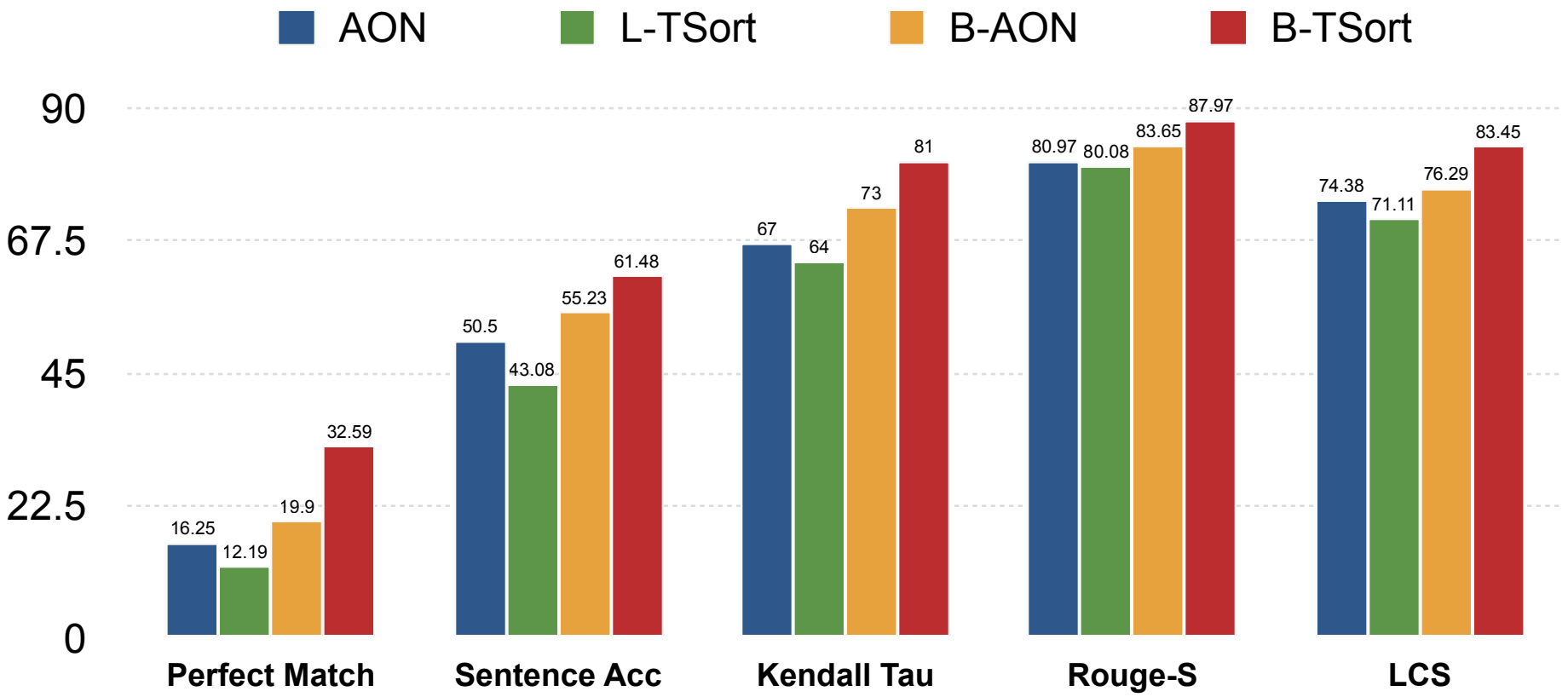
Results for NIPS abstracts



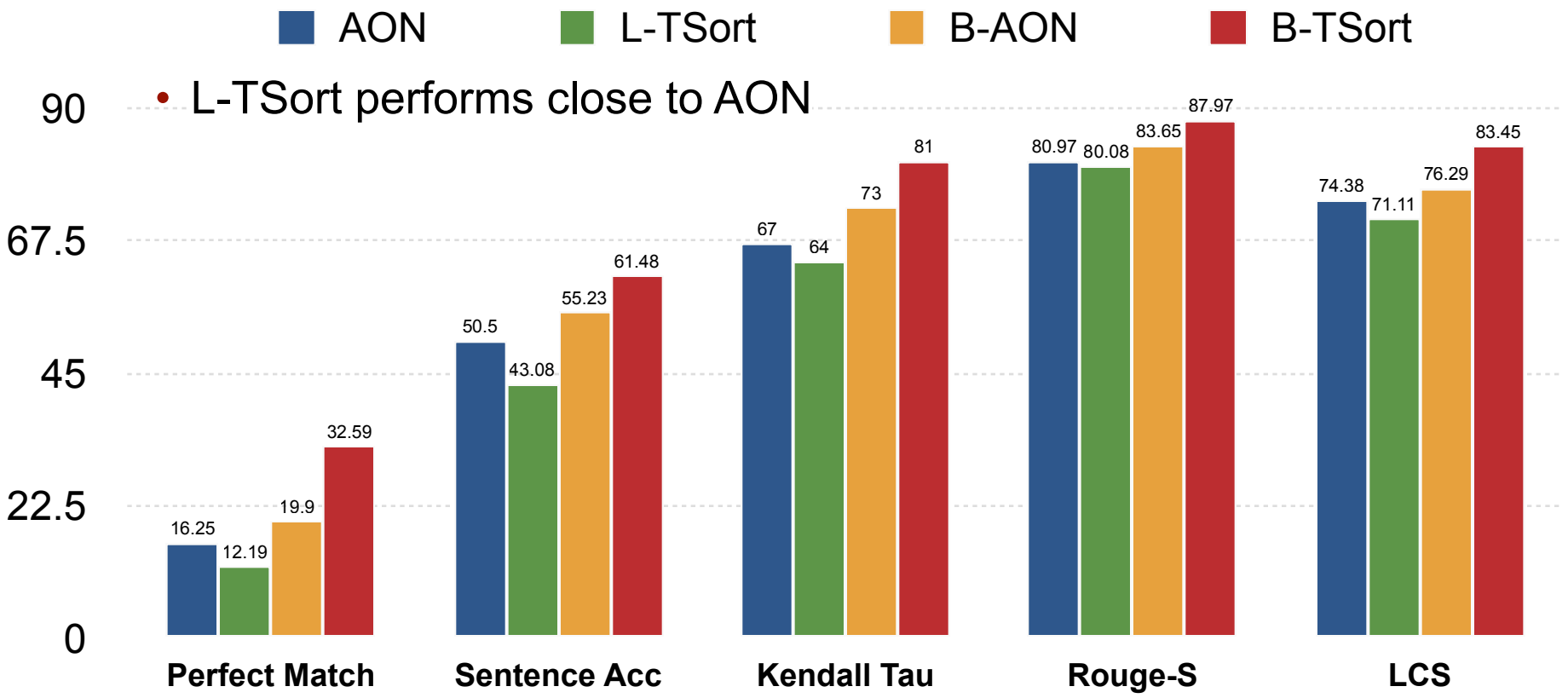
Results for NIPS abstracts



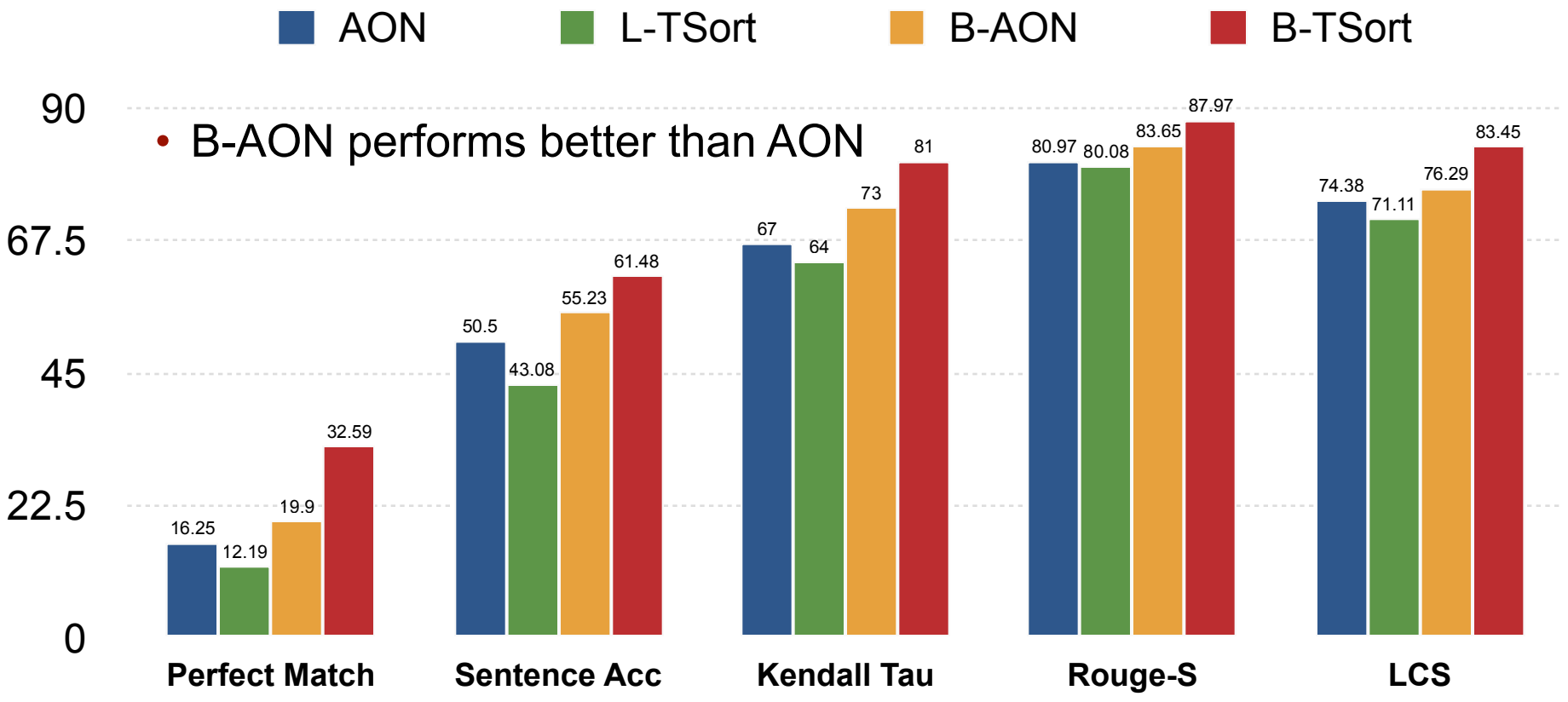
Results for NIPS abstracts



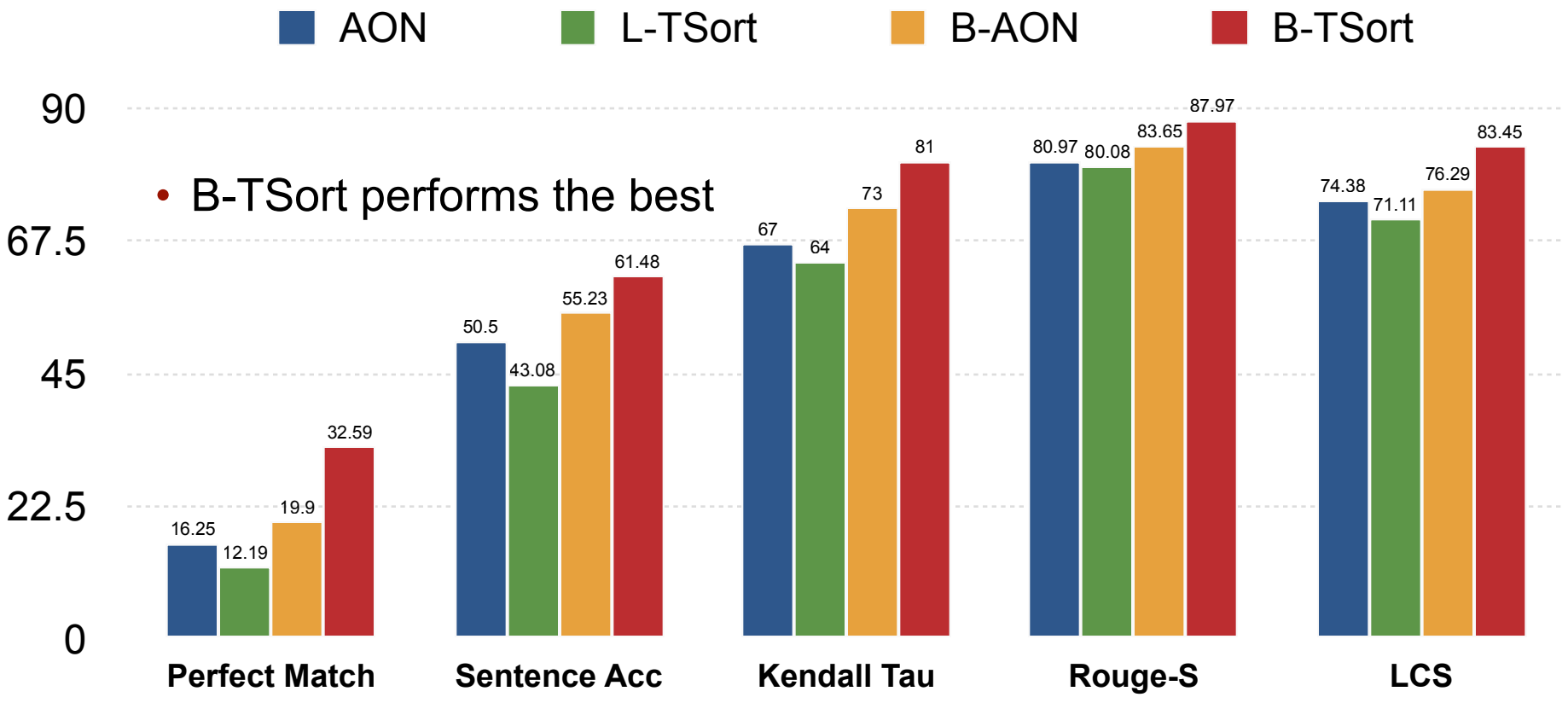
Results for NIPS abstracts



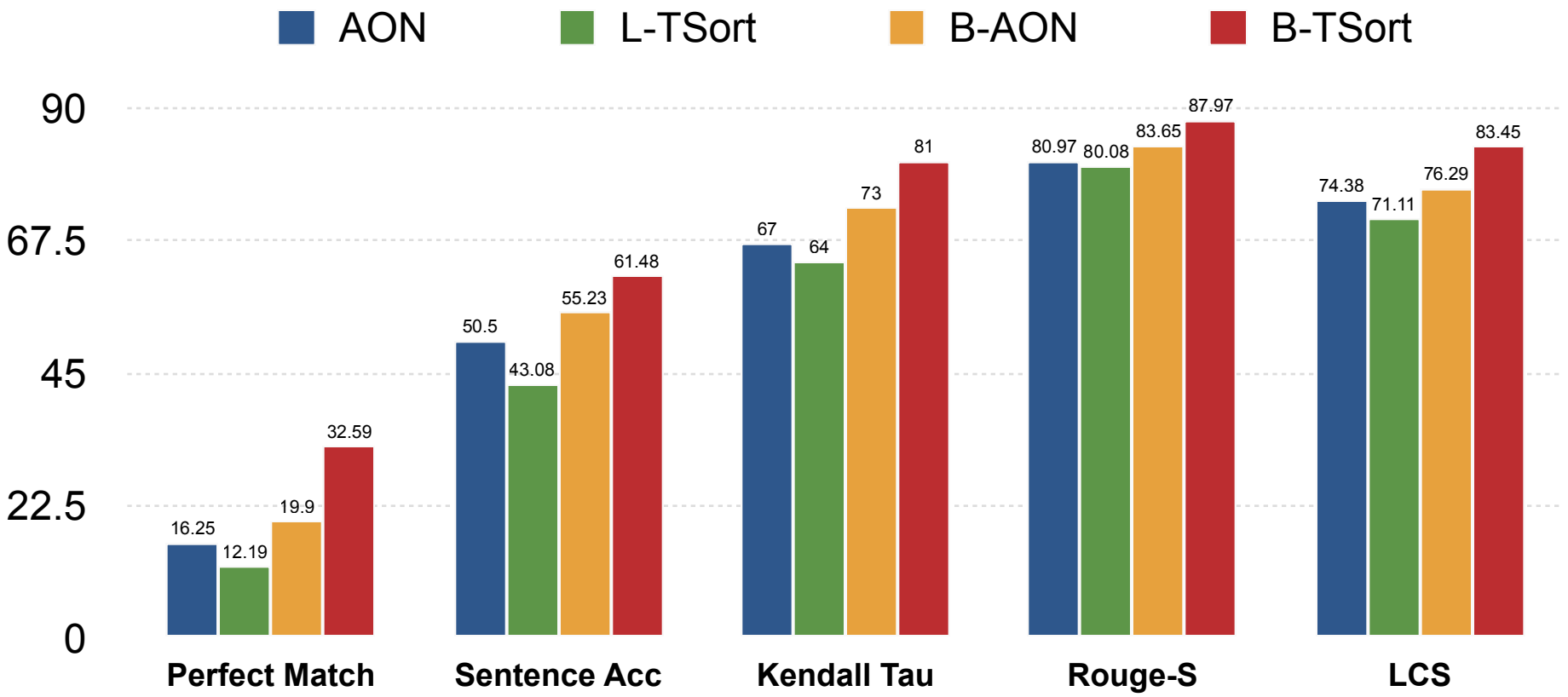
Results for NIPS abstracts



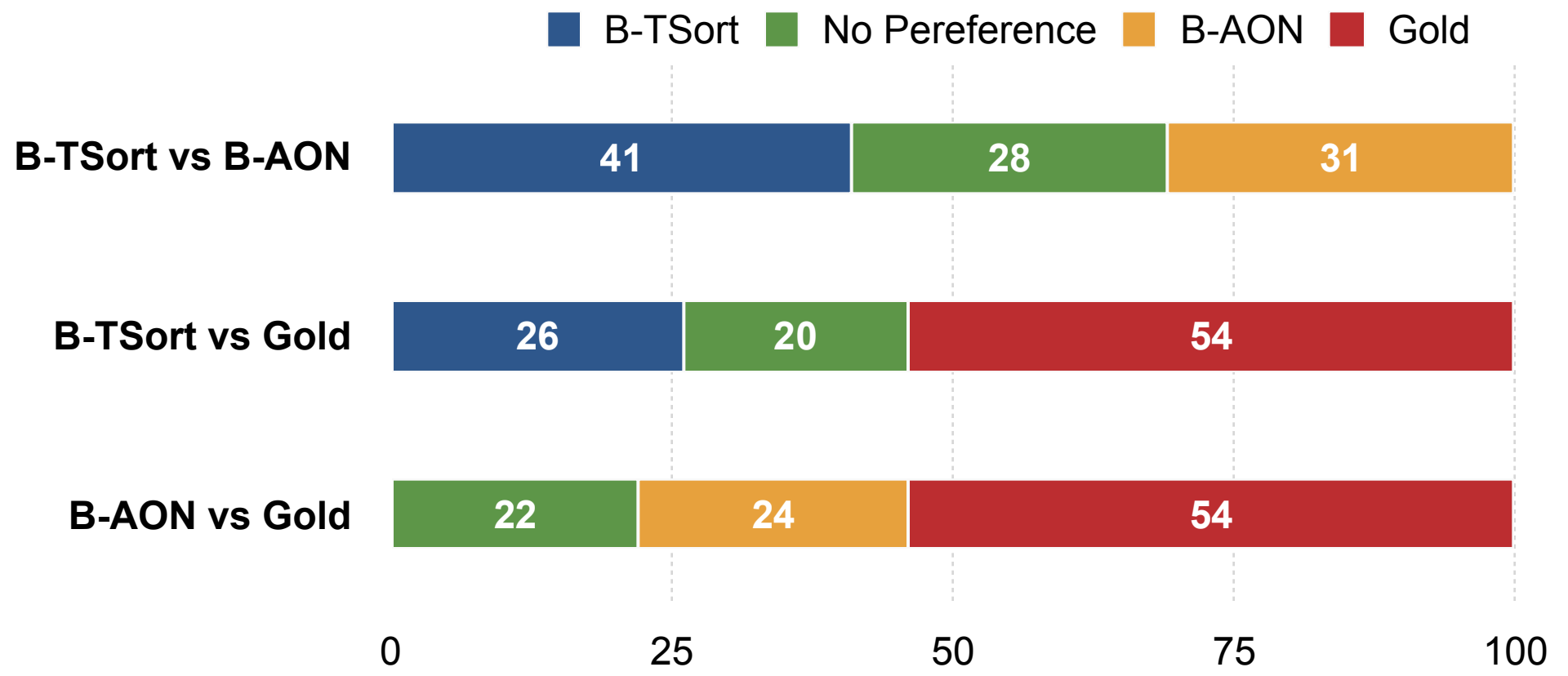
Results for NIPS abstracts



Results for NIPS abstracts



Results for Human Evaluation

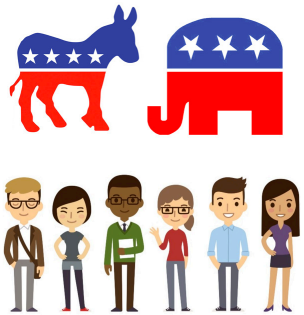


Results

