

LANGUAGE TECHNOLOGY IN EUROPE FUNCTION, CHALLENGES AND STATE OF DEVELOPMENT

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Language

- Most knowledge of humankind is stored and passed on in texts.
- Language is the most powerful and natural medium of communication, we have.



Variety

- there are more than 6000 active languages in the world, more than 2000 are written.
- languages disappear at a fast rate
- only a few hundred may survive



Europe has more than 60 languages with numerous dialects and a fast growing number of immigrant languages



Europe needs multilingual LT

- to preserve cultural heritage in its diversity
- to give equal opportunities to all citizens of the European Union
- to make the Digital Single Market work
- to benefit economically and in daily life from the immense progress in AI and language processing



META-NET is a Network of Excellence
Technologies for Multilingual Europe with
60 research centers in 34 countries



META-NET forges the Multilingual Europe
Technology Alliance,
which has 725 Members in 60 countries



META-NET has published 31 White
Papers each describing the state of one
European Language in the Digital World



META-NET issued the Strategic Research
Agenda “Technologies for Multilingual
Europe 2020”



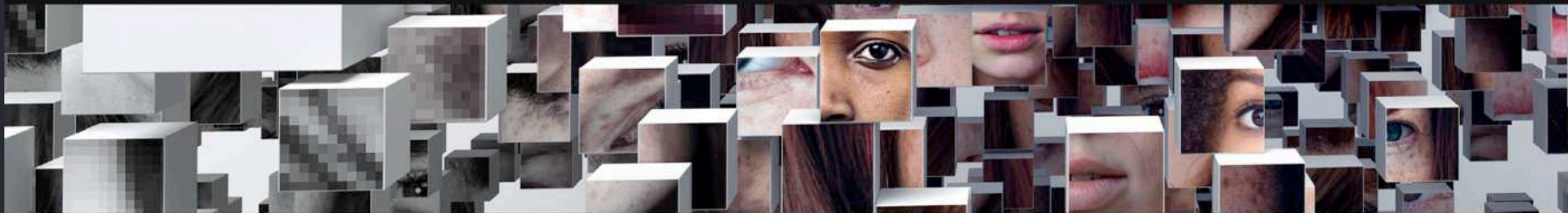
Enter your forecasts for a chance
to win prizes totaling **\$1.2 million**.

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Robotics

Google's New Service Translates Languages Almost as Well as Humans Can

A jump in the fluency of Google's language software will help efforts to make chatbots less lame.



By Roger Parloff

Illustration by Justin Metz

SEPTEMBER 28, 2016, 5:00 PM EST

WHY DEEP LEARNING IS SUDDENLY CHANGING YOUR LIFE

Decades-old discoveries are now electrifying the computing industry and will soon transform corporate America.



TECH ENTERPRISE

IBM To Hold \$5 Million Watson Artificial Intelligence Contest

by Jonathan Vanian

@JonathanVanian

FEBRUARY 17, 2016, 2:42 PM EST



The
Economist

JANUARY 17th-23rd 2017

**Now we're
talking**



Turkey torn apart

Theresa Maybe, Britain's indecisive PM

Nestlé goes on a health kick

Meet China's Shakespeare

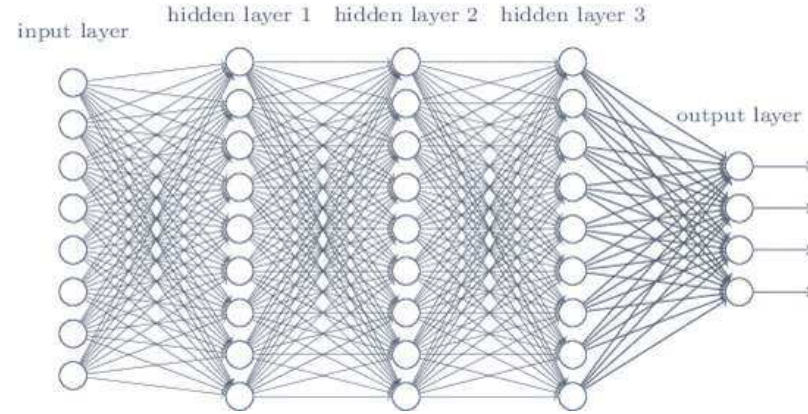
**Voice computing
comes of age**

Why now?

Considerable progress in

- Knowledge technologies
- Machine learning
- Big Data
- Internet technology
- Hardware

Deep neural network





Superhuman Performance?

