

Problematizing and Addressing the Article-as-Concept Assumption in Wikipedia

(based on our [CSCW17' paper](#))

Allen Yilun Lin¹, Bowen Yu², Andrew Hall², Brent Hecht¹

1. People, Space, and Algorithms (PSA) Computing Group, Northwestern University

2. GroupLens Research, University of Minnesota, Twin Cities

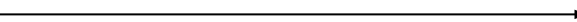
Article-as-Concept Assumption?

Article-as-Concept Assumption

Concepts

Wikipedia article

Justin Trudeau



Justin Trudeau

Angela Merkel



Angela Merkel

Theresa May



Theresa May

What's the problem?

Example 1:

Compare multilingual Wikipedias

Donald Trump



45th President of the United States

Incumbent

Donald Trump



45th President of the United States

Incumbent

English wiki v.s. Chinese wiki

Donald Trump



45th President of the United States

Incumbent

English wiki v.s. Chinese wiki

Family information

Family info on **English** Wikipedia:
of words: 559
% of the article: 3.86%

Family

Main article: Family of Donald Trump

Trump has five children by three marriages, and has eight grandchildren.^{[28][29]} His first two marriages ended in widely publicized



Family info on **English** Wikipedia:

of words: 559

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Family info on **Chinese** Wikipedia:

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His first two marriages ended in widely publicized



家庭

特朗普有一個兄弟和兩個姊妹。他的姊姊**玛丽安娜·特朗普·巴里**是聯邦高等法院的法官。他的父親具**德國**血統，而母親來自**蘇格蘭**，17歲移民至**美國紐約**從事**傭工**，1936年認識特朗普的父親，並於1942年取得**美國國籍**。

特朗普先後有三任妻子，育有三子兩女。妻子分別為：



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Family of Donald Trump

From Wikipedia, the free encyclopedia

This article is about the immediate family of Donald Trump. For the history of the Trump family as a whole, see Trump family.

The **family of Donald Trump**, the [President of the United States](#), is a prominent American family active in real estate, entertainment, business, and politics. Donald Trump's immediate family circle is the [First Family of the United States](#). They are part of the broader Trump family originating from Germany.

Contents [hide]

- 1 Immediate family
 - 1.1 Ivana Trump
 - 1.2 Marla Maples
 - 1.3 Melania Trump
 - 1.4 Children
 - 1.4.1 Don Jr., Ivanka, and Eric Trump
 - 1.4.2 Tiffany Trump
 - 1.4.3 Barron Trump
 - 1.5 Grandchildren
- 2 Ancestry
 - 2.1 Parents
 - 2.1.1 Fred Trump
 - 2.1.2 Mary Anne MacLeod Trump
 - 2.2 Grandparents
 - 2.2.1 Frederick Trump
 - 2.2.2 Elizabeth Christ Trump
 - 2.3 Notable relatives
 - 2.3.1 John G. Trump
 - 2.3.2 Maryanne Trump Barry
 - 2.4 Genealogical table
- 3 Coats of arms
 - 3.1 Trump University logo
 - 3.2 Trump International Golf Links logo
- 4 References

The Donald J. Trump family



The U.S. First Family (Clockwise from top left: Donald, Melania, Don Jr., Barron, Tiffany, Eric and Ivanka Trump).

Current region	Manhattan, New York
Members	Donald Trump & Melania Trump Donald Trump Jr. Ivanka Trump Eric Trump Tiffany Trump Barron Trump
Connected members	Frederick Trump & Elizabeth Christ Trump Paternal Grandparents Fred Trump & Mary Anne MacLeod Trump Parents John George Trump Paternal Uncle Hon. Maryanne Trump Barry Sister
Connected	Eric Trump

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% of the article: **13.91%**

Family info on **Chinese** Wikipedia:

of characters: **578**

% of the article: **4.42%**

Example 2:

Artificial Intelligence using Wikipedia



Milne-Witten Semantic Relatedness

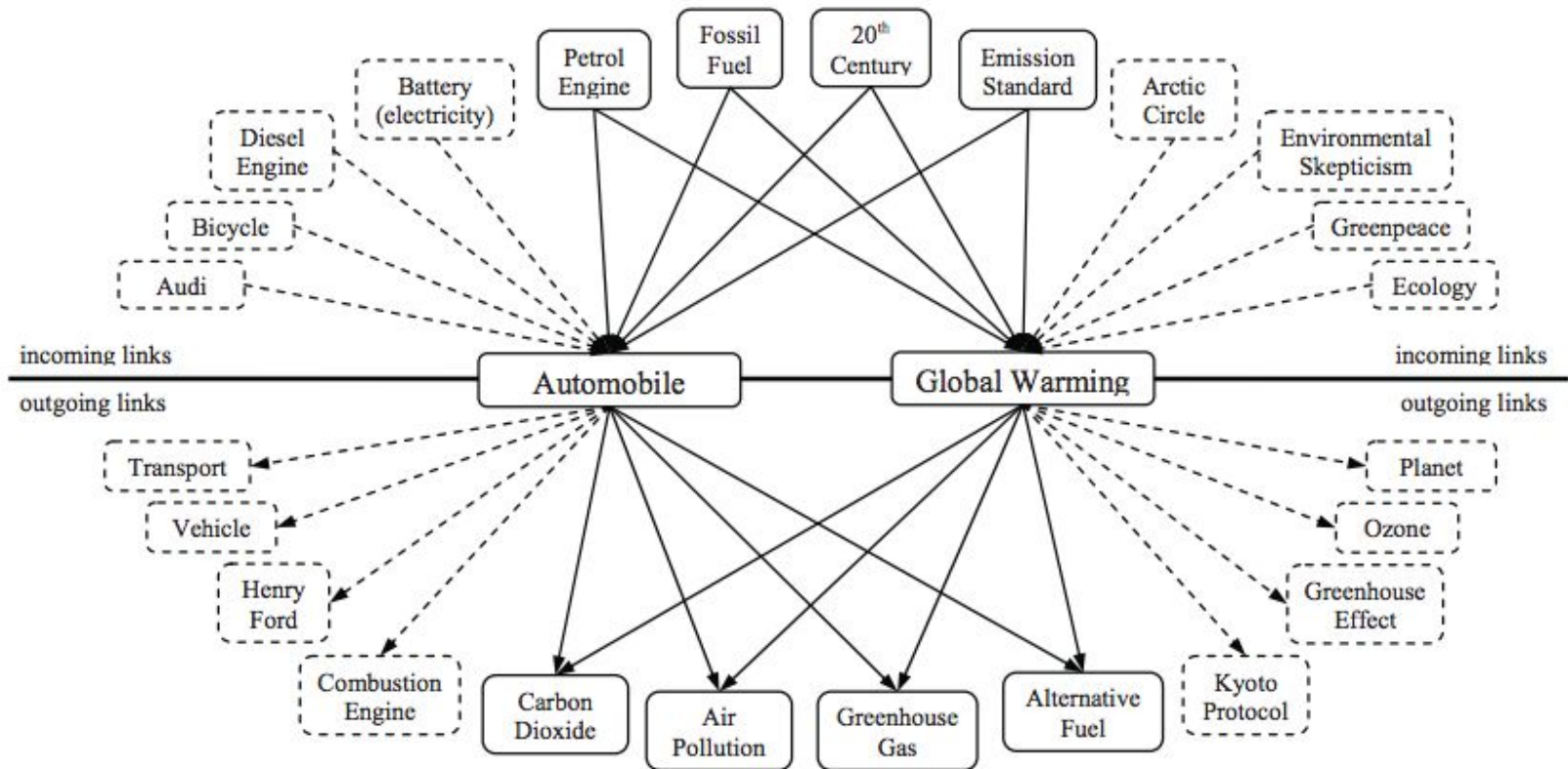
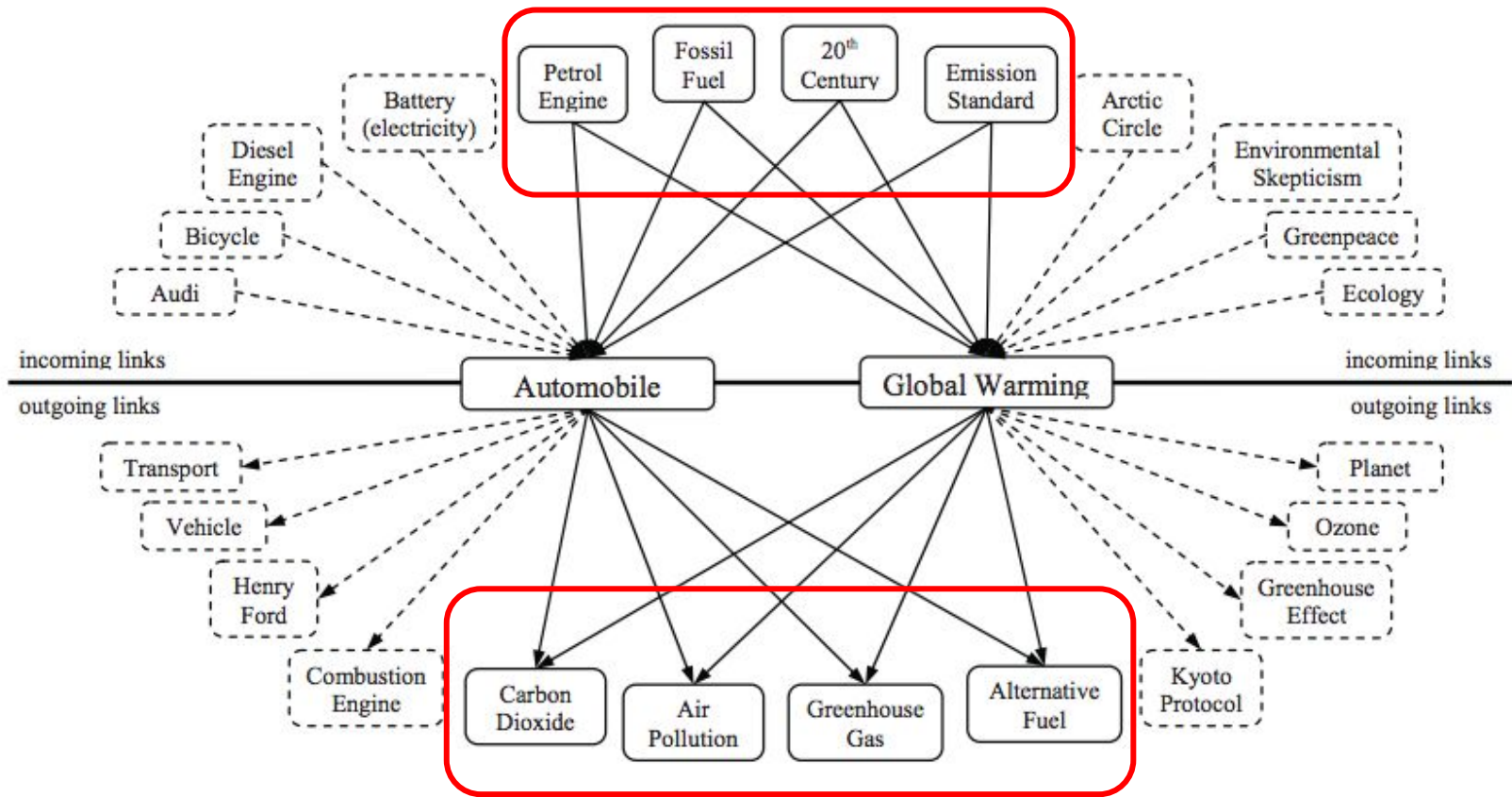


