

DBpedia – Live



Kollaborative Ontologieerstellung
durch die Wikipedia/DBpedia-Gemeinschaft

Sebastian Hellmann
AKSW

UNIVERSITÄT LEIPZIG

Gliederung

- Wikipedia
- DBpedia – Überblick (AKSW, FU Berlin, OpenLink)
- Kollaborative Ontologieverstellung
- Live Extraktion



Wikipedia

Im Spiegel am 19.04.2010:

“Wikipedia ist die größte Enzyklopädie der Welt, bald könnte sie die einzige verbliebene sein.

Der gedruckte Brockhaus, Microsofts CD-Rom-Lexikon Encarta sind eingestellt, die Encyclopædia Britannica hat wirtschaftliche Probleme. [...]

Diese Aufgabe ist an das Kollektiv der Internetnutzer übergegangen.”

Wikipedia

- **Nature am 15.12.2005:**

Vergleich von 42 wissenschaftlichen Artikeln

Wikipedia **ca. 4 Fehler pro Artikel**

Encyclopædia Britannica **ca. 3 Fehler pro Artikel**

Fehler in Wikipedia wurden zeitig behoben.

[Jim Giles, Internet encyclopaedias go head to head Nature 438, 900-901 (15 December 2005)]

Wikipedia

London 7.7.2005, 8:50 Uhr

Bombenanschlag auf die Londoner U-bahn

- Erster Eintrag in Wikipedia **18 Minuten später**
- **2500 Benutzer** erstellen innerhalb von **12 Stunden** einen **14-seitigen Artikel**, der alle anderen herkömmlichen Medienberichte im Detailgrad weit übertrifft.

[Tapscott & Williams, Wikinomics]

Wikipedia

- hochaktuell
- wenige Fehler, die schnell korrigiert werden können
- DAS Wissenskompodium der Menschheit

Wie kann das in Wikipedia vorhandene Wissen aufgeschlüsselt und nutzbar gemacht werden?

Wikipedia als Wissensbasis



- Einfache Fragen:
 - Bei welche Filmen von Tarantino hat Bruce Willis mitgespielt?
 - Wie heissen die Bürgermeister von Europäischen Städten mit einer Einwohnerzahl zwischen 20.000 und 100.000 Einwohnern?
 - Welche Fussballspieler haben als Torwart für einen Verein gespielt, der ein Stadium mit mehr als 40.000 Plätzen hat und wurden in einem Land geboren, dass mehr als 10 Millionen Einwohner hat?
- **Die Antworten sind in Wikipedia vorhanden!**

Wissen in Wikipedia

- Title
- Abstract
- Infoboxes
- Geo-coordinates
- Categories
- Images
- Links
 - other language versions
 - other Wikipedia pages
 - To the Web
 - Redirects
 - Disambiguations

04.05.2010

DBpedia, AKSW, LSWT

14,544 people have donated [\(show more\)](#)

Busan

From Wikipedia, the free encyclopedia

"**Pusan**" redirects here. For the Vedic Hindu god, see Pūshan.

Busan Metropolitan City, also known as **Pusan**^[i] is the largest port city in the Republic of Korea. With a population of about 3.66 million, Busan is also South Korea's second largest metropolis, after Seoul. The most densely built up areas of the city are situated in a number of narrow valleys between the Nakdong River and Suayong River, with mountains separating some of the various districts.

Busan was the host city of the 2002 Asian Games and APEC 2005. It was also one of the host cities for the 2002 FIFA World Cup, and is the center for international conventions in Korea. Administratively, it is designated as a Metropolitan City. On November 14, 2005, the city officially announced its bid to host the 2020 Summer Olympics Games.^[i]

Contents [hide]

History

Gaehŏnŏng-guk existed in the second and third centuries as a subdivision of Jinhan. It was absorbed by Silla and renamed Geochŏnŏng-gun. The word Geochŏnŏng means rough mountain, probably referring to Hwangnyŏngsan, located at the center of the city.

The grave goods excavated from mounded burials at Bolcheon-dong indicate that a complex chieftain ruled by powerful individuals was present in the Busan area just as the Three Kingdoms of Korea were forming, c. A.D. 300-400. The mounded burials of Bolcheon-dong were built along the top of a ridge that overlooks a wide area that makes up parts of modern-day Dongnae-gu and Yeongju-gu. Archaeologists excavated more than 250 iron weapons and ingots from Burial No. 38, a wooden chamber tomb at Bolcheon-dong.

