

VoxEL: A Benchmark Dataset for Multilingual Entity Linking [†]

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October 10, 2018

[†] ISWC 2018 - The 17th International Semantic Web Conference

Example

Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson, Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

Example - Entity Recognition

Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson, Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

Example - Entity Disambiguation

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Martin Bashir

From Wikipedia, the free encyclopedia

For the former *MTV* showee, see [Martin Bashir \(TV series\)](#).

Martin Henry Bashir (born 19 January 1960) is a British journalist.

After initially gaining prominence on British television with his ABC interview with Diana, Princess of Wales, he became a controversial fly-on-the-wall documentary by pop singer Michael Jackson on *ITV*. Bashir was a political commentator for *MSNBC*, hosting *Meet Martin Bashir* and a correspondent

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Joe Jackson (manager)

From Wikipedia, the free encyclopedia

Joseph Walter Jackson (born July 28, 1930) is an American talk show manager, and is the patriarch of the Jackson family. He is best known for managing the pop stars Michael Jackson and Janet Jackson.

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Early life and ancestry [edit](#)

Jackson was born to Abram Jackson (1880–1982),¹ an university professor, and Crystal Lee King (1890–1972).² His parents were from Mississippi and moved to California in 1920, according to the Adams Black Hall of Fame and Kilbourn in Jackson's basic family history. "The Jacksons" is a name that Jackson chose for his children, which included brothers LaVerne (b. 1937) and Luther and sisters Janet (b. 1942) and Rebbie (b. 1944). Jackson was the son of Abram Jackson (1880–1982), a doctor, and Crystal Lee King (1890–1972).

Death at an event

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U.S. Steel

From Wikipedia, the free encyclopedia

(Redirected from [US Steel](#))

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United States Steel Corporation

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Michael Jackson

From Wikipedia, the free encyclopedia

For other people named Michael Jackson, see [Michael Jackson \(disambiguation\)](#).

King of Pop (real-life name). For other uses, see [King of Pop \(disambiguation\)](#).

Michael Joseph Jackson (August 29, 1958 – June 25, 2009) was an American singer, songwriter, and dancer. Dubbed the “King of Pop”, he was one of the most successful and influential entertainers of all time, selling more records during the course of his life than any other artist. Jackson’s contributions to music, dance, and culture have earned him numerous awards and accolades, making him a global icon and a cultural phenomenon for over four decades.

The eighth child of the Jackson family, Michael made his first public appearance in 1964 in the Jackson 5’s first single, “I Want You Back”. Jackson, Tito, Jermaine, and Marlon as members of the Jackson 5, began their solo career in 1971 while at Motown Records. In the mid-1980s, Jackson became a dominant figure in popular music. Jackson’s vocal

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Living with Michael Jackson

From Wikipedia, the free encyclopedia

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Living with Michael Jackson

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Applications

- Semantic Search
- Semantic Annotations
- Relation Extraction
- Topic Extraction

Name Variations in Entity Linking

Michael Joseph Jackson

Michael J. Jackson

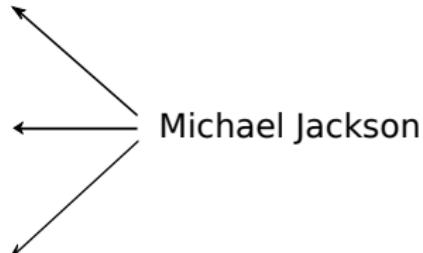
King of Pop

The screenshot shows the English Wikipedia page for "Michael Jackson". The page title is "Michael Jackson" and it is described as "From Wikipedia, the free encyclopedia". Below the title, there is a summary section with a note about other people named Michael Jackson and a link to "King of Pop". The main content discusses Michael Joseph Jackson's life and career, mentioning his status as one of the most popular entertainers and his contributions to music, dance, and fashion. A black and white photograph of Michael Jackson singing into a microphone is displayed on the right side of the page.

Name Variations in Entity Linking

Three screenshots of Wikipedia pages for "Michael Jackson" illustrating name variations:

- Michael Jackson (singer)**: A page for Michael Joseph Jackson, an American singer, songwriter, and dancer. It includes a photo of him singing.
- Michael Jackson (writer)**: A page for Michael James Jackson, an English writer and journalist. It includes a photo of him.
- Michael Jackson (actor)**: A page for Michael Jackson, a Canadian actor, griller, and his acting role as "Trevor" in the comedy TV series *Trailer Park Boys*. It includes a photo of him.



Multilingual Entity Linking - English

The figure displays three separate Wikipedia article pages:

- Martin Bashir**: A British journalist. Below the bio is a photo of him.
- Joe Jackson (manager)**: Joseph Walter Jackson, a manager for Michael Jackson. Below the bio is a photo of him.
- U.S. Steel**: An American integrated steel producer. To the right is the company's logo.

Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson, Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

The figure displays two Wikipedia articles:

- Michael Jackson**: The King of Pop. Below the bio is a photo of him singing.
- Living with Michael Jackson**: A television documentary. Below the bio is a thumbnail image of the show's title card.