- B-TSort performs best in all metrics for SIND captions, NSF abstract, AAN abstract datasets
- Analysis of *displaced sentences*
  - distance between the predicted position and the actual position of a sentence.
  - B-TSort displaces less sentences.
- Analysis of documents with more than 10 sentences
  - B-TSort also performs better for longer sentences
- Percentage of *mismatch* in input and output for AON
  - Order generation can have a mismatch between the input sentences and the generated orders.
  - This problem does not arise for our models.

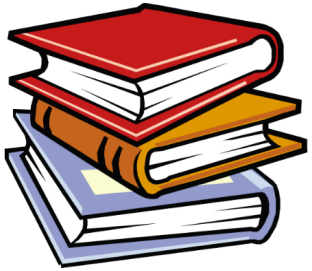
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

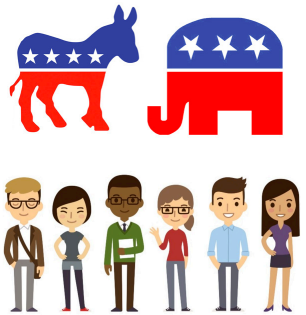
Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

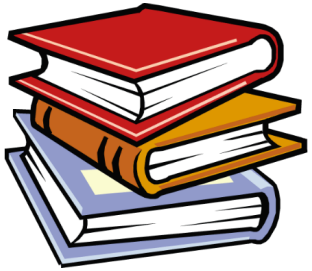
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

Ethical Considerations

- Swear words, obscenity, bias, hate speech
- Broader Impact of controllable text generation
- Social good and bad applications
  - Generate persuasive tweets to spread awareness about climate change
  - Generate persuasive social media content to keep people away from vaccines