In 757, Geochŏnŏng-gun was again renamed Dongnae, which it is still called.

From the beginning of the fifteenth century, the Korean government designated Busan as a trading port with the Japanese and allowed their settlement. Other Japanese settlements in Ulsan and Jinhae diminished later, but the Busan settlement, called Waegwan at the time, continued until Japan invaded Korea in 1592. After the war, diplomatic relations with the new shogunate in Japan were established in 1607, and Busan Waegwan was permitted to be reconstructed. The Japanese settlement, though relocated into Cheryang later, continued to exist until Korea was exposed to modern diplomacy in 1876. In 1878, Busan became the first international port in Korea.

During the Japanese occupation, Busan developed into a hub trading port with Japan. Busan was the only city in Korea to adopt the steam tramway before electrification was introduced in 1924. And Busan is the only city in Korea, with the exemption of Daejeu, that was never taken by the North Korean Communists during the Korean War. As a result the city was a refugee camp site for Koreans during the war.

Busan was one of the few areas in Korea that remained under the control of South Korea throughout the Korean War and for some time it was the capital of Republic of Korea. UN troops established a defensive perimeter around the city known as the Pusan Perimeter in the summer and autumn of 1950. Since then, like Seoul, the city has been a self-governing metropolis and has built a strong urban character.

Administrative divisions

In 1957 Busan adopted a division system with the creation of 6 gu: Busanjin-gu, Dong-gu, Dongnae-gu, Jung-gu, Seogu, and Yeongdo-gu.

Today, Busan is divided into 15 gu (districts) and 1 gun (county).

- Buk-gu (북구, 北區)
- Busanjin-gu (부산진구, 釜山鎭區)
- Dongsu-gu (동수, 東區)

Economy

Transportation and shipping are among the most high profile aspects of the local economy. Since 1978, Busan has opened three container ports including Jassungdae, Shinundae and Gamman. Busan is renowned as one of the world's largest ports and can handle up to 6.4 million TEU shipping containers per year.

The Busan-Jinhae Free Economic Zone Authority, one of two such administrations (the other in the harbor of Incheon), was created to continue the tradition of Busan's status as an international trading centre. The port attracts ships from all over the globe and aspires to become a regional financial centre. Currently, Busan is ranked internationally as the third largest seaport in terms of cargo volume and efficiency by the ADP.

Shopping and Commerce

Commercial areas are dispersed throughout the city near busy intersections and adjacent to university campuses, but the two largest central business districts in Busan are Seomgyeong and Gwangbok-dong/Nampo-dong. There are also four substantial shopping areas of note: Seomyeong, Gwangbok-dong, Busan Dae Hakap in Jangjeon-dong, and Haeundae.

Seomyeong is the crossroads of Busan. The local subway station serves two lines and is one of the busiest in the city. The local head offices of Korean and international banks are located in Seomyeong. It is recognized as the ascendant shopping and entertainment districts with many cafes, bars, restaurants, department stores, shops, and offices. Directly adjacent to Seomyeong is Bubeok Market, the largest traditional market in the city.

The Gwangbok-dong, Nampo-dong, and Jungang-dong areas form the old central business district with many offices, cafes, bars, shops and restaurants. Some of the restaurants in this district are locally famous with family recipes passed down the generations. Jagalchi Market (near part of the very active port) is an area of narrow street stalls and is well known for its fish market. The Gulje Market is also located nearby. Jungang-dong is the home of many international law offices, the old Immigration Office, and the international ferry terminal serving Japanese routes. Lotte World II is currently under construction along the water between Jungang-dong 7-Che and 8-Che. When completed, Lotte World II will house a hotel, department store, entertainment complex, and a skyscraper that will be one of the tallest buildings in the world.

Sister cities

Busan shares the title of sister city with several coastal cities or provinces across the world.^[11]

- Kaohsiung, Taiwan (1966)
- Los Angeles, USA (1967)
- Shimonoseki, Japan (1978)
- Barcelona, Spain (1983)
- Rio de Janeiro, Brazil (1985)

See also

- List of Korea-related topics
- List of cities in South Korea
- Centum City
- Pusan International Film Festival
- Gwangan Bridge

External links

- Busan Metropolitan Government ⓘ
- Port of Busan ⓘ
- Tourist information ⓘ
- Galjŏm wiki page on Busan ⓘ
- Hotel info ⓘ
- Lotte Giants baseball team ⓘ
- Pusan International Film Festival ⓘ
- Pusan National University ⓘ

Wikimedia Commons has media related to Busan.