Figure from Witten, Ian, and David Milne. "An effective, low-cost measure of semantic relatedness obtained from Wikipedia links." AAAI Workshop 2008¹⁸

Milne-Witten Semantic Relatedness



Milne-Witten Semantic Relatedness

inlinks
outlinks

Donald Trump

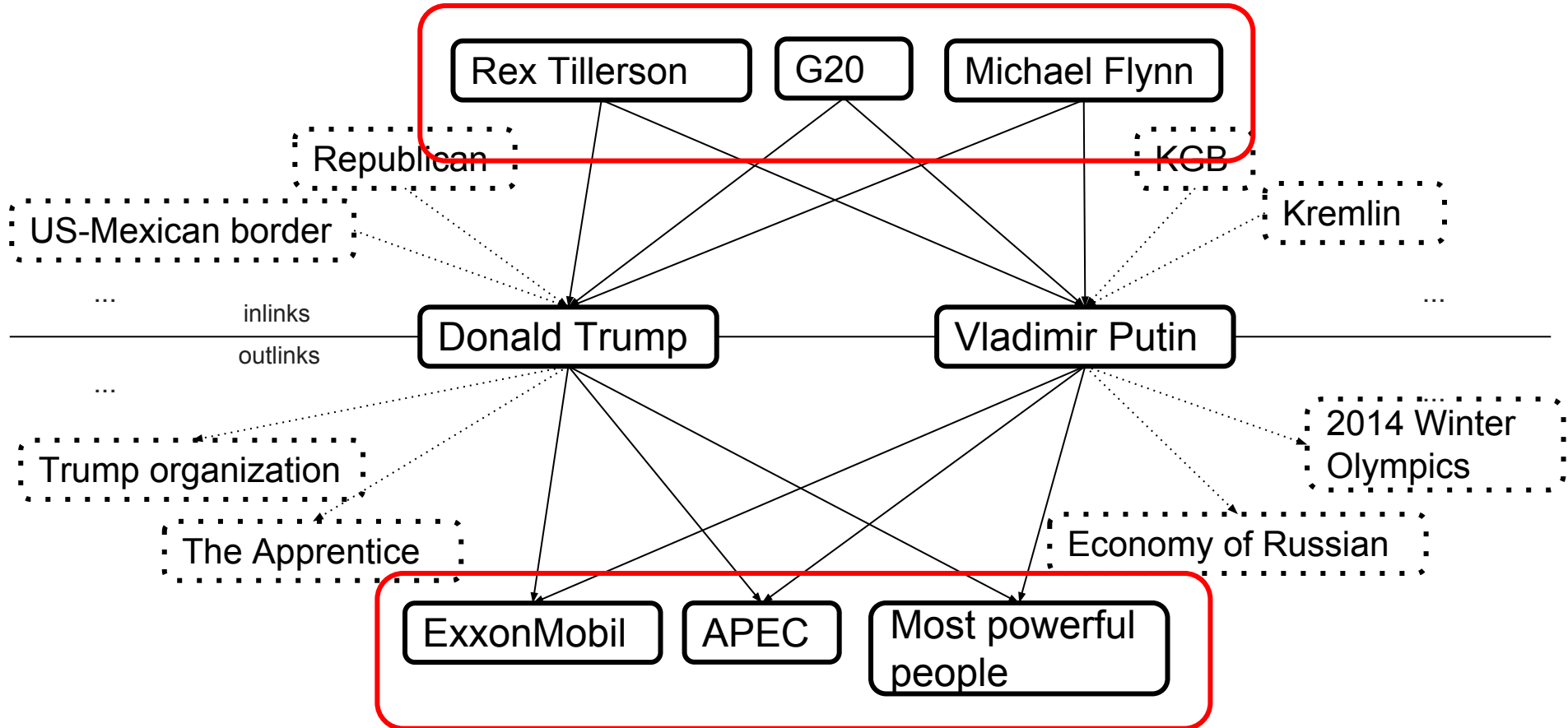
Milne-Witten Semantic Relatedness

inlinks
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Donald Trump

Vladimir Putin

Milne-Witten Semantic Relatedness



Foreign policy

Main article: Foreign policy of Donald Trump

Trump has been described as **non-interventionist**^{[609][610]} and nationalist.^[611] Trump repeatedly stated that he supports "**America First**" foreign policy.^[612] He supports increasing United States military defense spending,^[611] but favors decreasing United States spending on **NATO** and in the Pacific region.^[613] He says America should look inward, stop "nation building", and re-orient its resources toward



Japanese Prime Minister **Shinzō Abe** and Trump meeting in Trump Tower, **Manhattan**, on November 17, 2016

Foreign policy of the Donald Trump administration

From Wikipedia, the free encyclopedia



It has been [requested](#) that the [title](#) of this article be [changed](#) to *Foreign policy of the Trump administration*. Please see the relevant discussion on the [discussion page](#). Do **not** move the page until the discussion has reached consensus for the change and is closed.

The **foreign policy of Donald Trump** is Donald Trump's policy regarding dealings with other nations.

Contents [hide]

- Overview
 - United States Armed Forces and defense spending
 - Diplomacy and U.S. allies
 - Action against terrorists' families
 - Conducting national security activities in public settings
- Americas
 - Cuba
 - Mexico
- Asia
 - Afghanistan
 - China and Taiwan