Multilingual Entity Linking - Italian

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Martin Bashir

From Wikipedia, the free encyclopedia

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After initially gaining prominence on British television with his BBC interview with Diana, Princess of Wales, he became a controversial fly-on-the-wall documentary with pop singer Michael Jackson on *ITV*. Bashir was a political commentator for *MSNBC*, hosting *Meet the Press* and *Meet the Press Weekend*.

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[Early life and ancestry](#) [edit]

Jackson was born to [Samuel Jackson](#) (1880–1981), a tobacco producer, and [Crystal Lee King](#) (1887–1967). He had three brothers and two sisters. His father died in 1928, and his mother died in 1958. In 1929, according to the [Adams Black Hall of Fame and Hall of Fame](#) in Jackson's home city, "The Jacksons were the first black family to have five children, which included brothers [Laurence](#) (bed 202) and [Lester](#) and sisters [Lois](#) and [Vernie](#). [Lois](#) married into the son of [Samuel Lockett](#) (bed 201).

[Jackson](#) was an avid reader of books, particularly



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Joseph Walter "Joe" Jackson, era un operaio siderurgico presso U.S. Steel.

In un'intervista con Martin Bashir per il documentario del 2003 Living with Michael Jackson, Jackson ha ricordato che Joe spesso sedeva su una sedia con una cintura in mano mentre lui e i suoi fratelli provavano.

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Michael Jackson

From Wikipedia, the free encyclopedia

For other people named Michael Jackson, see [Michael Jackson \(disambiguation\)](#).

King of Pop (realname [Michael Jackson](#))

25. 2009 was an American singer, songwriter, and dancer. Dubbed the "King of Pop", he was one of the most successful and influential entertainers of the late 20th century, writing some of the best-selling music during the time of his death. Jackson's contributions to music, dance, and culture have earned him recognition as one of the most iconic figures of the 20th century. He has sold over four decades.

The eighth child of the Jackson family, Michael made his debut on stage at the age of 10 in the Jackson 5. Jackson, [Tina](#), [Jermaine](#), and [Marlon](#) as members of the Jackson 5. He began his solo career in 1971 while at Motown Records, the label he made famous. Jackson was a dominant figure in popular music, the music videos,



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Living with Michael Jackson is a television documentary in which [Martin Bashir](#) interviewed [Michael Jackson](#) over a span of 8 months, from May 2002 to January 2003, about different aspects of his life and preparation for his final tour in the United Kingdom on *ITV* (as a "special" tonight) on February 3, 2003, and in the United States 3 days later on *ABC*, introduced by [Barbara Walters](#).

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Multilingual Entity Linking - Spanish

The diagram illustrates multilingual entity linking across three English Wikipedia pages:

- Martin Bashir**: An interviewee in the documentary "Living with Michael Jackson".
- Joe Jackson (manager)**: Joseph Walter Jackson, Michael Jackson's father.
- U.S. Steel**: The company where Michael Jackson worked.

Entity links are shown as arrows connecting the names of the interviewee, his father, and his employer within the same document.

Joseph Walter “Joe” Jackson, era un trabajador siderúrgico en U.S. Steel. En una entrevista con Martin Bashir para el documental del 2003 Living with Michael Jackson, Jackson recordó que Joe a menudo se sentaba en una silla con un cinturón en la mano mientras él y sus hermanos ensayaban.

The diagram illustrates multilingual entity linking across two English Wikipedia pages:

- Michael Jackson**: The subject of the documentary.
- Living with Michael Jackson**: The documentary itself.

Entity links are shown as arrows connecting the interviewee (Michael Jackson) to the documentary he was featured in.

Datasets

Dataset	D	S	E	Mn	Languages
AIDA/CoNLL-Complete	1393	22,137	34,929	✓	EN
KORE50	50	50	144	✓	EN
IITB	103	1,781	18,308	✓	EN
ACE2004	57	-	306	✗	EN
AQUAINT	50	533	727	✗	EN
MSNBC	20	668	747	✗	EN
DBpedia Spotlight	10	58	331	✓	EN
N3-RSS 500	1	500	1000	✓	EN
Reuters 128	128	-	881	✓	EN
Wes2015	331	-	28,586	✓	EN
News-100	100	-	1656	✓	DE
Thibaudet	1	3,807	2,980	✗	FR
Bergson	1	4,280	380	✗	FR
SemEval 2015 Task 13	4	137	769	✓	EN,ES,IT
DBpedia Abstracts	39,132	-	505,033	✗	DE,EN,ES,FR,IT,JA,NL
MEANTIME	120	597	2,790	✓	EN,ES,IT,NL

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N3-RSS 500	1	500	1000	✓	EN
Reuters 128	128	-	881	✓	EN
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Goals

- ① Create a benchmark dataset for multilingual Entity Linking

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Die europäische Sozialdemokratie kämpft ums politische Überleben

THE CRISIS OF THE EUROPEAN LEFT:
Are social democrats still alive?

10. Januar 2018 – DER SPIEGEL (HAMBURG)

In ganz Europa kämpfen sozial Bedeutungsverlust. Eine der ältesten Bestandsaufnahme.

Marcel Pauly

*In einem konstitutionellen St.