Busan [show]

Regions and administrative divisions of South Korea [hide]

Categories: All articles with unsourced statements | Articles with unsourced statements since August 2007 | Busan | Cities in South Korea | Coastal cities

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Busan Metropolitan City

A view of the Guseong district in Busan

Korean name
Hangul: 부산광역시
Hanja: 釜山廣域市
Revised Romanization
Busan Gwanggyeoksi
McCune-Reischauer: Pusan Kwanggyeoksi
Short name
Hangul: 부산
Hanja: 釜山
Revised Romanization: Busan
McCune-Reischauer: Pusan
Statistics
Area: 763.46 km² (295 sq mi)
Population (2006): 3,636,389 (1)
Population density: 4,762/km² (12,334/sq mi)
Government: Metropolitan City
Mayer: Han Han-mik
Administrative divisions: 15 wards (Gu), 1 county (Gun)
Region: Yeongnam
Dialect: Gyeongseong
Location map



JagalchiMarket

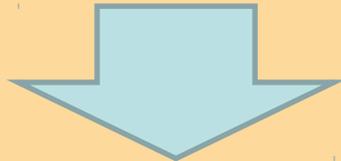
Infobox Templates

```

{{Infobox Korean settlement
| title           = Busan Metropolitan City
| img             = Busan.jpg
| imgcaption     = A view of the [[Geumjeong]] district in Busan
| hangul         = 부산 광역시
| . . .
| area_km2       = 763.46
| pop            = 3635389
| popyear        = 2006
| mayor          = Hur Nam-sik
| divs           = 15 wards (Gu), 1 county (Gun)
| region         = [[Yeongnam]]
| dialect        = [[Gyeongsang]]
}}

```

Wikitext-Syntax



RDF representation

```

dbp:Busan      dbp:title      "Busan Metropolitan City"
dbp:Busan      dbp:hangul     "부산 광역시" @Hang
dbp:Busan      dbp:area_km2  "763.46"^^xsd:float
dbp:Busan      dbp:pop       "3635389"^^xsd:int
dbp:Busan      dbp:region    dbp:Yeongnam
dbp:Busan      dbp:dialect   dbp:Gyeongsang
. . .

```

Busan Metropolitan City



A view of the [Geumjeong](#) district in Busan

Korean name

Hangul	부산 광역시
Hanja	釜山廣域市
Revised Romanization	Busan Gwangyeoksi
McCune-Reischauer	Pusan Kwangyŏkshi

Short name

Hangul	부산
Hanja	釜山
Revised Romanization	Busan
McCune-Reischauer	Pusan

Statistics

Area	763.46 km ² (295 sq mi)
Population (2006)	3,635,389 ^[1]
Population density	4,762/km ² (12,334/sq mi)
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Mayor	Hur Nam-sik
Administrative divisions	15 wards (Gu), 1 county (Gun)
Region	Yeongnam
Dialect	Gyeongsang

Datenset

- Extraktion in **92 Sprachen**
- DBpedia enthält ca. **3,4 Millionen Dinge**, mehr als 312,000 Personen, mehr als 413,000 Orte,...
- **ca. 300 Millionen RDF Tripel**
- Redirects ermöglichen das einfache Erstellen von **Synonymlisten**
- Links zwischen verschiedenen Sprachversionen ermöglichen **Übersetzung von Begriffen**

Dataset (En only)	Triples
Titles	3.4M
Abstracts	3.2M
External Links	5.5M
Categories	0.5M
Infoboxes (generic)	26.0M
Infoboxes (mapped)	7.0M
Yago Classes	75K
Geo-coordinates	1.5M
Properties	66k
Mapping to Flickr, DBLP, Eurostat, CIA-Factbook, Musicbrainz, Project Gutenberg, US Census, ...	2.5M
Mapping to OpenCyc	45k