Ethical Frameworks

- Grounding in the relevant literature outside AI.
- Respect for Autonomy

An agent should not adopt an action plan that the agent is rationally constrained to believe is inconsistent with an ethical action plan of another agent, without informed consent.

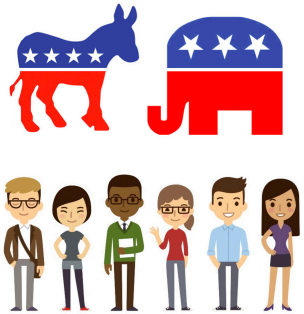
  - interacting and conveying complex information in natural language
- Interactional Fairness
  - respect, dignity, politeness, detecting objectionable content
- Generalization principle

[An agent] must be rational in believing that the reasons for action are consistent with the assumption that everyone with the same reasons will take the same action.

  - NLP can be used to extract evidence/rationales

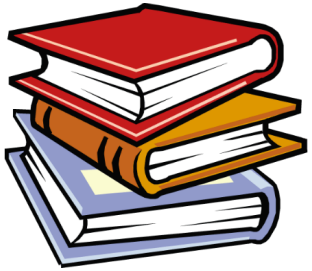
Overview

Style



ACL ’20
Storytelling ’19
ACL ’18

Content



NAACL ’19
EMNLP ’18

Structure

ACL ’20
draft EMNLP ’20

Ethical Considerations

WiNLP ’19

The key to human-like generation is Style, Content and Structure

The key to human-like generation is Style, Content and Structure

Style: **new model for style transfer and new styles like politeness, political slant, and gender.**

Content: **define new tasks to perform content grounded generation from unstructured data.**

Structure: **new framing of the sentence ordering task and the model is the new state-of-the art.**

Thank You!

- Alan W Black (co-advisor)
- Ruslan Salakhutdinov (co-advisor)
- Yulia Tsvetkov (committee member)
- Jason Weson (committee member)
- Michel Galley (collaborator)
- Chris Quirk (collaborator)

Thank You!

- Aman Madan
- Amrith Setlur
- Tanmay Parekh
- Kangyan Zhou