10 January 2018 – DER SPIEGEL (HAMBURG)

All across Europe, social democratic p the oldest political ideologies is in cri

Marcel Pauly

In a constitutional state, the true rule Lassalle, the champion of workers and democracy. But in the meantime, the V

11. Januar 2018 – DER SPIEGEL (HAMBURG)

En toda Europa, los partidos socialdemócratas luchan para relevantes. Una de las más antiguas ideologías en crisis. Pactual.

Marcel Pauly

*En un Estado constitucional, el verdadero gobernante es c

11 enero 2018 – DER SPIEGEL (HAMBURG)

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10 gennaio 2018 – DER SPIEGEL (AMBURGO)

In tutta Europa i partiti socialdemocratici devono vedersela con la perdita di consensi. Una delle più antiche idee politiche è in crisi. Il punto della situazione.

Marcel Pauly

*In uno stato costituzionale il vero sovrano è l'elettorato', diceva un tempo

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Example - Any other entity?

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Martin Bashir

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After initially gaining prominence on British television with his BBC interview with Diana, Princess of Wales, he became a controversial fly-on-the-wall documentary by pop singer Michael Jackson on ITV. **It's Not Me** was a political commentator for MSNBC, hosting **Meet the Press**.

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Early life and ancestry [edit]

Jackson was born to Abram Jackson (1880–1908),¹ an university professor, and Crystal Lee King (1890–1962).² He had three brothers and two sisters. His father died when he was 10 years old.³ In 1920, he moved with his mother and siblings to the Adams Black Hall of Fame and Kalamazoo in Jackson's home town. "The Black Hall of Fame" was a hotel run by African Americans, which included brothers Lawrence (Bob) (1921) and Luther and sisters LaVern (1923) and Vernon (1926). Jackson was the son of LaVern Jackson (1926–1997), a housewife, and the son of Bob Jackson (1921–1997).

Death [edit]

Joe Jackson died on April 27, 2009, at the age of 92, in Las Vegas, Nevada.

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The eighth child of the Jackson family, Michael made his first public appearance in 1964 in the Jackson 5. Jackson, Tito, Jermaine, and Marlon as members of the Jackson 5 began their solo career in 1971 while at Motown Records. In the mid-1980s, Jackson became a dominant figure in popular music. Jackson's vocal

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Example - Any other entity?

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Death at an event in 2007

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The eighth child of the Jackson family, Michael made his first public appearance at the age of three months with his brothers Jackie, Tito, Jermaine, and Marlon as a member of the Jackson 5. He began his solo career in 1971 while at Motown Records, the label made famous by Jackson's dominant figure in popular music. Jackson's vocal,



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Living with Michael Jackson

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Living with Michael Jackson is a television documentary in which Martin Bashir interviewed Michael Jackson over a span of 8 months, from May 2002 to January 2003, about different aspects of his life and career, first in the United Kingdom on *ITV* (as a “Special” night) for February 3, 2003, and in the United States 3 days later on *ABC*, introduced by *Barbara*.



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Wikipedia
The Free Encyclopedia

Martin Bashir

From Wikipedia, the free encyclopedia

Martin Henry Bashir (born 19 January 1960) is a British journalist.

After initially gaining prominence on British television with his BBC interview with Diana, Princess of Wales, he became a controversial fly-on-the-wall documentaryist with pop singer Michael Jackson on *ITV*. Bashir was a political commentator for *MSNBC*, hosting *Meet the Press*.

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Wikipedia
The Free Encyclopedia

Joe Jackson (manager)

From Wikipedia, the free encyclopedia

Joseph Walter Jackson (born July 28, 1910) is an American talent manager, and is the patriarch of the Jackson family, which includes the pop stars Michael Jackson and Janet Jackson.

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[Early life and ancestry](#) [edit](#)

Jackson was born to Abram Jackson (1880–1982),¹ an university professor, and Crystal Lee King (1890–1970).² He had three brothers and two sisters. His father died in 1929, according to the Adams Black Hall of Fame and Kilkenny in Jackson's basic family history. "The Jacksons" were a musical family, and Jackson had four children, which included brothers LaVerne (bed 2001) and Luther and sisters Latrice and Venita Mae. Jackson was the son of Abram Jackson (1880–1982), a doctor, dentist, record collector and rock and roll historian.

Joe Jackson at an event in 2007

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Wikipedia
The Free Encyclopedia

U.S. Steel

From Wikipedia, the free encyclopedia
(Redirected from US Steel)

The United States Steel Corporation (NYSE: X) more commonly known as **U.S. Steel**, is an American integrated steel producer headquartered in Pittsburgh, Pennsylvania, with production centers in the United States, Canada, and Central Europe. As of 2010, the company was the world's 24th largest steel producer and second largest domestic

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[Type](#) [Public](#) [Traded as](#) [NYSE: X](#) [S&P 400 Component](#) [Industry](#)

United States Steel Corporation



Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson, Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

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Wikipedia
The Free Encyclopedia

Michael Jackson

From Wikipedia, the free encyclopedia

Michael Joseph Jackson (May 29, 1958 – June 25, 2009) was an American singer, songwriter, and dancer. Dubbed the “King of Pop”, he was one of the most successful recording artists of all time, with the best-selling music artist during the time of his death.¹ Jackson’s contributions to music, dance, and culture have earned him numerous awards and made him a global icon. His influence can be seen over four decades.