This article is part of
a series about
Donald Trump

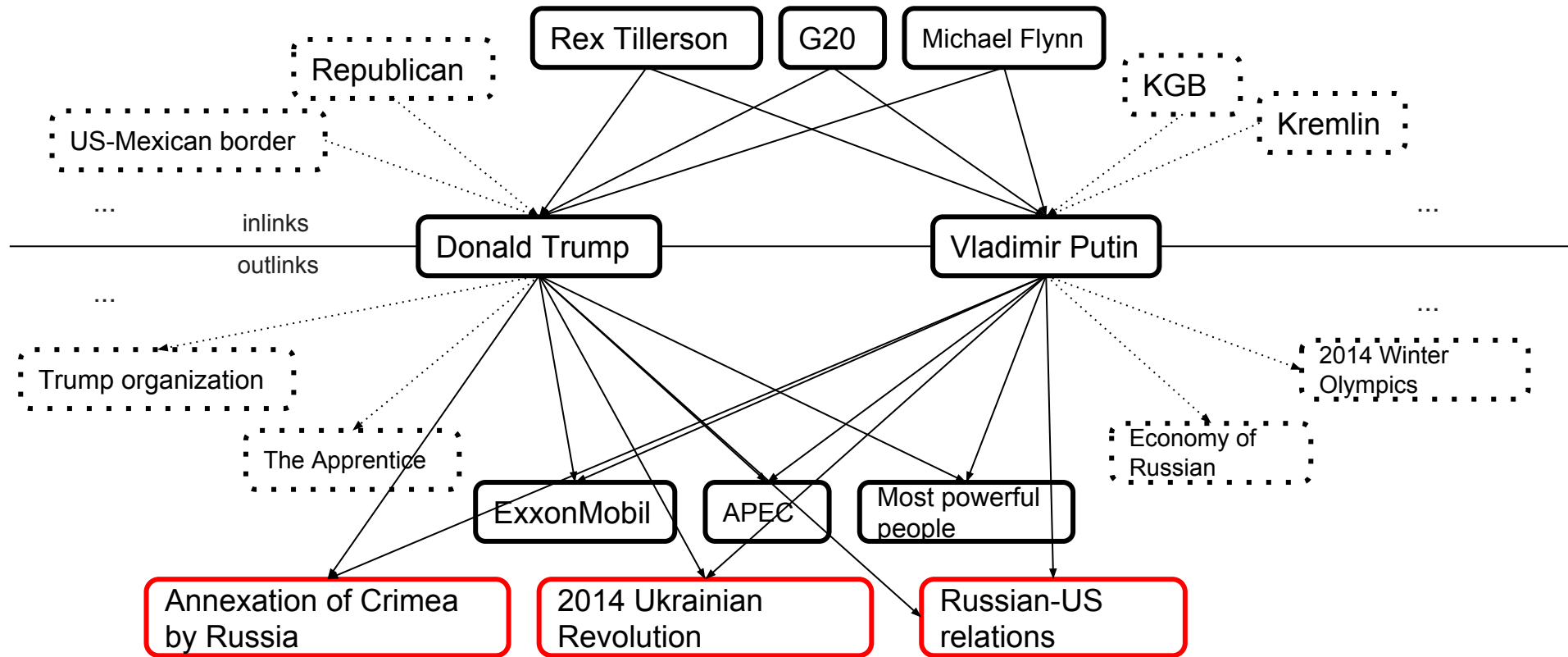
President of the United States
Incumbent

[Election](#) · [International reactions](#) · [Transition](#)
· [Inauguration](#) · [Presidency \(Timeline](#) ·
[First 100 days](#) · [Executive actions](#) · [Trips](#) ·
[Appointments \(Cabinet](#) · [Supreme Court\)](#) ·
[Opinion polling](#)

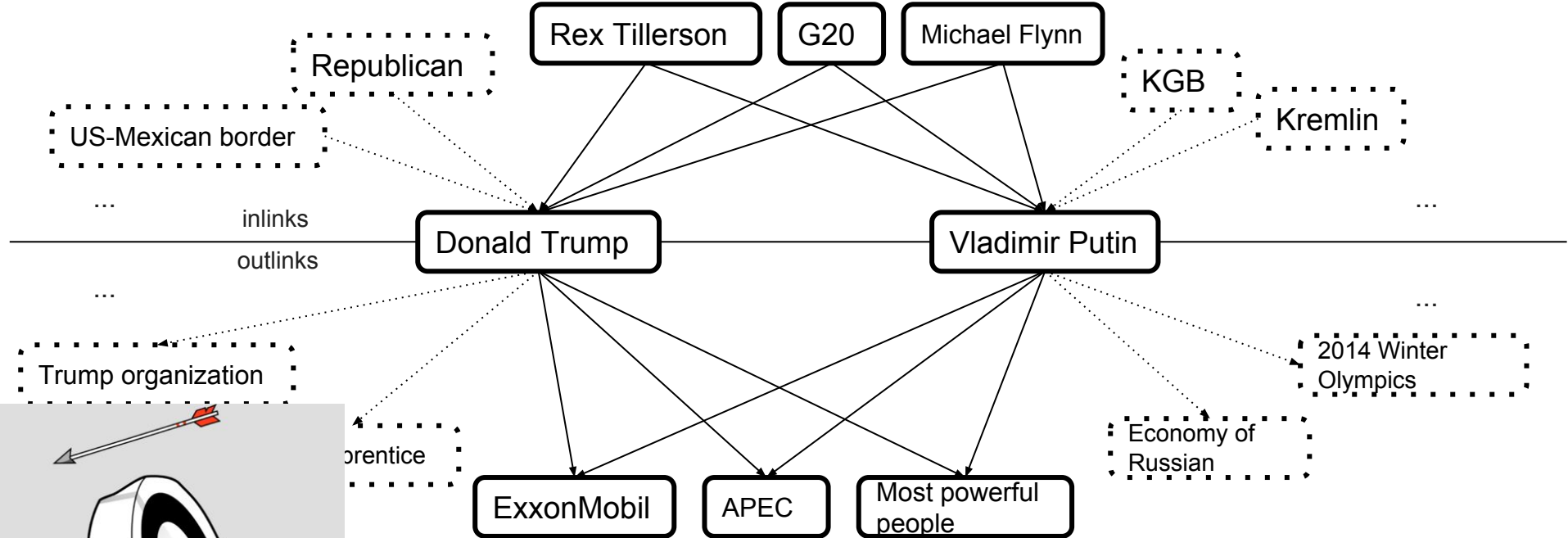
Political positions

[Economy](#) · [Foreign policy](#) · [Immigration](#) ·
[Social issues](#)

Milne-Witten Semantic Relatedness



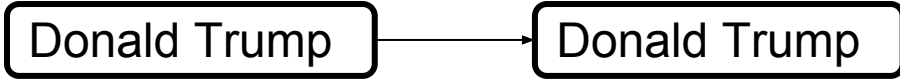
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Problematizing and Addressing the **Article-as-Concept** Assumption in Wikipedia

Concepts

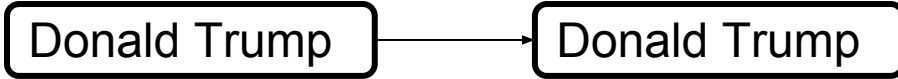
Wikipedia article



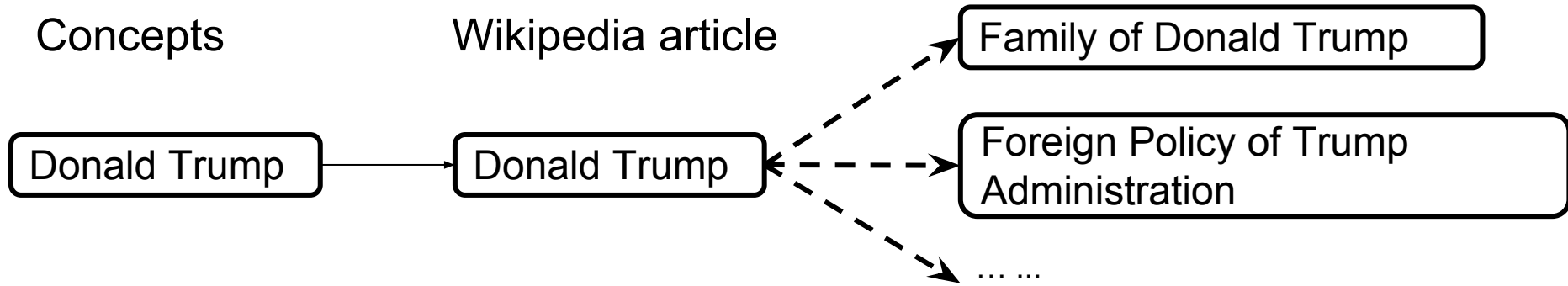
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Concepts

