



คณะภูมิสารสนเทศศาสตร์
Faculty of Geoinformatics Burapha University

Natural language processing (NLP)

Crash Course

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Outline

- Week 1 : Basic Python & Numpy
- Week 2 : Pandas & Matplotlib (Exploratory Data Analysis)
- Week 3 : API & Sentiment Analysis
(Logistic Regression & Naïve Bayes)
- Week 4 : Sentiment Analysis (Word Embedding, Recurrent Neural Network & Long-Short Term Memory)

What is NLP

- **Wiki:** Natural language processing (NLP) is a field of computer science, artificial intelligence, and computational linguistics concerned with the interactions between computers and human (**natural**) languages.





- Identify the structure and meaning of words, sentences, texts and conversations
- Deep understanding of broad language
- NLP is all around us



Machine translation

Google

buenas noches

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About 20,800,000 results (0.54 seconds)

Spanish ▾

buenas noches Edit

English ▾

Goodnight

3 more translations

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www.ynet.co.il

השותפות הקואליציוניות הצליחו להטיל מורא על ראש הממשלה, שכבר אינו מתחייב להביא להצבעה היום את מסקנות ד"ר טרכטנברג. ש"ס לפי שעה מתנגדת. ישראל ביתנו ומפלגת העצמאות יקיימו בבוקר ישיבת שרים וחליטו רק בה - המערכת הפוליטית, חדשות

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עמי וקב"ר או שדורח יעבור או שביבי יעבור
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Dalya Gumis שפסיקו להצבעה ויתחילו לבצע
Yesterday at 08:11 · Like · Translate



Yuval Gilor נמאס כבר לך הביתה
Yesterday at 08:49 · Like · Translate



Haaretz הארץ
Maybe this time he succeeds? [?]



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שוקי זקס With full pay the price for hzhlioth vakombinot of the Prime Minister. Not find it appropriate to action hbrat the health system. Endangered animals, people and caused the suffering that must drive with ... city. Foundation of Minneapolis had already thrown him. Europe also. This man destroys the country with the citizens in its path.

Content: you Binyamin Netanyahu. Netanyahu was not committed to voting the Trachtenberg managed to impose a "partnership hkoalicioniot terror the Prime Minister, who is pledging to bring voting day the conclusions report Trachtenberg. Israel Beiteinu-independence morning ministerial session will vihalito only it-political system, news

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עמי וקב"ר Or acknowledging the report moves or the chips will go
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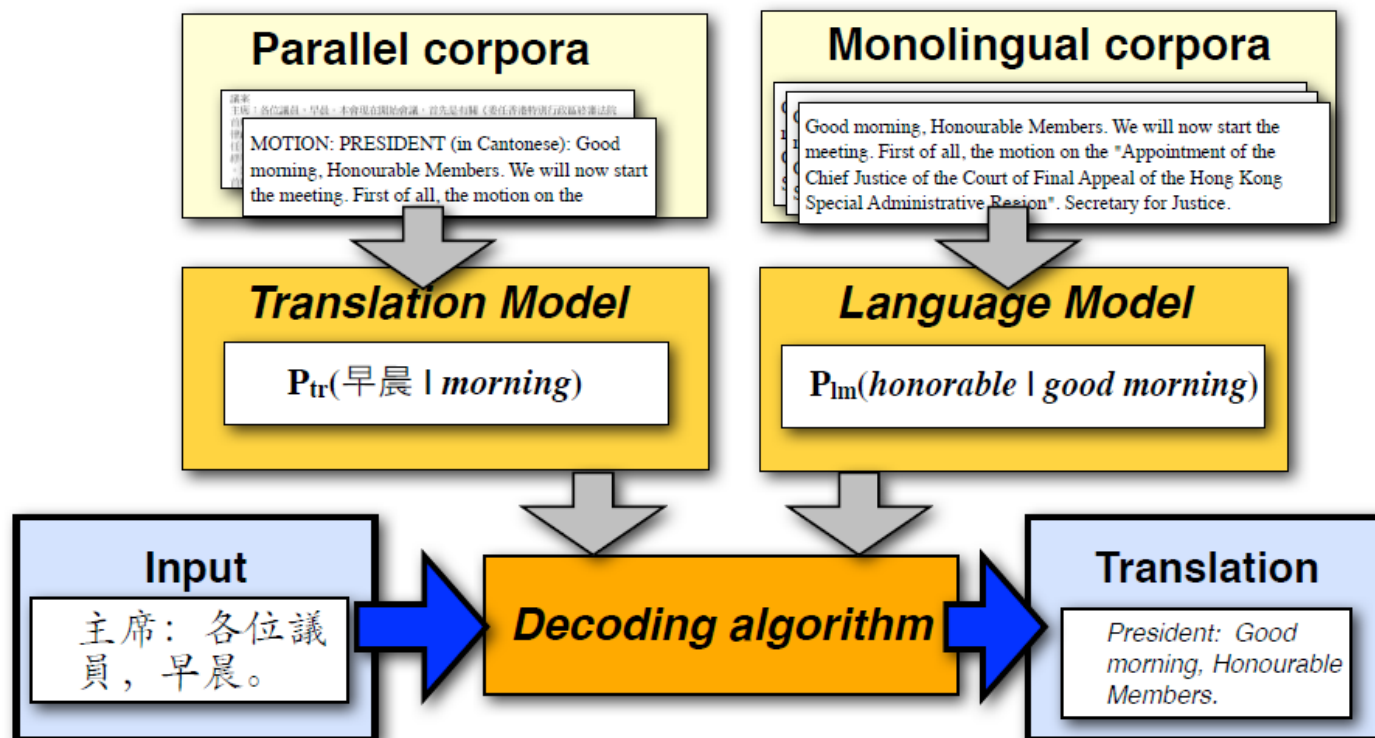
Dalya Gumis Stop vote once to
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Yuval Gilor Tired already go home
Yesterday at 08:49 · Like · Original