The eighth child of the Jackson family, Michael made his first public appearance in 1964 in the Jackson 5. Jackson, Tito, Jermaine, and Marlon as members of the Jackson 5 began their solo career in 1971 while at Motown. In the mid-1980s, Jackson became a dominant figure in popular music. Jackson's vocal

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Michael Jackson



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Wikipedia
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Martin Bashir

From Wikipedia, the free encyclopedia

For the former *MTV* showee, see [Martin Bashir \(TV series\)](#).

Martin Henry Bashir (born 19 January 1960) is a British journalist.

After initially gaining prominence on British television with his ABC interview with Diana, Princess of Wales, he became a controversial fly-on-the-wall documentary by pop singer Michael Jackson on *ITV*. Bashir was a political commentator for *MSNBC*, hosting *Msnbc.com's* *Meet the Press*.



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Joe Jackson (manager)

From Wikipedia, the free encyclopedia

Joseph Walter Jackson (born July 28, 1930) is an American talent manager, and is the patriarch of the Jackson family. He is best known for which includes the pop icon Michael Jackson and Janet Jackson.

Contents [show]

Early life and ancestry [edit]

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Death at an event in 2007

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U.S. Steel

From Wikipedia, the free encyclopedia
(Redirected from [US Steel](#))

The United States Steel Corporation ([NYSE: X](#)), more commonly known as [U.S. Steel](#), is an American integrated steel producer headquartered in Pittsburgh, Pennsylvania, with production centers in the United States, Canada, and Central Europe. As of 2010, the company was the world's 24th largest steel producer and second largest domestic



Type Public
Traded as NYSE: X
S&P 400 Component
Industry

Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson, Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

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Michael Jackson

From Wikipedia, the free encyclopedia

For other people named Michael Jackson, see [Michael Jackson \(disambiguation\)](#).

King of Pop (real-life name). For other uses, see [King of Pop \(disambiguation\)](#).

Michael Joseph Jackson (August 29, 1958 – June 25, 2009) was an American singer, songwriter, and dancer. Dubbed the “King of Pop”, he was one of the most successful recording artists of all time, with the best selling music artist during the time of his death.¹ Jackson's contributions to music, dance, and culture have earned him multiple awards and titles, making him a global icon and popular figure for over four decades.

The eighth child of the Jackson family, Michael made his first public appearance at the age of two years old. Jackson, Tito, Jermaine, and Marlon as members of the Jackson 5 began their solo careers in 1971 while at Motown. In the mid 1980s, Jackson became a dominant figure in popular music. Jackson's vocal



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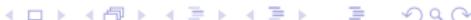
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Genre Documentary



Example annotations produced by four EL systems

Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson, Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

Example annotations produced by four EL systems

Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson, Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

D|T D|T B|D A|B|T D|T
A|D|T D B|T A|B|D
A|B A T D|T T
D|T

Example annotations produced by four EL systems

Aida

Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview
with Martin Bashir for the 2003 documentary Living with Michael Jackson,
Jackson recalled that Joe often sat in a chair with a belt in his hand as he and
his siblings rehearsed.

D|T D|T D|T D|T
A|D|T D B|T A|B|D
A|B A T D|T
D|T

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Aida

Babelfy

Joseph Walter “Joe” Jackson, was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson, Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

D
D|T
B|D
A|B|T
D|T
A|D|T
D
B|T
A|B|D
A|B
A
T
D|T
T
D|T
D|T

Example annotations produced by four EL systems

Aida

Babelfy

DBpedia Spotlight

Joseph Walter “Joe” Jackson was a steelworker at U.S. Steel. In an interview with Martin Bashir for the 2003 documentary Living with Michael Jackson. Jackson recalled that Joe often sat in a chair with a belt in his hand as he and his siblings rehearsed.

D D|T B|D A|B|T D|T A|D|T D B|T A|B|D A|B

Example annotations produced by four EL systems

Aida

Babelfy

DBpedia Spotlight

TagME

Joseph Walter “Joe” Jackson, was a steelworker _D at U.S. Steel _{B|D A|B|T}. In an interview _{D|T} with Martin Bashir _{A|D|T} for the 2003 documentary _D Living with Michael Jackson, _{B|T A|B|D} Jackson recalled that Joe often sat in a chair _A with a belt _T in his hand _T as he and his siblings _{D|T} rehearsed.

- What should Entity Linking link?