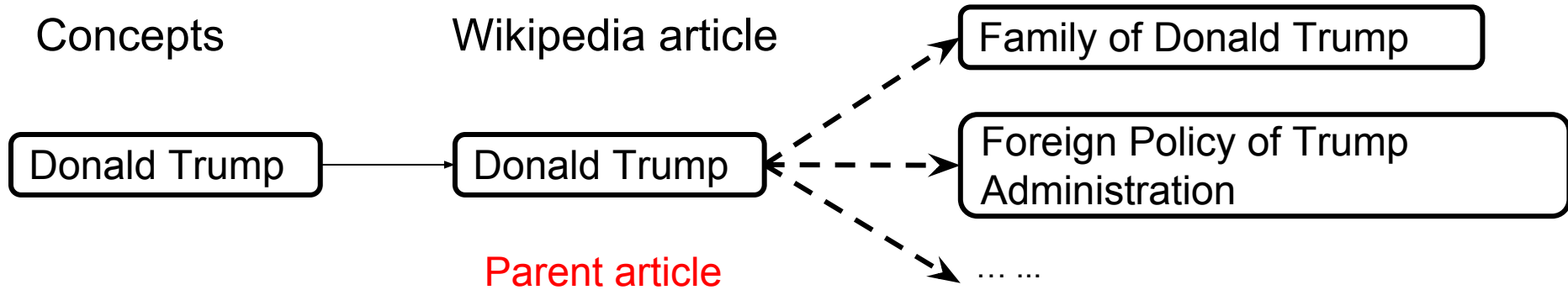
Wikipedia article



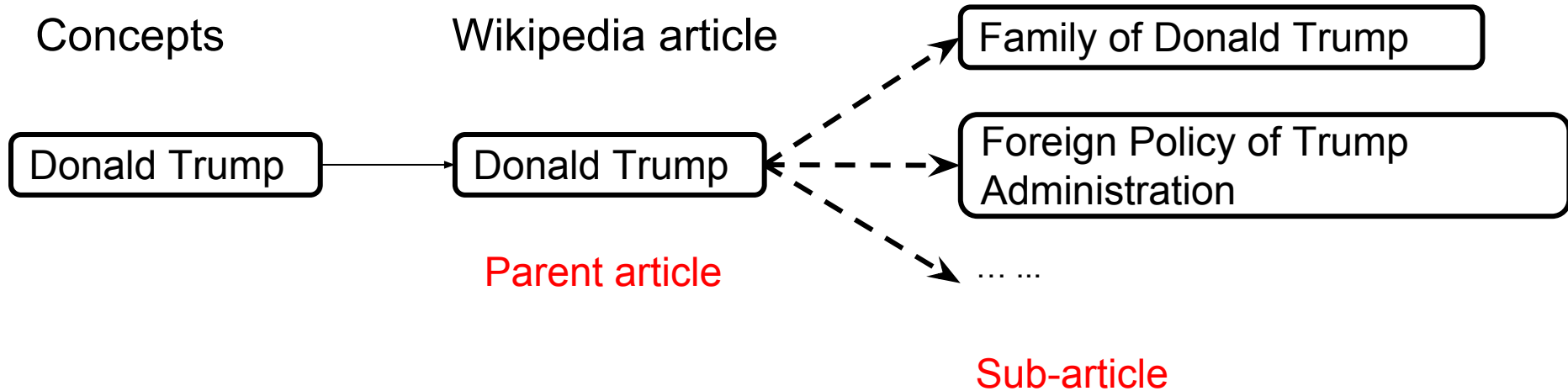
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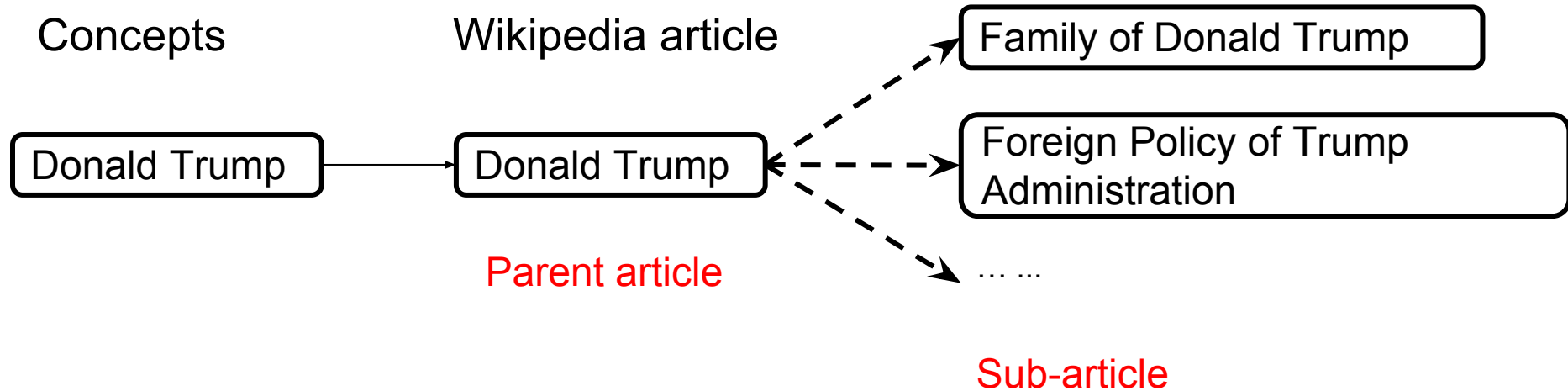
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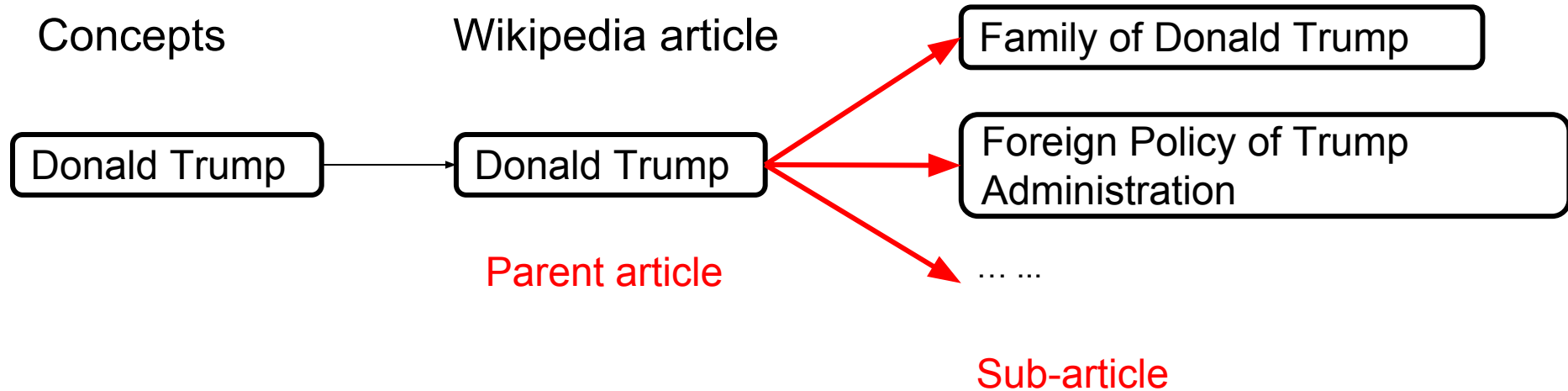
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Problematizing and Addressing the **Article-as-Concept** Assumption in Wikipedia



Problematizing and Addressing the **Article-as-Concept** Assumption in Wikipedia




Outline

1. Motivation and problem
2. Step 1: Filter sub-article candidates
3. Step 2: Develop training datasets
4. Step 3: Classify sub-article relationship
5. Discussion: audience-author mismatch
6. Summary

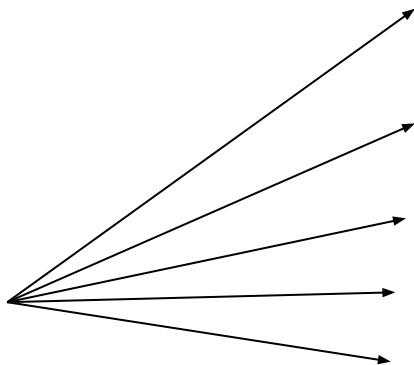
Step 1: Filter sub-article candidates

Donald Trump



45th President of the United States

Incumbent



...

...



WIKIPEDIA
The Free Encyclopedia

> 5 million articles

Reduce the # of comparisons?

Step 1: Filter sub-article candidates

Donald Trump



45th President of the United States

Incumbent

Personal life

Early life

Further information: Trump family

Trump was born on June 14, 1946, at the Jamaica Hospital Medical Center in the Jamaica neighborhood of Queens, New York City. He was the fourth of five children born to Frederick Christ "Fred" Trump (1905–1999) and Mary Anne Trump (née MacLeod, 1912–2000).^{[2][3]} His siblings are Maryanne, Fred Jr., Elizabeth, and Robert. Trump's older brother Fred Jr. died in 1981 from alcoholism, which Trump says led him to abstain from alcohol and cigarettes.^[4]

Family

Main article: Family of Donald Trump

Trump has five children by three marriages, and has eight grandchildren.^{[32][33]} His first two marriages ended in widely publicized divorces.^[34]

Trump married his first wife, Czech model Ivana Zelníčková, on April 7, 1977, at the Marble Collegiate Church in Manhattan^[35] in a ceremony performed by one of America's most famous ministers, the Reverend Norman Vincent Peale.^[36]

They had three children: son Donald Jr. (born December 31, 1977), daughter Ivanka (born October



At a 2016 campaign event, from left: son-in-law Jared, daughter Ivanka, Trump, wife Melania, daughter-in-law Lara, and son Eric ⁵

Step 1: Filter sub-article candidates

`{{Further|Trump Family}}`

Early life

Further information: Trump family

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At a 2016 campaign

Images from: https://en.wikipedia.org/wiki/Donald_Trump

Step 1: Filter sub-article candidates

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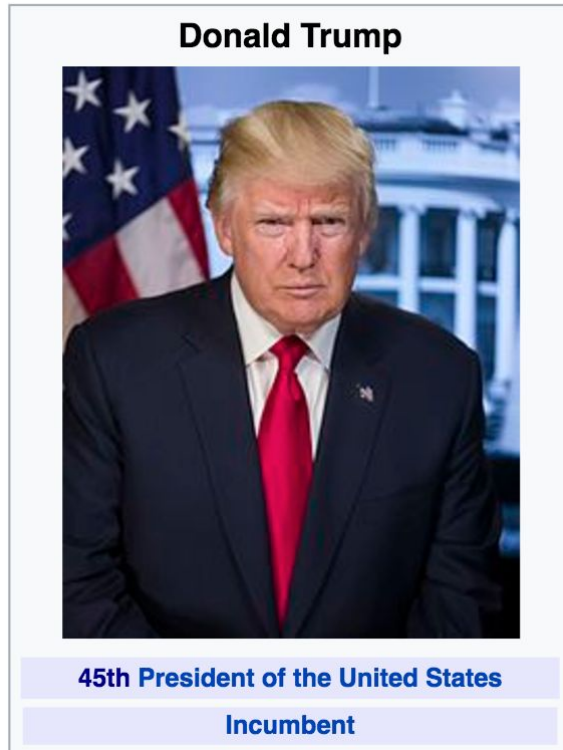
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Images from: https://en.wikipedia.org/wiki/Donald_Trump