Kollaborative Ontologieerstellung

- **“A little Semantics goes a long way”** - Jim Hendler

Kollaborative Ontologieerstellung

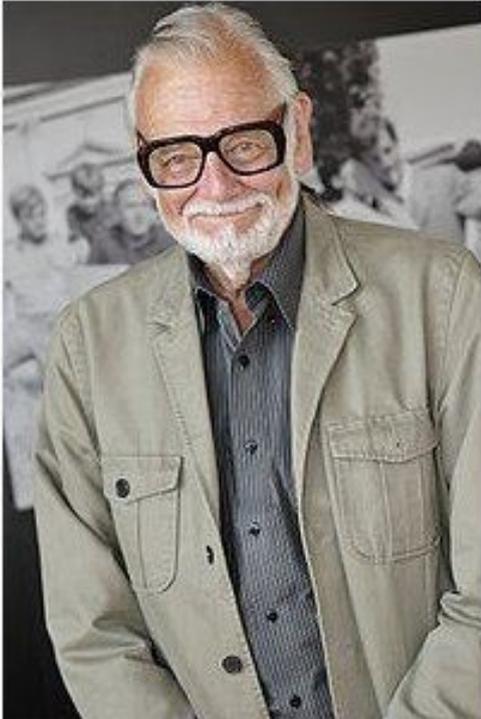
- **“A little Semantics goes a long way”** - Jim Hendler
 - Expressive Abfragen können bereits mit der direkten Konvertierung beantwortet werden
 - <http://tinyurl.com/2uhuow9>

Kollaborative Ontologieerstellung

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 - Expressive Abfragen können bereits mit der direkten Konvertierung beantwortet werden
 - <http://tinyurl.com/2uhuow9>
- **More Semantics go a longer way...**
 - Kollaboratives Mapping und Schema erhöhen die Datenqualität
 - Mehr Treffer bei Abfragen

A closer look at infoboxes

George A. Romero



Romero in Venice, 2009

Born George Andrew Romero
February 4, 1940 (age 69)
New York, NY, U.S.

Occupation film director
screenwriter
editor
actor

Spouse(s) Christine Forrest (1981-present)

Björk



Bjork performance at Rock en Seine, Paris 2007

Background information

Birth name Björk Guðmundsdóttir

Born 21 November 1965
(age 43)
Reykjavík, Iceland

Genres Electronica, alternative rock, trip hop, IDM

Occupations Musician, songwriter, producer, actress,

The Right Honourable Gordon Brown MP



Prime Minister of the United Kingdom

Incumbent

Assumed office

27 June 2007

Monarch Elizabeth II

Preceded by Tony Blair

Chancellor of the Exchequer

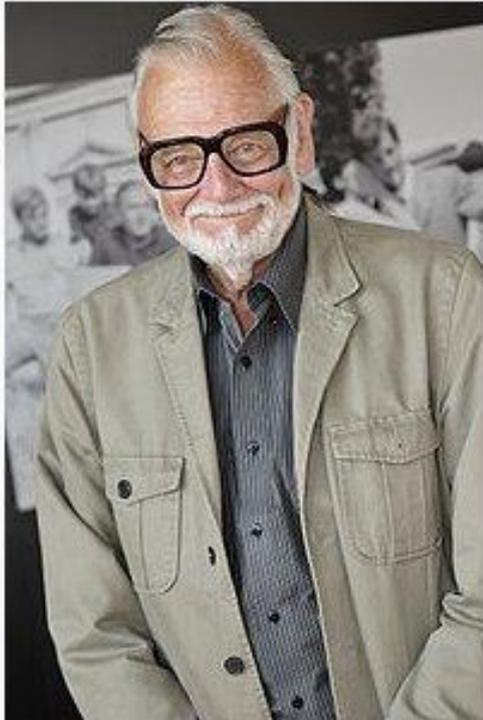
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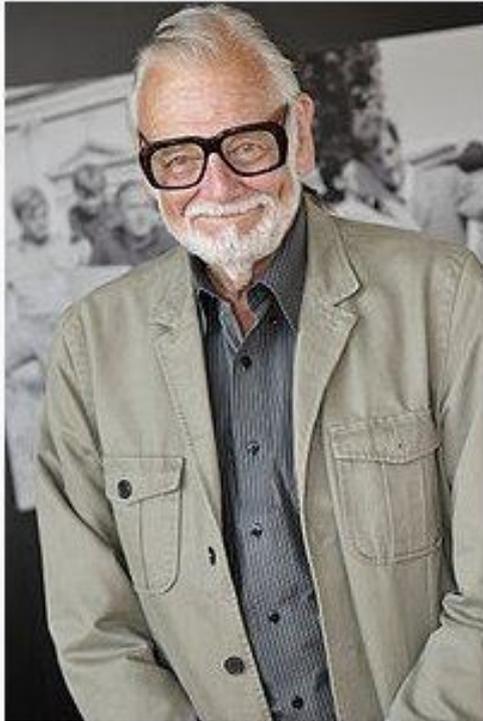
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```