Datasets

Dataset	D	S	E	Mn	Languages
AIDA/CoNLL-Complete	1393	22,137	34,929	✓	EN
KORE50	50	50	144	✓	EN
IITB	103	1,781	18,308	✓	EN
ACE2004	57	-	306	✗	EN
AQUAINT	50	533	727	✗	EN
MSNBC	20	668	747	✗	EN
DBpedia Spotlight	10	58	331	✓	EN
N3-RSS 500	1	500	1000	✓	EN
Reuters 128	128	-	881	✓	EN
Wes2015	331	-	28,586	✓	EN
News-100	100	-	1656	✓	DE
Thibaudet	1	3,807	2,980	✗	FR
Bergson	1	4,280	380	✗	FR
SemEval 2015 Task 13	4	137	769	✓	EN,ES,IT
DBpedia Abstracts	39,132	-	505,033	✗	DE,EN,ES,FR,IT,JA,NL
MEANTIME	120	597	2,790	✓	EN,ES,IT,NL

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N3-RSS 500	1	500	1000	✓	EN
Reuters 128	128	-	881	✓	EN
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MEANTIME	120	597	2,790	✓	EN,ES,IT,NL

Goals

- ① Create a benchmark dataset for multilingual Entity Linking

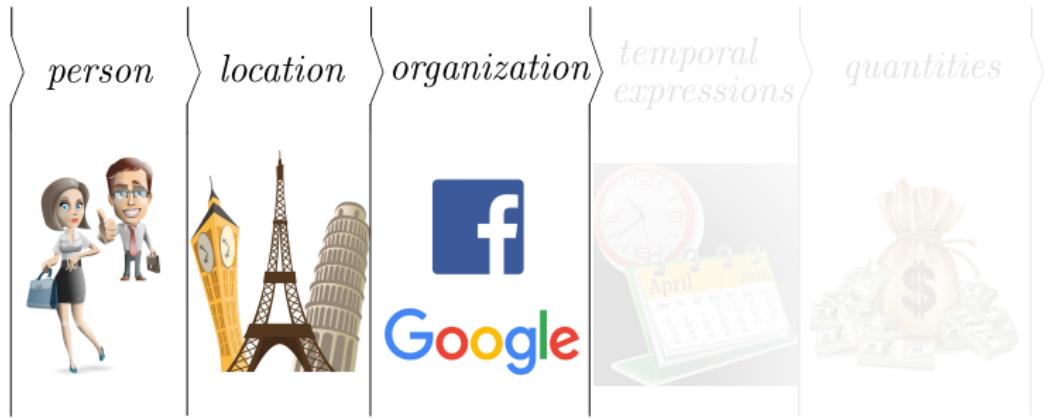
Goals

- ① Create a benchmark dataset for multilingual Entity Linking
- ② Create two versions of the dataset: strict and relaxed.

Strict version: class-based definition



Strict version: class-based definition



Strict version: class-based definition

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The screenshot shows the Wikipedia article page for "Living with Michael Jackson". At the top, there are tabs for Article, Talk, Read, Edit, View history, and Search Wikipedia. Below the title "Living with Michael Jackson" and subtitle "From Wikipedia, the free encyclopedia", there is a summary of the documentary's content. To the right of the summary is a thumbnail image of the documentary's title card, which features a crown and the text "LIVING WITH MICHAEL JACKSON". Below the title card, it says "Genre Documentary". On the left side of the page, there is a sidebar with links to Main page, Contents, Featured content, Current events, Random article, Donate to Wikipedia, Wikipedia store, Interaction, Help, About Wikipedia, Community portal, Recent changes, and Contact page.



Relaxed version: Knowledge Base definition

The image displays four screenshots of Wikipedia articles, each with a sidebar on the left containing navigation links.

- Michael Jackson**: Article about Michael Jackson, the singer. Sidebar links include Main page, Contents, Featured content, Current events, Recent changes, 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, Wikipedia talk, and Cite this page.
- 2003**: Article about the year 2003. Sidebar links include Main page, Contents, Featured content, Current events, Recent changes, Donors' archive, Discussion, 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, Wikipedia talk, and Cite this page.
- Chair**: Article about a chair. Sidebar links include Main page, Contents, Featured content, Current events, Recent changes, Donors' archive, Discussion, 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, Wikipedia talk, and Cite this page.
- Belt (clothing)**: Article about a belt. Sidebar links include Main page, Contents, Featured content, Current events, Recent changes, Donors' archive, Discussion, 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, Wikipedia talk, and Cite this page.

The main content area for the "Belt (clothing)" article includes:

- A warning message: "This article has multiple issues. Please help improve it or discuss these issues on the talk page. (Learn how) [help]" with a yellow exclamation mark icon.
- A list of issues:
 - This article may require cleanup to meet Wikipedia's quality standards. (February 2003)
 - This article needs additional citations for verification. (May 2002)
- A paragraph: "A belt is a flexible band or strap, typically made of leather or heavy cloth, and worn around the waist. A belt supports trousers or other articles of clothing."
- A "Contents" section with a "Contents [view]" link.
- A "History" section with a "History [edit]" link.
- A thumbnail image of a red belt with gold embroidery.
- A detailed text block: "Belts have been documented as male clothing since the Bronze Age. Both genders have used them off and on, depending on the current fashion. In the western world, belts have been more common for men, with the exception of the early Middle Ages, late 17th-century Mantua, and skirt/belt combinations between 1800 and 1910. An Nouveau belt buckle is now a collectible item. In the latter half of the 19th century and until the First World War, the belt was a decorative as well as utilitarian part of military uniforms, particularly among officers. In the armed forces of Prussia, Tsarist Russia, and other Eastern European nations, it was common for officers to wear extremely tight pressing into their stomachs and getting them up, wide belts around the waist, on the outside of the uniform, both to support a saber and for aesthetic reasons. These tightly cinched belts served to draw in the waist and give the wearer..." followed by a "read more" link.