See also

- [List of Presidents of the United States](#)
- [List of richest American politicians](#)
- [Public image of Donald Trump](#)

Step 1: Filter sub-article candidates

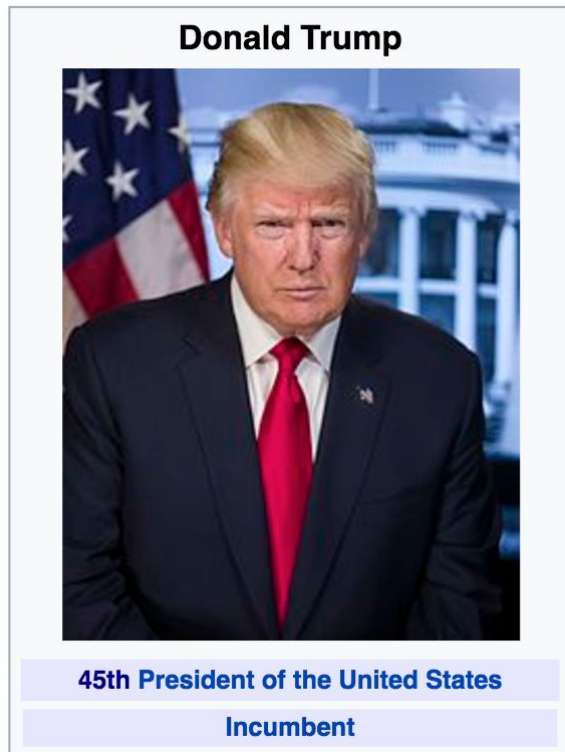


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Step 1: Filter sub-article candidates



The Apprentice

Main articles: The Apprentice (U.S. TV series) and The Apprentice (TV series)



Family

Main article: Family of Donald Trump



Palm Beach estate

Main article: Mar-a-Lago



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Step 2: Develop training datasets

High-Interest

Donald Trump

Melania Trump

La La Land

Super Bowl
Champions

Step 2: Develop training datasets

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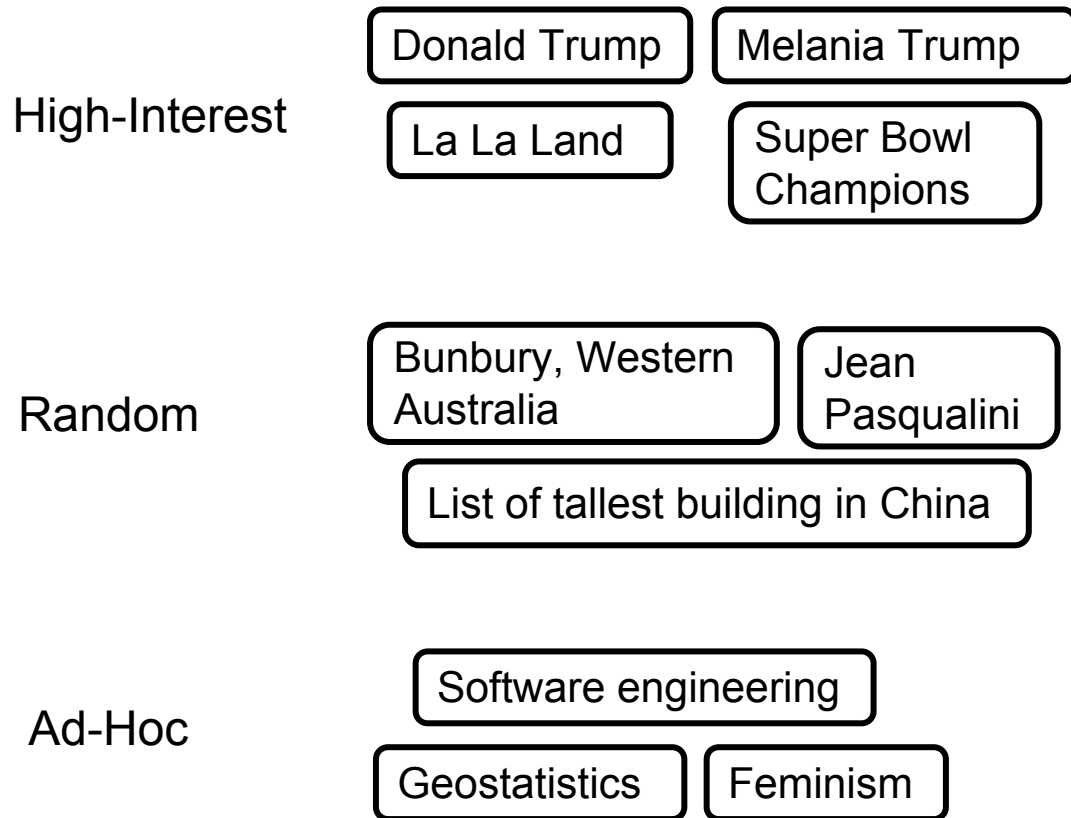
Random

Bunbury, Western
Australia

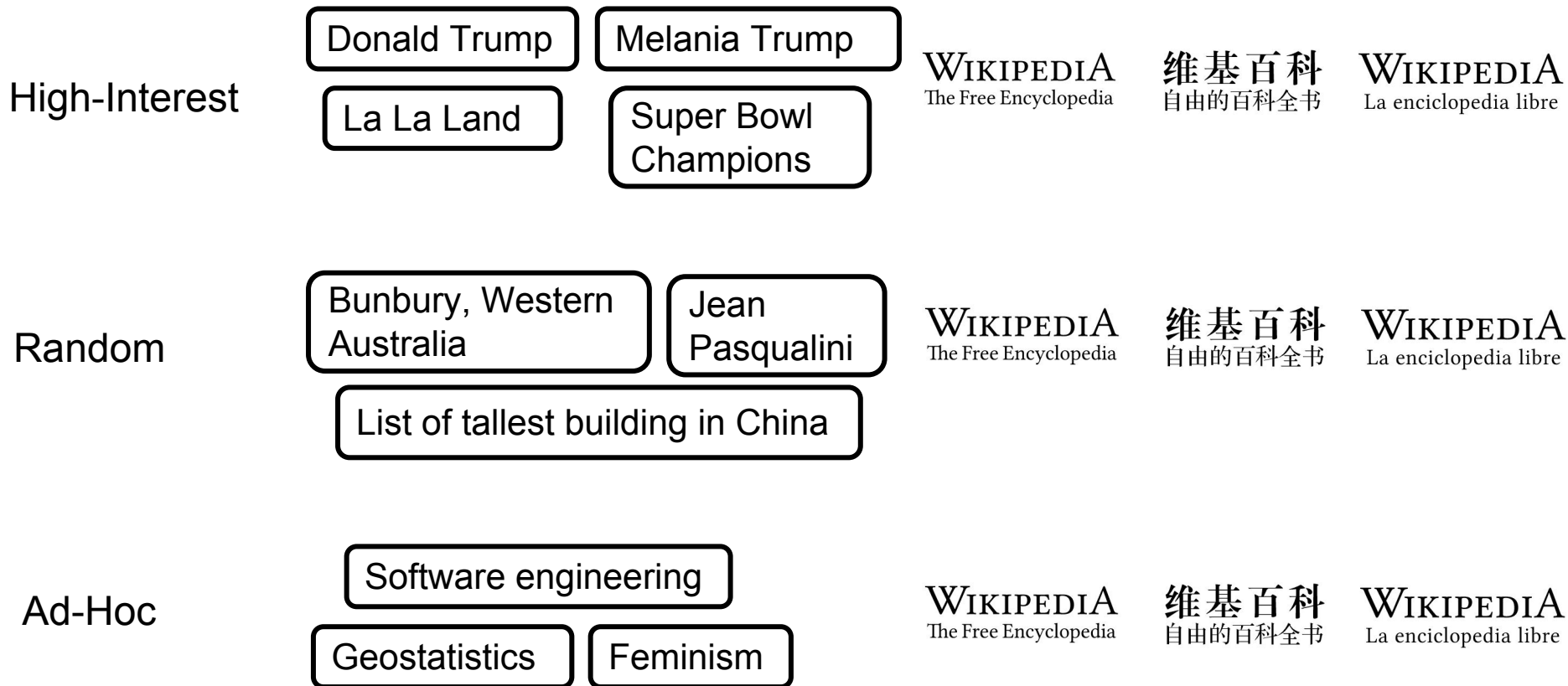
Jean
Pasqualini

List of tallest building in China

Step 2: Develop training datasets



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Step 3: Classify sub-article relationship

Relative importance/centrality

E.g. IndegreeRatio =

Incoming link of parent article
Incoming link of sub-article

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Relative importance/centrality

E.g. IndegreeRatio =

$$\frac{\text{Incoming link of parent article}}{\text{Incoming link of sub-article}}$$

Implicit Linguistic

E.g. MaxMainTFinSub =

$$\max\{\text{TF of parent article in sub-article's summary}\}$$

Step 3: Classify sub-article relationship

Parent article

Donald Trump

From Wikipedia, the free encyclopedia

This article is about the incumbent President of the United States. For other uses, see [Donald Trump \(disambiguation\)](#).