Superhuman Performance

- DeepBlue
- IBM Watson
- AlphaGo
- Googles Driverless Cars



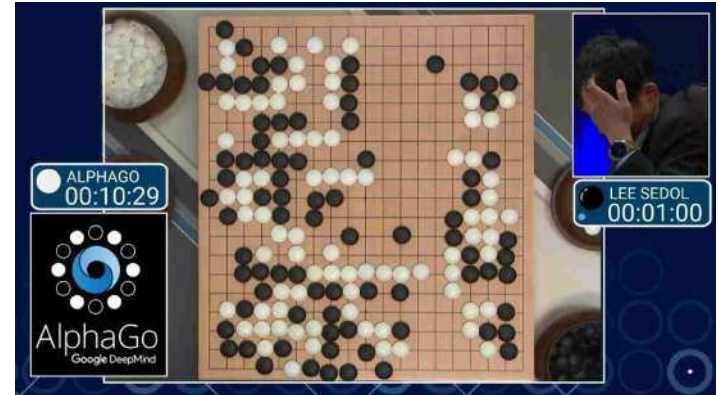
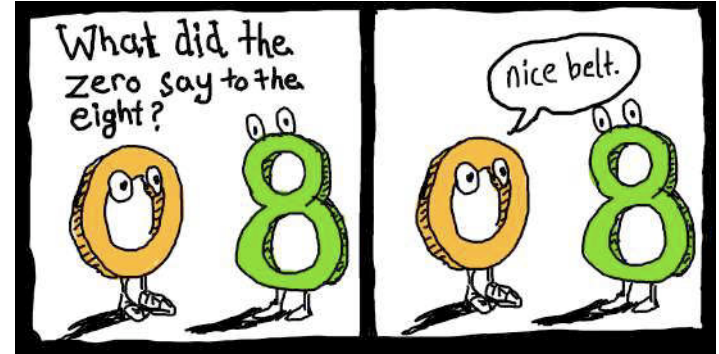
Paradoxon

- AI cannot simulate a four year old child.
- The computer WATSON of IBM Watson Research Center beat the best human quiz champions in the US TV quiz show Jeopardy



Paradoxon

- AI cannot understand the simplest Joke.
- But AI can now also beat the world champion in Go



Yes, there is Superhuman Performance

- Better than most or average people:

MT, chess, go, jeopardy, driving, face recognition

- Better than most or all of the masters/pros:

chess, go, jeopardy

AI can do what humans cannot do!

AI extends human cognition

Perception: Interpreted sensor input for vision, hearing, feeling

Observing our world: Monitoring data, web

Knowledge: Immediate Access to all knowledge in the world

Understanding: Analysing millions of data in real-time

Learning from Experience: Machine Learning

Intelligent Action: Robotics, automated processes



How Superhuman is Today's AI?

- statistical learning of behavior - yes
- reusable knowledge – yes
- inference capabilities - some
- knowledge acquisition - some
- intentions and planning - some
- self-consciousness - no
- Systems with analogy reasoning - no
- Systems with sentiment/emotions - no
- Systems with creativity - no

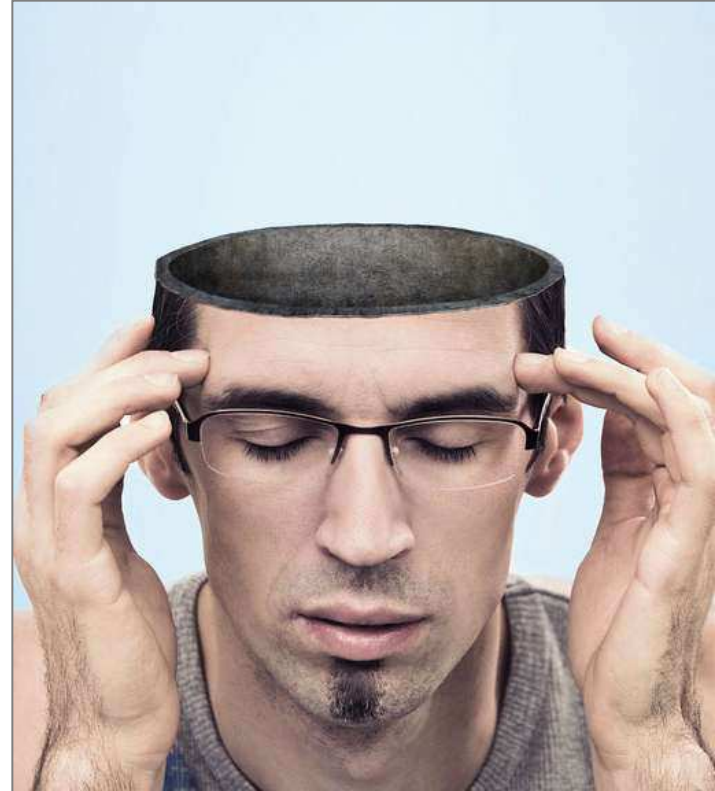


The difference

- For solving intellectually challenging problems, people need understanding and often creativity
- AlphaGo, face recognition and autonomous driving programs do not work by understanding