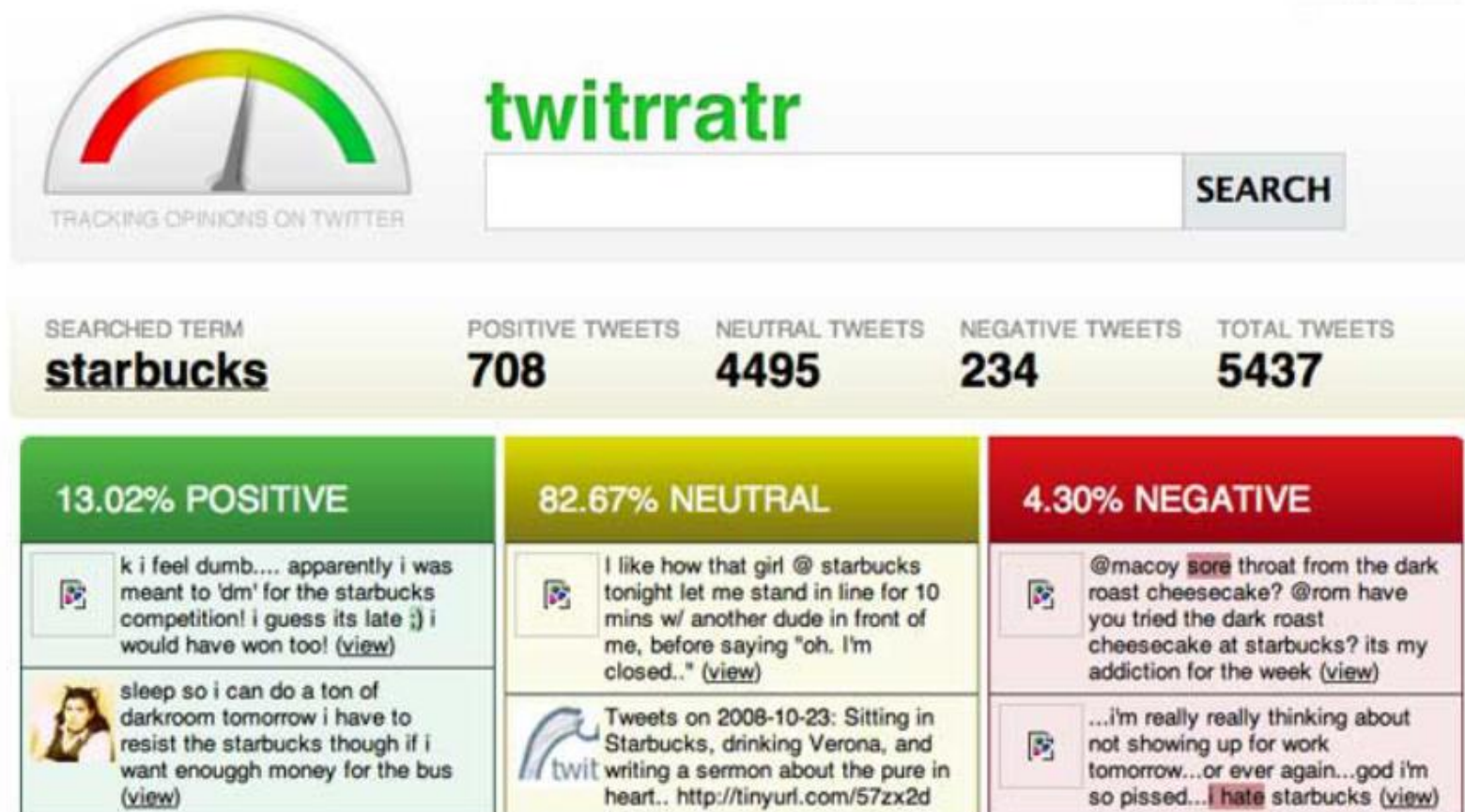
Facebook translation, image credit: Meedan.org