Donald John Trump (born June 14, 1946) is an American businessman, television personality, politician, and the 45th President of the United States. Born and raised in Jamaica, Queens, New York City, Trump received an economics degree from the Wharton School of the University of Pennsylvania in 1968. In 1971, he took charge of his family's real



Sub-article candidate

Foreign policy of the Donald Trump administration

From Wikipedia, the free encyclopedia
(Redirected from Foreign policy of Donald Trump)

The **foreign policy of Donald Trump** is Donald Trump's policy regarding dealings with other nations.

Contents [hide]

1 Overview



This article is part of
a series about
Donald Trump

{*Donald Trump, Foreign policy of Donald Trump*}

Images from: https://en.wikipedia.org/wiki/Donald_Trump | https://en.wikipedia.org/wiki/Foreign_policy_of_the_Donald_Trump_administration

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{Donald Trump, Foreign policy of Donald Trump} = 2

Images from: https://en.wikipedia.org/wiki/Donald_Trump | https://en.wikipedia.org/wiki/Foreign_policy_of_the_Donald_Trump_administration

Step 3: Classify sub-article relationship

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Implicit Linguistic

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$$\max\{\text{TF of parent article in sub-article's summary}\}$$

Explicit Template

E.g. MainTemplateRatio =

$$\frac{\# \text{ langs using main template}}{\# \text{ langs two articles coexists}}$$

Step 3: Classify sub-article relationship

Foreign policy

Main article: Foreign policy of Donald Trump

Trump has been described as non-interventionist^{[630][631]} and nationalist.^[632] Trump has repeatedly stated that he supports "America First" foreign policy.^[633] He supports increasing United States military defense spending,^[632] but favors decreasing United States spending on NATO and in the Pacific region.^[634] He says America should look toward other nations hostilely and resist the



Main template used in English and French Wikipedia

{Donald Trump, Foreign policy of Donald Trump}

Images from: https://en.wikipedia.org/wiki/Donald_Trump

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Main template used in English and French Wikipedia

Two articles coexist in 5 languages

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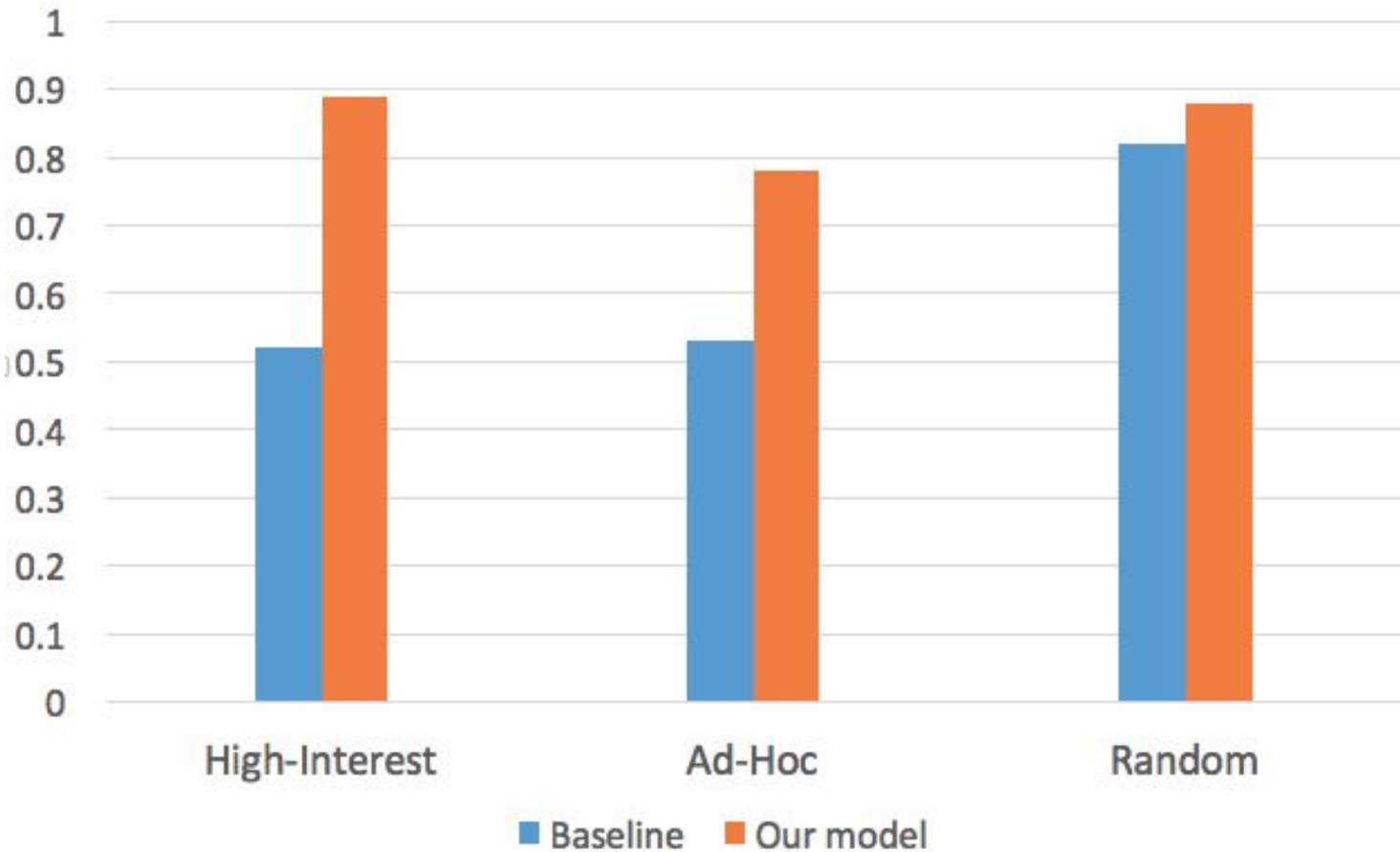
Two articles coexist in 5 languages

{*Donald Trump*, *Foreign policy of Donald Trump*} = 2/5

Images from: https://en.wikipedia.org/wiki/Donald_Trump

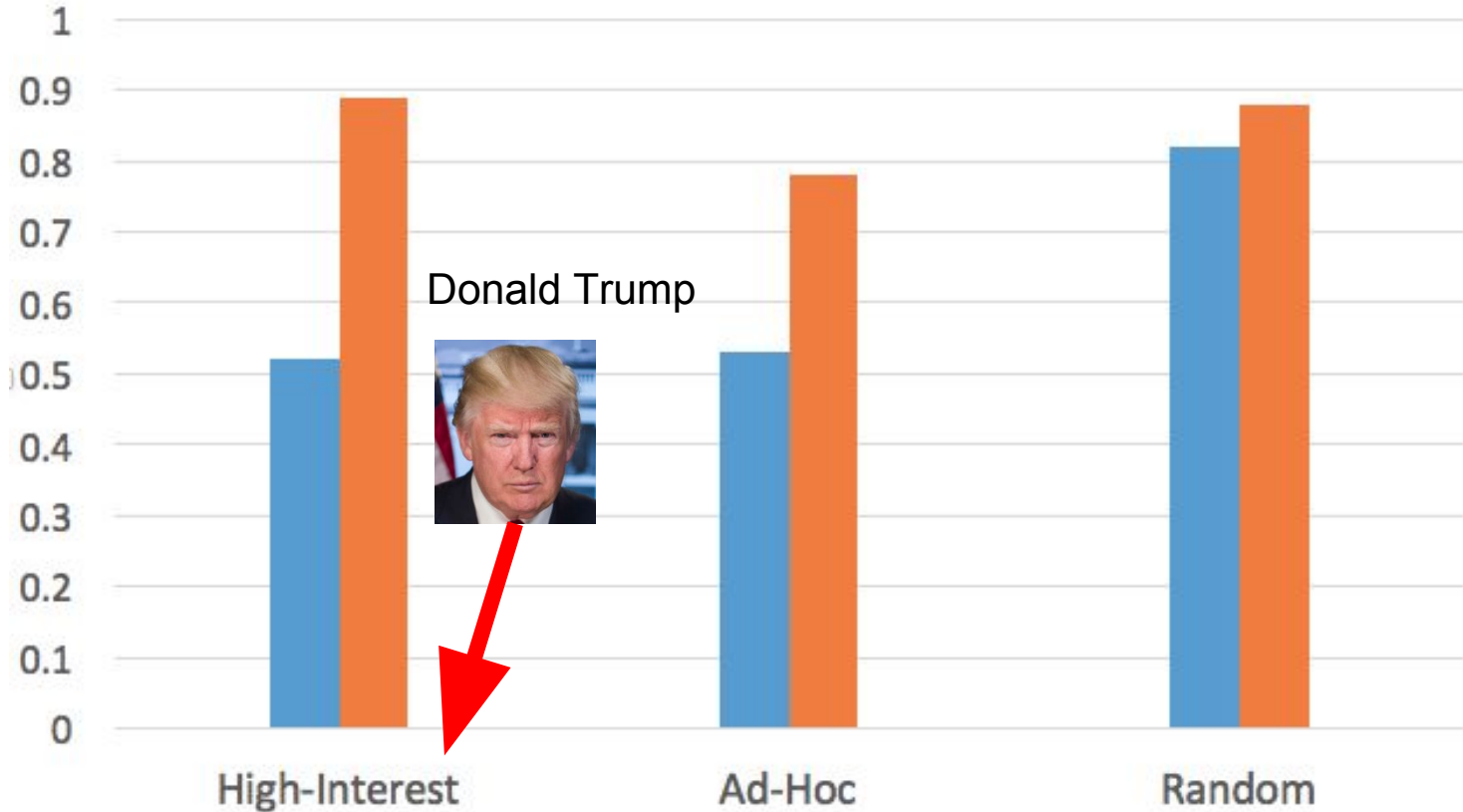
Classification accuracies across datasets, averaged across languages