In machine-learned behavior: No reusable knowledge

- Actually, no knowledge at all
- Difference between a reactive system and a knowledge system
- No facts and no explanation
- No grounding



Natural language interfaces and talking robots

- Siri, Alexa, Google Home and many others



Assistants need to understand their masters

future technology will need to “understand” people

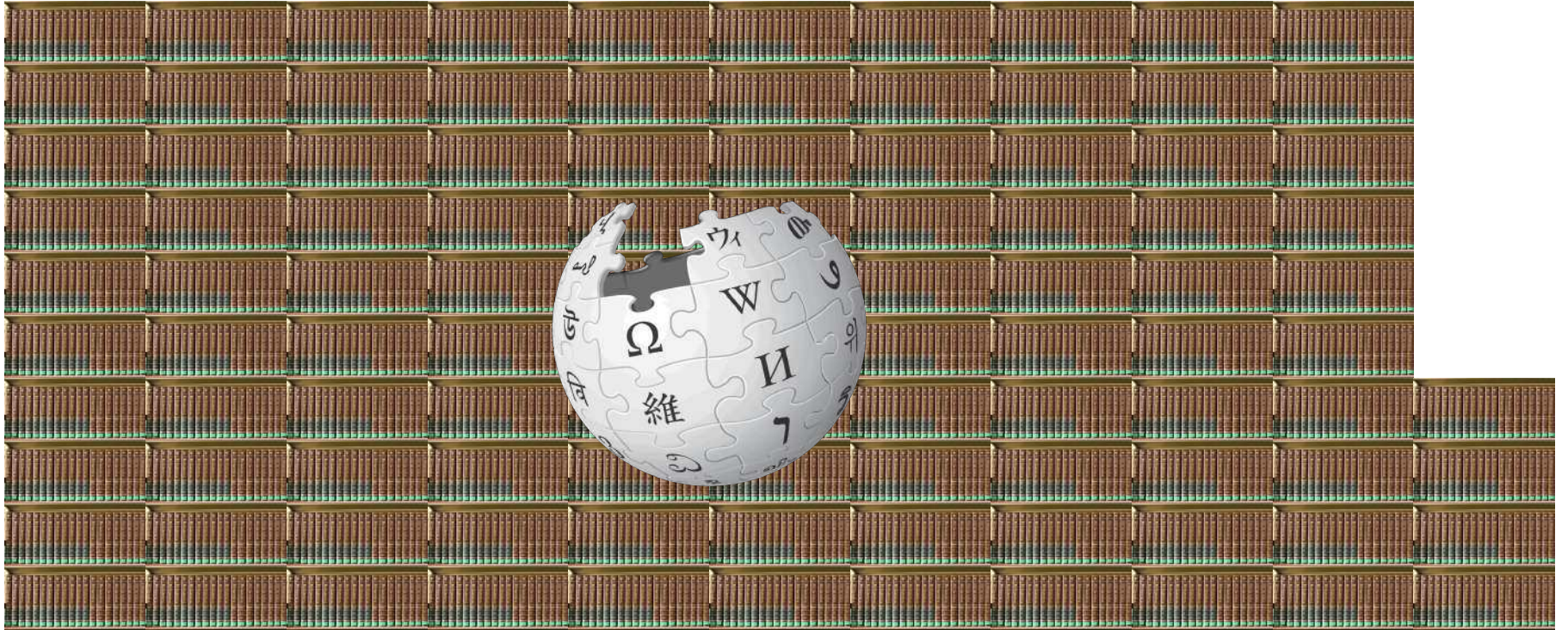
- autonomous driving systems
- service robots
- personal assistants





Classical knowledge





Mona Lisa

Da Vinci

Date of birth: April 15, 1452
Date of death: May 2, 1519
(age 67 years)

Michelangelo

Italy

Web Bilder Videos Bücher Maps Mehr ▾ Suchoptionen

Ungefähr 9.220.000 Ergebnisse (0,35 Sekunden)

Leonardo da Vinci – Wikipedia

de.wikipedia.org/wiki/Leonardo_da_Vinci ▾

Leonardo da Vinci [leoˈnardo da ˈvintʃi] (* 15. April 1452 in Anchiano bei Vinci; † 2. Mai 1519 auf Schloss Clos Lucé, Amboise; eigentlich Leonardo di ser ...