Creation of VoxEL dataset

- It is based on curated text from five languages.
- Same sentences by each corresponding document.
- Same annotations by each corresponding sentence.
- Revision process.

Summary

one language

$|D|:15$

$|S|: 94$

$|A_s|:204$

$|A_r|:674$

Summary

five languages

one language

$$|D|:15$$

$$|S|: 94$$

$$|A_s|:204$$

$$|A_r|:674$$

$$|D|:75$$

$$|S|: 470$$

$$|A_s|:1020$$

$$|A_r|:3370$$

$\times 5 =$

Summary

strict and relaxed versions

five languages		
one language		
$ D :15$	$ D :75$	$ D :150$
$ S : 94$	$ S : 470$	$ S : 940$
$ A_s :204$	$ A_s :1020$	$ A :4390$
$ A_r :674$	$ A_r :3370$	

Experiments

① GERBIL Evaluation of state-of-the-art approaches

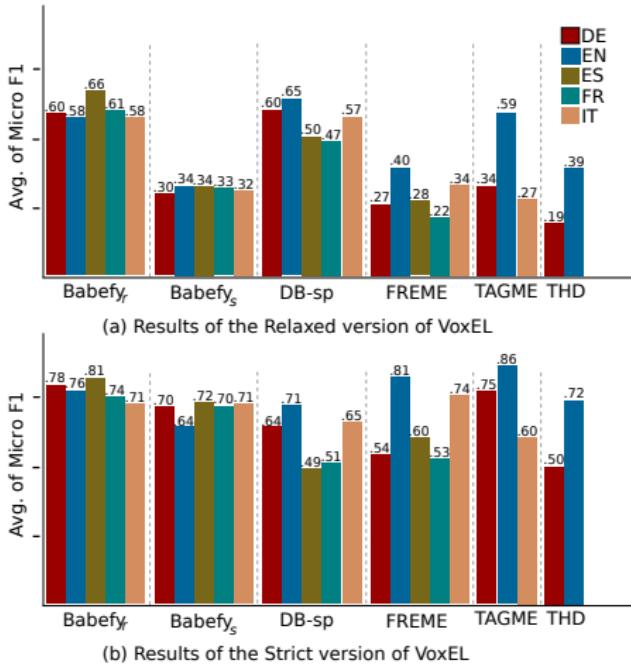
Experiments

Name	Year	Evaluated Languages	ER	Demo	Src	API
KIM	2004	EN,FR,ES	✓	✓	✗	✓
<i>TagME</i>	2010	DE,EN,NL	✓	✓	✗	✓
SDA	2011	EN,FR	✓	✗	✗	✗
ualberta	2012	EN,ZH	✓	✗	✗	✗
HITS	2012	EN,ES,ZH	✓	✗	✗	✗
THD	2012	DE,EN,NL	✓	✓	✓	✓
<i>DBpedia Spotlight</i>	2013	DA,DE,EN,ES,FR,HU,IT,NL,RU	✓	✓	✓	✓
Wang-Tang	2013	EN,ZH	✓	✗	✗	✗
AGDISTIS	2014	DE,EN	✗	✓	✓	✓
<i>Babelfy</i>	2014	DE,EN,ES,FR,IT	✓	✓	✗	✓
<i>FREME</i>	2016	DE,EN	✓	✗	✓	✓
WikiME	2016	AR,DE,EN,ES,FR,HE,IT,TA,TH,TL,TR,UR,ZH	✓	✓	✗	✗
FEL	2017	EN,ES,ZH	✓	✗	✓	✗
FOX	2017	DE,EN,ES,FR,NL	✓	✓	✓	✓
MAG	2017	DE,EN,ES,FR,IT,JA,NL	✗	✓	✓	✓

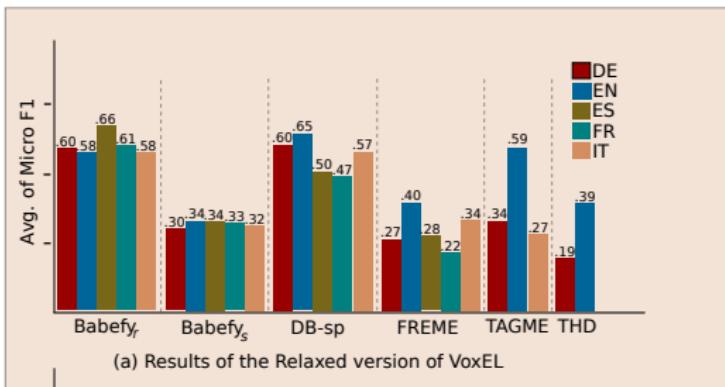
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<i>FREME</i>	2016	DE,EN	✓	✗	✓	✓
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FEL	2017	EN,ES,ZH	✓	✗	✓	✗
FOX	2017	DE,EN,ES,FR,NL	✓	✓	✓	✓
MAG	2017	DE,EN,ES,FR,IT,JA,NL	✗	✓	✓	✓