Accuracies



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Accuracies



Donald Trump

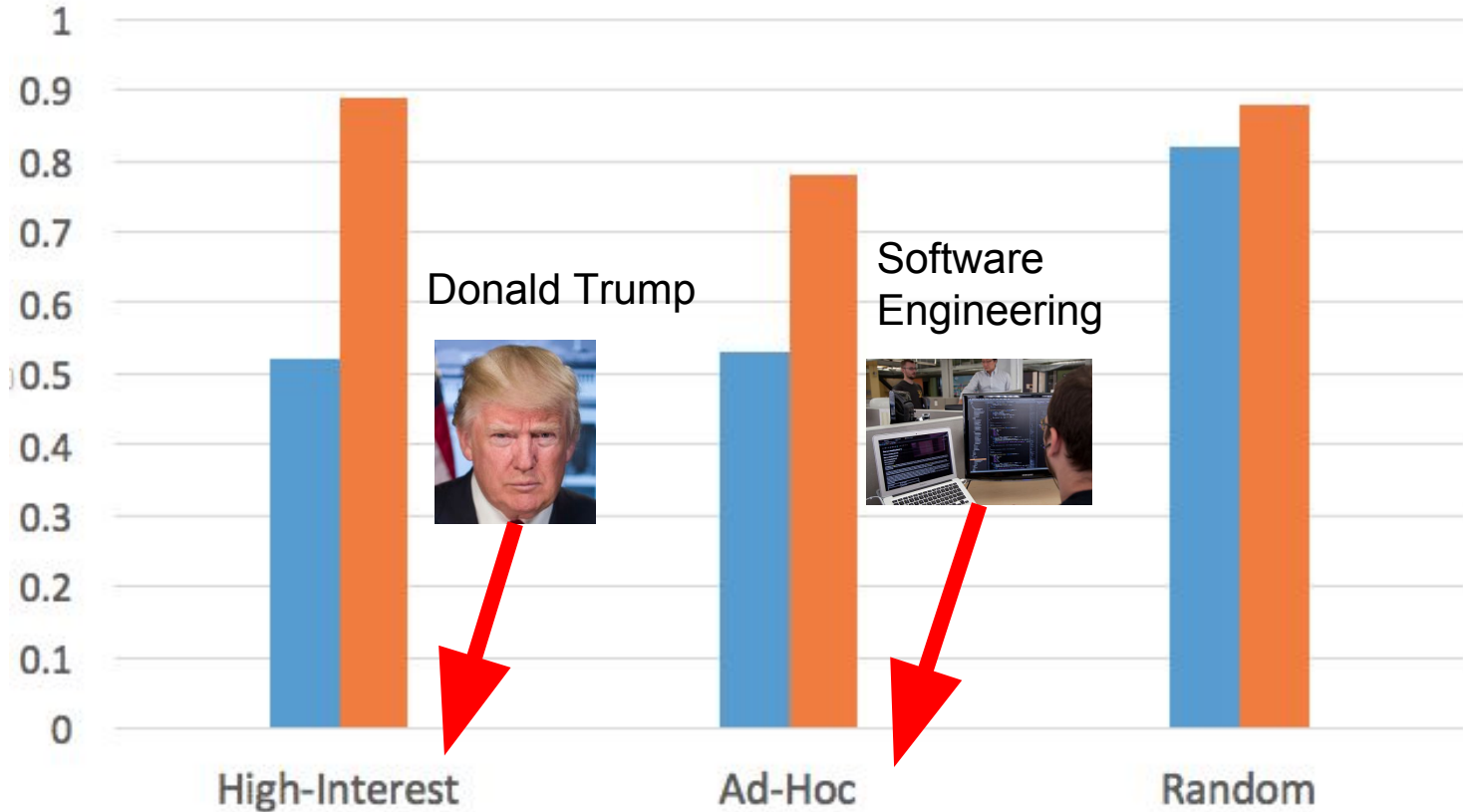


Images from: https://en.wikipedia.org/wiki/Donald_Trump

■ Baseline ■ Our model

Classification accuracies across datasets, averaged across languages

Accuracies



Donald Trump



Software Engineering

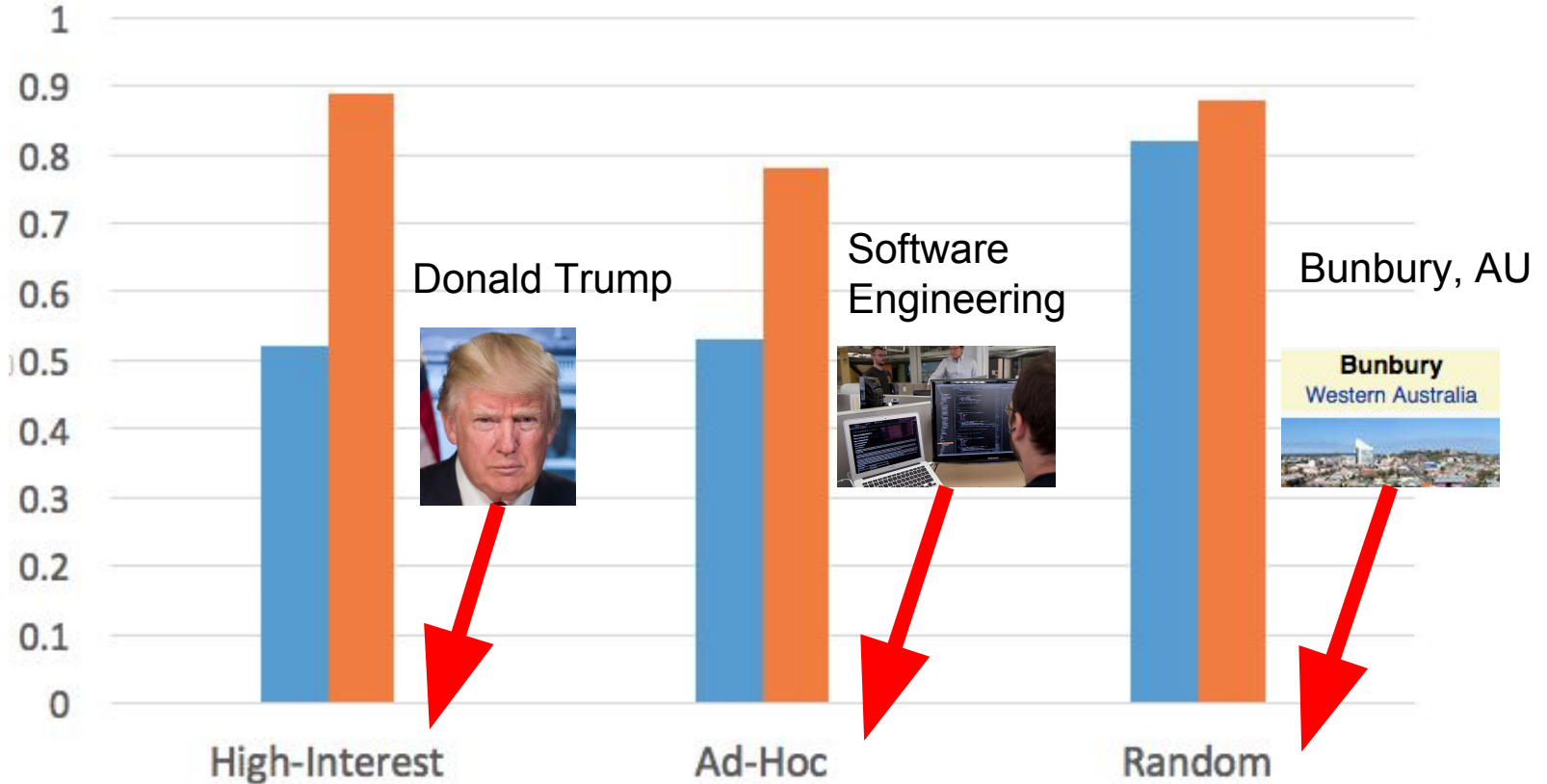


Images from: https://en.wikipedia.org/wiki/Donald_Trump
Images from: https://en.wikipedia.org/wiki/Software_engineering