Liste der Gemälde von ...

Liste der Gemälde von Leonardo da Vinci, aus Wikipedia, der ...

Vitruvianischer Mensch

Als vitruvianischer Mensch (lat. homo vitruvianus, auch ...

Weitere Ergebnisse von wikipedia.org »

Leonardo da Vinci - Wikipedia, the free encyclopedia

en.wikipedia.org/wiki/Leonardo_da_Vinci ▾ Diese Seite übersetzen

Leonardo di ser Piero da Vinci was an Italian Renaissance polymath: painter, sculptor, architect, musician, mathematician, engineer, inventor, anatomist, ...

leonardo-da-vinci

www.leonardo-da-vinci.de/ ▾

Leonardo da Vinci.de: Leben und Werk.

leonardo da vinci, zeittafel, biografie

www.leonardo-da-vinci.de/zeittafel.htm ▾

Lebensdaten, Ereignisse: 15.04.1452, **Leonardo** (auch Lionardo) da Vinci wird in einem kleinen Haus in der Nähe des Dorfes Vinci (bei Empoli) als unehelicher ...

Planet Wissen - Leonardo da Vinci

www.planet-wissen.de › Natur & Technik › Erfindungen › Erfinder ▾

Er war Maler, Bildhauer, Architekt, Musiker, Mechaniker, Ingenieur, Philosoph und Naturwissenschaftler: **Leonardo da Vinci** (1452 bis 1519).

Die Leonardo Da Vinci Ausstellung « Exploring Arts & Science

www.davinciausstellung.de/ ▾

Leonardo da Vinci (1452-1519). Leonardo war sicherlich einer der ersten modernen Menschen der Renaissance. Er verzahnte die unterschiedlichsten ...

Leonardo da Vinci - Biography - Writer, Mathematician ...

www.biography.com/.../leonardo-da-vinci-40396 ▾ Diese Seite übersetzen

A leading figure of the Italian Renaissance, **Leonardo da Vinci's** work has epitomized beauty for generations. Read more about the artist at Biography.com.



Mehr Bilder

Leonardo da Vinci

Maler

Leonardo da Vinci war ein italienischer Maler, Bildhauer, Architekt, Anatom, Mechaniker, Ingenieur und Naturphilosoph. Er gilt als einer der berühmtesten Universalgelehrten aller Zeiten. [Wikipedia](#)

Geboren: 15. April 1452, Vinci, Italien

Gestorben: 2. Mai 1519, Amboise, Frankreich

Epoche: Hochrenaissance

Beerdigt: Hubertus-Kapelle, Frankreich

Eltern: Piero da Vinci, Caterina da Vinci

Aktuelle Informationen zu **Leonardo da Vinci** erhalten

Info erhalten

Werke

Über 25 weitere ansehen



Mona Lisa
1517



Das Abendmahl
1498



Felsgrötte...
1486



Ginevra de' Benci
1498



Vitruviani...
Mensch
1490

Wird auch oft gesucht

Über 15 weitere ansehen



Michelan...



Raffael



Pablo
Picasso



Vincent van
Gogh



Donatello

Repositories of Structured Knowledge (Volume)

- 10 M entities - 120 M facts
- 4.58 M entities
- 45 M topics - 2,664,607,536 facts
- 13,040,701 data items
- 1.6 B facts



Google Knowledge Vault

Projected sales of main products in 2013



Distribution of market share among the major industry players



Distribution of market share among the major industry players: 29%, 25%, and 46%. Further changes in the market will be characterized by a more equal distribution of market share among players.

Share of market activity



Changes in the activity of the active and passive market is uncertain. Established positive trends in various market segments.

Passive market share



Projected sales of main products in 2013



Human Language Medium

- ...will become the predominant medium for the interaction...
- ...between people and technology
- ...between people and the collective knowledge and information of the entire world
- ...and thus also to a certain degree between people and everything



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This translates into business

“everything”
includes
e-commerce

all its products
and services



*good support through
Language Technology*

*weak or
no support*



Recommendation

- build an LT support that is similar to the one for group 2 languages
- if this is paid for by public money, make it free to public and commercial use
- support a coalition between research and industry that promotes the LT support by attractive sample products or services

Components of the Basic Structure (idea of BLARK)

- Data, data and data
 - corpora
 - speech data in use situations
 - language models (word embeddings)
- Basic processing components
 - speech recognition and speech synthesis
 - basic POS taggers and dependency parsers
 - dictionaries, hyphenation, morphology, grammars
 - language checker
 - named entity recognition for places, persons, companies

THANK YOU FOR YOUR INTEREST!