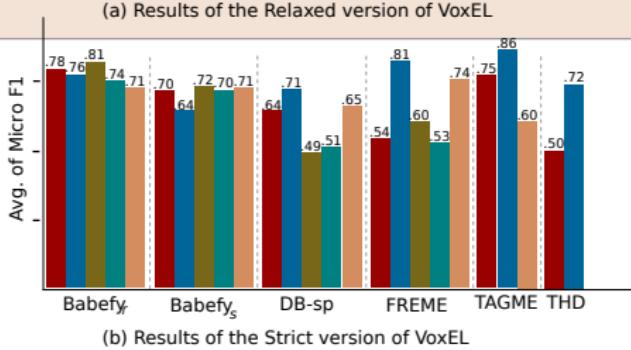
Experiments



Experiments

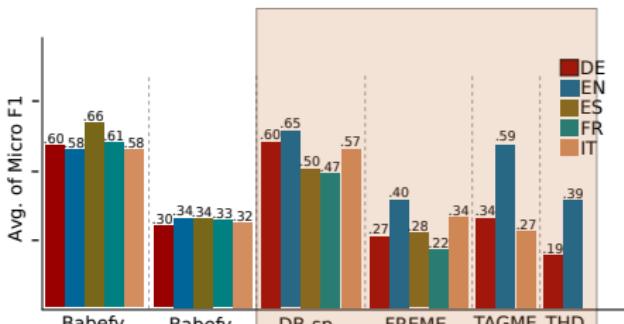


(a) Results of the Relaxed version of VoxEL

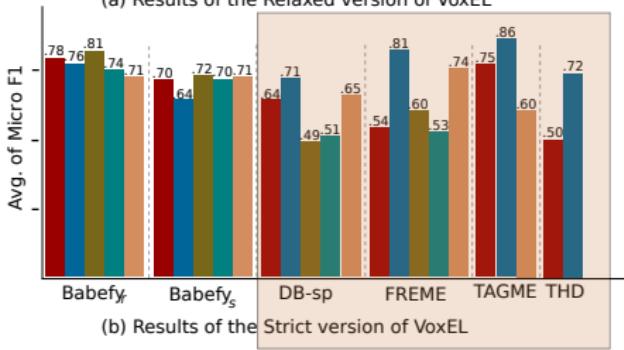


(b) Results of the Strict version of VoxEL

Experiments

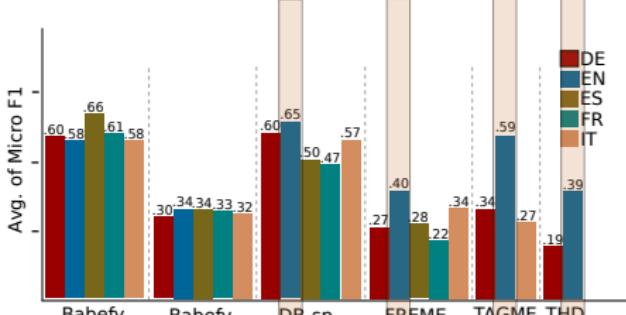


(a) Results of the Relaxed version of VoxEL

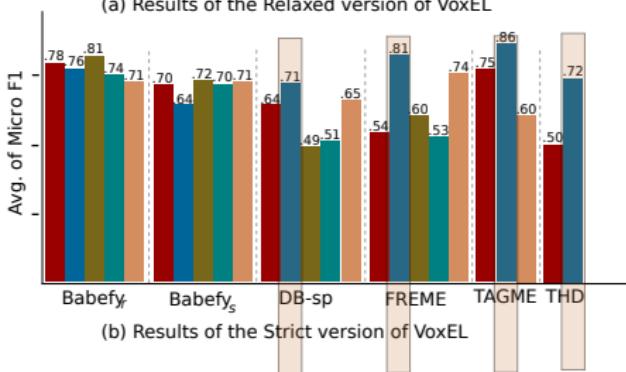


(b) Results of the Strict version of VoxEL

Experiments



(a) Results of the Relaxed version of VoxEL



(b) Results of the Strict version of VoxEL

Experiments

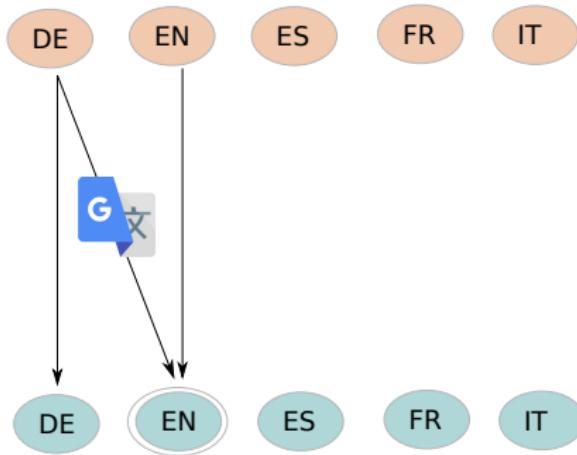
- ① GERBIL Evaluation of state-of-the-art approaches

Experiments

- ① GERBIL Evaluation of state-of-the-art approaches
- ② Evaluate the performance of state-of-the-art approaches using machine translation.