■ Baseline ■ Our model

Classification accuracies across datasets, averaged across languages

Accuracies



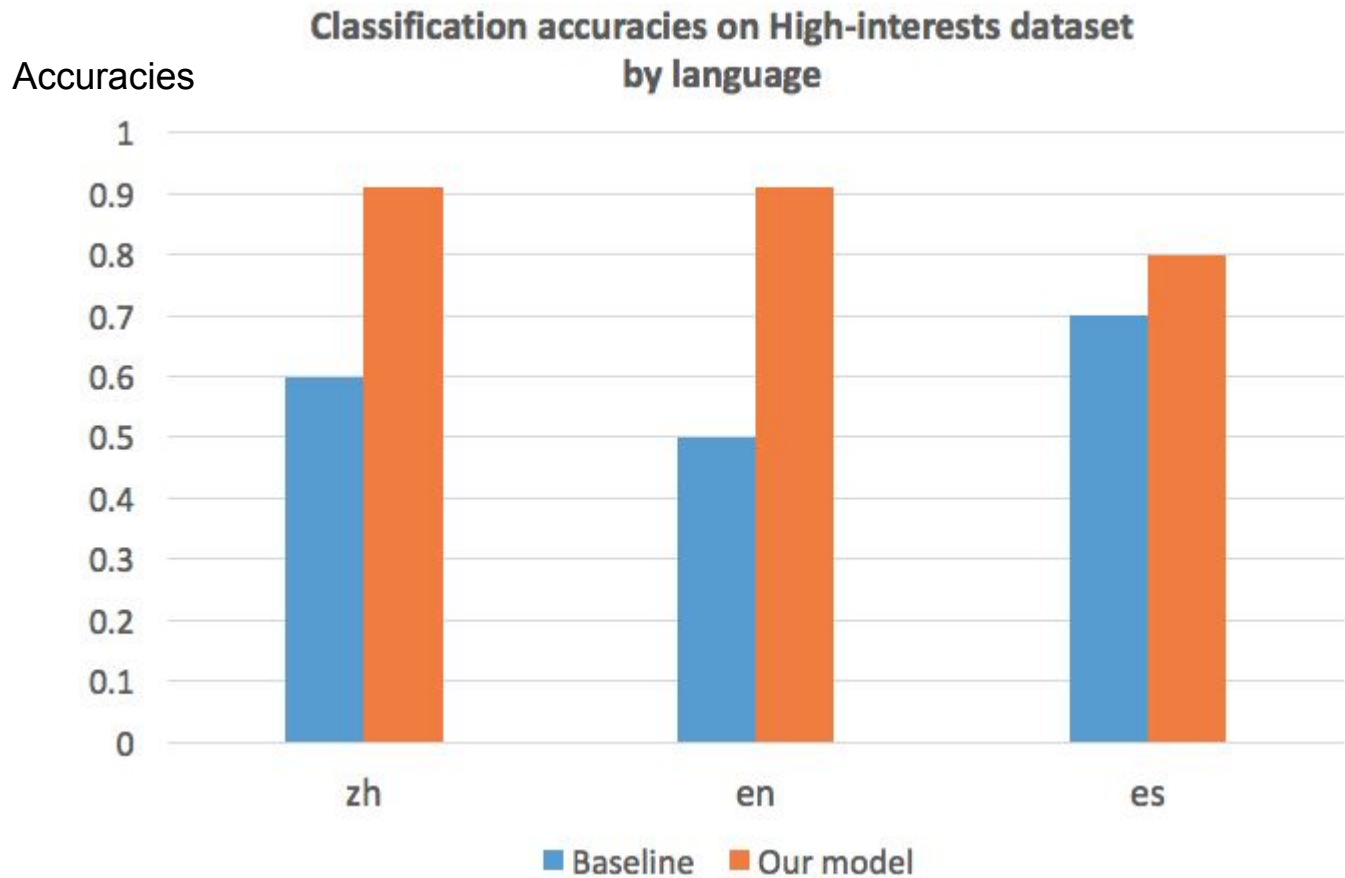
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Images from: https://en.wikipedia.org/wiki/Software_engineering

Images from: https://en.wikipedia.org/wiki/Bunbury,_Western_Australia

■ Baseline ■ Our model

Performance: High-Interest dataset



**Real impact of
article-as-concept assumption?**

Real impact of article-as-concept problem

Impact Metric	Statistics
% of articles w/ sub-articles	70.8%
% of page views to articles w/ sub-articles	71.0%
Avg # of sub-article per article	7.5

Outline

1. Motivation and problem
2. Step 1: Filter sub-article candidates
3. Step 2: Develop training datasets
4. Step 3: Classify sub-article relationship
5. **Discuss: audience-author mismatch**
6. Summary

Discussion: audience-author mismatch

Audience

Communication



Discussion: audience-author mismatch

Audience

Author

Communication



Discussion: audience-author mismatch

Audience

Author

Communication



Wikipedia



Images from: https://www.youtube.com/watch?v=ikkg4NobV_w

Images from: Wikimedia Commons

Images from: https://clubrunner.blob.core.windows.net/00000050227/Images/community_icon-300x300.png



Article-as-concept in Wikidata

- 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
- فارسی
- Français
- کوردیی ناوەندی
-  Edit links

Family of Donald Trump

From Wikipedia, the free encyclopedia

This article is about the immediate family of Donald Trump. For the l

The **family of Donald Trump**, the **President of the United States**, is a prominent American family active in real estate, entertainment, business, and politics. Donald Trump's immediate family circle is the **First Family of the United States**. They are part of the broader **Trump family** originating from **Germany**. Donald Trump has children from three different women; Ivana Trump, Marla Maples, and Melania Trump.

Contents [hide]

- Immediate family
 - Ivana Trump
 - Marla Maples
 - Melania Trump
 - Children
 - Don Jr., Ivanka, and Eric Trump
 - Tiffany Trump
 - Barron Trump
 - Grandchildren
- Ancestry
 - Parents
 - Fred Trump
 - Mary Anne MacLeod Trump
 - Grandparents
 - Frederick Trump
 - Elizabeth Christ Trump
 - Relatives
 - John G. Trump
 - Fred Trump Jr.
 - Maryanne Trump Barry
 - Robert Trump
 - Genealogical table

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家庭

特朗普有一個兄弟和兩個姊妹。他的姊姊**玛丽安娜·特朗普·巴里**是聯邦高等法院的法官。他的父親具德國血統，而母親來自蘇格蘭，17歲移民至美國紐約從事傭工，1936年認識特朗普的父親，並於1942年取得美國國籍。

特朗普先後有三任妻子，育有三子兩女。妻子分别为：



Property

Discussion

Read

View history

facet of (P1269)

topic of which this item is an aspect, item that offers a broader perspective on the same topic

aspect of | subitem of | topic of | subtopic of | main topic

[In more languages](#) Configure

Language	Label	Description
English	facet of	topic of which this item is an aspect, it offers a broader perspective on the sar
Chinese	父话题	此主题的主要方面
Spanish	faceta de	tema del cual este elemento es un asp
Traditional Chinese	所屬話題	此主题的主要方面

All entered languages

Limitations and Future Works

- Sub-article relationships that are explicitly encoded by editors
 - In future, search for implicit relationship

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- Good on High-Interest articles but struggled on random articles
 - In future, specific modelling on random articles

Limitations and Future Works

- Sub-article relationships that are explicitly encoded by editors
 - In future, search for implicit relationship
- Good on High-Interest articles but struggled on random articles
 - In future, specific modelling on random articles
- Integrate our system into Wikipedia-based technologies
 - E.g. MilneWitten

Summary

- Identified and problematized the article-as-concept assumption

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Summary

- Identified and problematized the article-as-concept assumption
- Described the first model to address the problem
- Discussed the audience-author mismatch in peer production
- We are releasing the system and the datasets

Thank You

From Wikipedia, the free encyclopedia
(Redirected from Thank you)

"**Thank you**" is a common expression of **gratitude**. It often refers to a **thank you letter**, a letter written to express appreciation.

シ
ム
ガ
エ
ル
心
キ
維
四

Look up **thank-you**, **thank you**, or **thankyou** in Wiktionary, the free dictionary.

Q&A

From Wikipedia, the free encyclopedia

Q & A, generally meaning "questions and answers", an **interview**, may also refer to:

シ
ム
ガ
エ
ル
心
キ
維
四

Look up **Q and A** in Wiktionary, the free dictionary.

Images from: https://en.wikipedia.org/wiki/Thank_You | <https://en.wikipedia.org/wiki/Q%26A>

Problematizing and Addressing the Article-as-Concept Assumption in Wikipedia

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