Statistical machine translation





Sentiment/Opinion Analysis





Text Classification



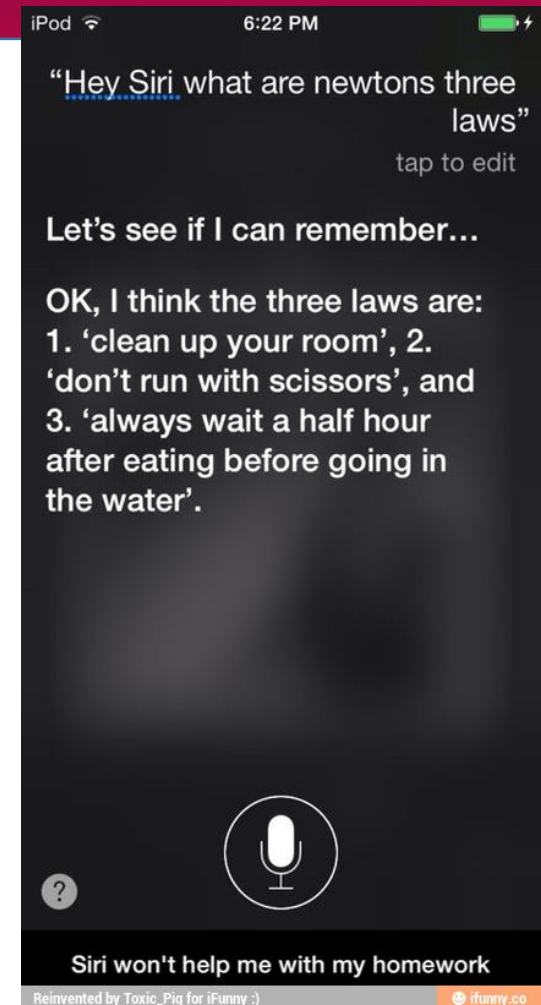
Primary	Social 1 new Google+	Promotions 2 new Google Offers, Zagat	Updates 1 new Google Play	+
<input type="checkbox"/> ☆ James, me (2)	Hiking Hiking trip on Saturday - Yay - so glad you can join. We should leave from I			3:14 pm
<input type="checkbox"/> ☆ Hannah Cho	Thank you - Keri - so good that you and Steve were able to come over. Thank you :			3:05 pm
<input type="checkbox"/> ☆ Jay Birdson	School Upcoming school conference dates. Hello everyone. A few people have			3:05 pm



Question answering



'Watson' computer wins at 'Jeopardy'



credit: ifunny.com



Question answering


- Go beyond search

What's the capital of Wyoming?

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About 984,000 results (0.54 seconds)

Wyoming / Capital



Cheyenne

Map data ©2015 Google

The image shows a Google search result for the question "What's the capital of Wyoming?". The search bar at the top contains the question. Below the search bar, there are tabs for "Web", "Maps", "Shopping", "Images", "News", and "More", along with a "Search tools" link. The "Web" tab is selected. Below the tabs, it says "About 984,000 results (0.54 seconds)". The main result is titled "Wyoming / Capital" and features a street view image of a city street and a map of Wyoming with Cheyenne highlighted. The word "Cheyenne" is written below the images. The map data is credited to ©2015 Google.



Information Extraction

New York Times Co. named Russell T. Lewis, 45, president and general manager of its flagship New York Times newspaper, responsible for all business-side activities. He was executive vice president and deputy general manager. He succeeds Lance R. Primis, who in September was named president and chief operating officer of the parent.

Person	Company	Post	State
Russell T. Lewis	New York Times newspaper	president and general manager	start
Russell T. Lewis	New York Times newspaper	executive vice president	end
Lance R. Primis	New York Times Co.	president and CEO	start



Language Comprehension

Christopher Robin is alive and well. **He** is the same person that you read about in the book, **Winnie the Pooh**. As a **boy**, **Chris** lived in a pretty home called **Cotchfield Farm**. When **Chris** was three years old, **his father** wrote a poem about **him**. The poem was printed in a magazine for others to read. **Mr. Robin** then wrote a book

- Q: who wrote Winnie the Pooh?
- Q: where is Chris lived?