Experiments

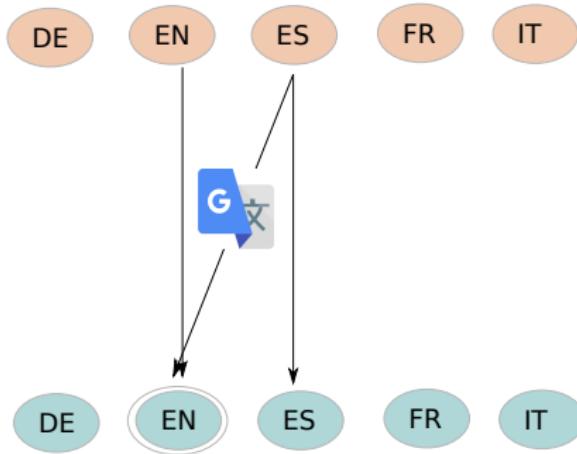
Input Text



System Configuration

Experiments

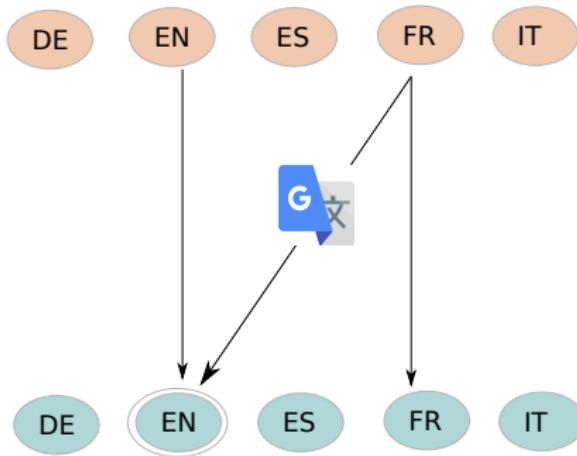
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System Configuration

Experiments

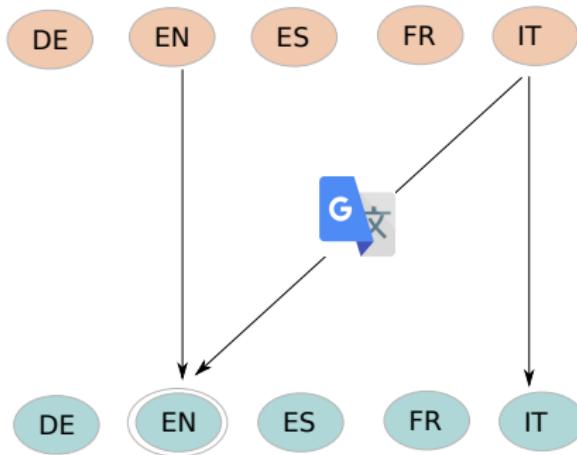
Input Text



System Configuration

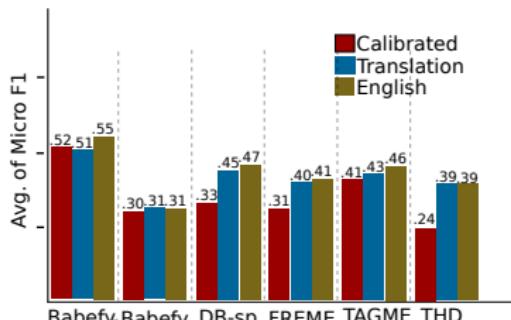
Experiments

Input Text

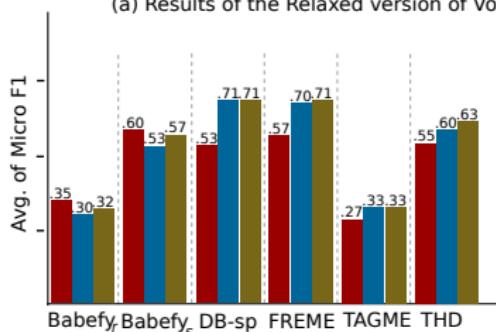


System Configuration

Experiments



(a) Results of the Relaxed version of VoxEL



(b) Results of the Strict version of VoxEL

Conclusion

Our main contribution is VoxEL
(<https://dx.doi.org/10.6084/m9.figshare.6539675>)

- Most systems perform (much) better for English.
- Machine Translation could be an option to address multilingual domains in Entity Linking.

Poster P20: Machine Translation vs. Multilingual Approaches for Entity Linking



Joseph Walter "Joe" Jackson, was a steelworker at U.S. Steel. In an interview wi Joseph Walter "Joe" Jackson, era un operaio siderurgico presso U.S. Steel. Ja In Joseph Walter "Joe" Jackson, era un trabajador siderúrgico en U.S. Steel. En his Mi una entrevista con Martin Bashir para el documental del 2003 Living with Michael Jackson, Jackson recordó que Joe a menudo se sentaba en una silla con un cinturón en la mano mientras él y sus hermanos ensayaban.

- Do Entity Linking systems perform better for English or for other languages?
- Which perform better DBpedia Spotligh or Babelfy?
- Why dont just use Machine Translation?

VoxEL: A Benchmark Dataset for Multilingual Entity Linking [†]

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October 10, 2018

[†] ISWC 2018 - The 17th International Semantic Web Conference