{{Infobox musical artist
| Name           = Björk
| Img          = Björk Rock en Seine 2007 (2).jpg
| Img_capt     = Björk performance at Rock en Seine
| Img_size     =
| Landscape     =
| Background    = solo_singer
| Birth_name   = Björk Guðmundsdóttir
| Alias        =
| Born ←      = {{birth date and age|df=yes|1965|12|21}}
| Died        =
| Origin      =
| Instrument  = [[Singer|Vocals]], [[Keyboard instrument|Keyboard instrument]], [[harp]]
| Voice_type  = [[Soprano]]<ref>http://www.spirit.com/artist/bjork.html</ref>
| Genre       = [[Electronical]], [[alternative rock]]
| Occupation  = [[Musician]], [[songwriter]], [[record producer|producer]], [[actor|actress]], [[fashion model]]
| Years_active = 1977–present
| Label       = [[One Little Indian]], [[Elektra Records|Elektra]], [[Atlantic Records Group|Atlantic]], [[Polydor Records|Polydor]], [[Mother Re
| [[Smekkleysa]]
| Associated_acts = [[The Sugarcubes]], [[Thom Yorke]], [[Tappi Tíkarrass]], [[KUKL (group)|KUKL]]
| URL         = [http://www.bjork.com/ www.bjork.com]
}}

```

Björk (Musician)

Occupation = Musician, Actor

Born = 21.12.1965, Reykjavík

```

{{Infobox Prime Minister
| honorific-prefix = <small>
| name             = Gordon B
| honorific-suffix = <br /><
| image            = Gordon B
| imagesize        = 200px
| alt              = Gordon B
| office ←        = [[Prime
| monarch          = [[Elizab
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| term_end         =
| predecessor      = [[Tony Blair]]
| successor        =
| office2           = [[Chancellor of the Exchequer]]
| term_start2      = 2 May 1997
| term_end2        = 27 June 2007
| primeminister2   = [[Tony Blair]]
| predecessor2     = [[Kenneth Clarke]]
| successor2       = [[Alistair Darling]]

```

Brown (Prime Minister)

office = Prime Minister of the UK

birth_date = 20.4.1951

birth_place = Govan

```

{{Infobox actor
| image = George Romero, 66
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| birthplace = ← [[New York,
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Richtige Semantik

- Zusammenführen, was zusammen gehört
 - `birth_place`, `placeOfBirth` => `birthPlace`
- Trennen, was nicht zusammen gehört
 - `born` => `birthPlace`, `birthDate`
- Korrektes Klassifikationsschema
 - Wikipedia Kategorien enthalten Zyklen und werden wie Tags verwendet, nicht wie OWL Klassen

Mapping und DBpedia Ontology

- <http://mappings.dbpedia.org>
 - Termnormalisierung
 - Mapping
 - Ontologieschema

werden in einem kollaborativen Wikiprozess gepflegt.

Live Extraktion

- Daten werden live mit Wikipedia synchronisiert
- über 100.000 updates pro Tag
- <http://dbpedia-live.openlinksw.com/sparql>
- Erlaubt das indirekte Editieren von RDF Daten durch Wikipedia
- Gute Datenqualität in Kombination mit kollaborativer Mapping- und Ontologieerstellung
 - => hochaktuelle Daten
 - => richtige Semantik

Verwendung

- Download auf <http://dbpedia.org>
- Verfügbar über einen öffentlichen Webservice (OpenLink):
 - SPARQL <http://dbpedia.org/sparql>
 - Live <http://dbpedia-live.openlinksw.com/sparql>
 - Linked Data
- Lizenziert als CC-BY-SA (wie Wikipedia)



Vorteile

- Qualitativ hochwertiger Datensatz (durch das Mapping)
- Informationen sind hochaktuell
- leichte programmatische Wiederverwendung
- einfaches erstellen von Mash-Ups durch den Web Service und LinkedData
- Freie Lizenz – bereits hunderte von Applikationen
 - BBC
 - New York Times
 - <http://wiki.dbpedia.org/Applications>

Vorteile

- Daten sind Ready-to-Use
- Beispiele:
 - Städte-Katalog
 - Daten über führende Politiker der Welt
 - Concept Tagging