

# PLEASE DON'T AGREE: INTRODUCING DESCARTES-CORE

IAOA SEMANTIC WEB AND APPLIED ONTOLOGY SIG  
NOVEMBER, 2013

Krzysztof Janowicz

STKO Lab, University of California, Santa Barbara

Pascal Hitzler

DaSe Lab, Wright State University

Rene Descartes (1637): *'[As] for logic, its syllogisms and the majority of its other precepts are of avail- rather in the communication of what we already know,[...] than in the investigation of the unknown;'*

## THE $7 \pm 2$ KEY INSIGHTS LEADING TO DESCARTES-CORE

- The successful standardization of protocols made us believe that we should also **standardize meaning** on the Web. This is a fundamental **misconception**.
- The purpose of Semantic Technologies is to **make meaning explicit**, not to agree on what things/terms mean.
- Yes, volume and velocity are important but the key **value proposition** of the Semantic Web is to foster **publishing, retrieving, reusing data** in the presence of **variety**.
- The Web is heterogeneous. Please **feel free to disagree** on what terms mean, allow for contradictions and different perspectives, use the (knowledge representation) language that works best for your purpose, support different scales/granularities,...
- Invest in (ontology) **alignment** and semantic **translation** between different (micro-)ontologies and knowledge representation languages.
- Ontologies **restrict interpretations**, they do not fix meaning.

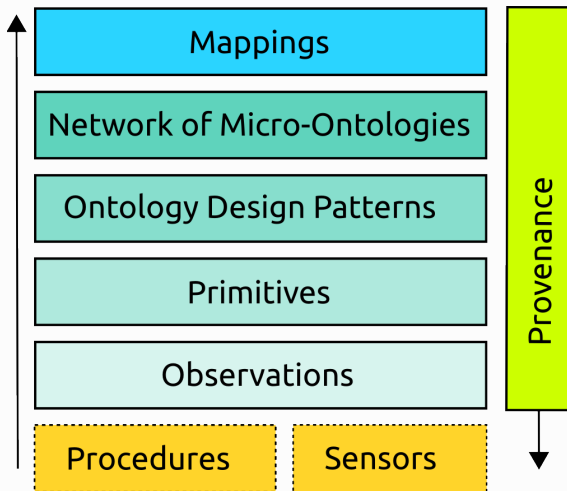
( See also: <http://bit.ly/18hSOH4> )

## A FIRST DESCARTES-CORE MISSION STATEMENT

*'Similar to Dublin Core for the library science and Darwin Core for ecology, we plan to establish Descartes-Core. Descartes-Core will not be a top-level ontology but a set of (geo-)ontology design patterns, micro-ontologies, best practice guides, examples, software, and services, that aim to foster semantic interoperability between different (Linked Data) sources without restricting semantic heterogeneity at the same time.'* (<http://vocamp.org/wiki/GeoVoCampSB2013>)

- ⇒ Bring what made the Web and Linked Data successful to (geo-)ontology engineering: **massive participation** and a clear **value proposition** that appeals to the individual.
- ⇒ Descartes-Core should lower the **initial entry hurdle** to make your data available, retrievable, and reusable.
- ⇒ In the Big Data age **synthesis is the new analysis**.

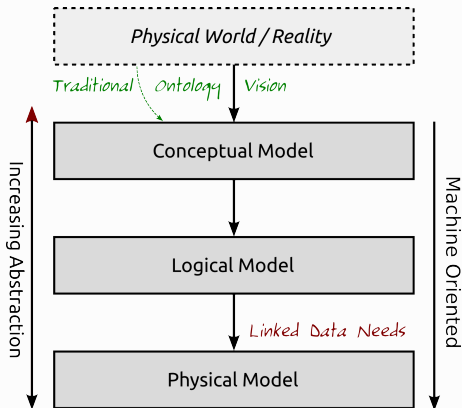
# DESCARTES-CORE ONTOLOGY ENGINEERING STACK



( See: <http://bit.ly/19y5dk0> )

# WHEN WORLDS COLLIDE

## The ANSI Model Layers



- *'Can there be rivers that do not carry water? Are waves events or objects?'*

**vs.**

- *'Rivers have a flow velocity. Given certain measurement procedures this can be observed at a sampling point. Velocity is of type xsd:float'*
- **Ontologies vs. Vocabularies?**

( See: <http://bit.ly/HYL40t> )

# DO WE NEED ONTOLOGIES AT ALL?

About 796,000 results (0.31 seconds)

## about 2288 years (BC 276)

Eratosthenes, age

[Hide details](#)

[Eratosthenes - Biography of ...](#) - about.com  
Eratosthenes was born around **276 B.C.E.** at a Greek ...

[Eratosthenes](#) - windows2universe.org  
Eratosthenes was born in **276 B.C.** ...

Is this accurate? Yes - No

### [Eratosthenes](#) - Wikipedia, the free encyclopedia

[en.wikipedia.org/wiki/Eratosthenes](http://en.wikipedia.org/wiki/Eratosthenes)

For the ancient Athenian statesman of the fifth century BC, see **Eratosthenes** .... 285 BC) since he is unlikely to have studied under him at the young **age** of 14.


↳ Sieve of Eratosthenes - Eratosthenes (crater) - Eratosthenes Seamount

### [Eratosthenes](#) - Biography of Eratosthenes

[geography.about.com/od/historyofgeography/a/eratosthenes.htm](http://geography.about.com/od/historyofgeography/a/eratosthenes.htm)

**Eratosthenes** was born around **276 B.C.E.** at a Greek colony in Cyrene, Libya. ... In old **age**, **Eratosthenes** became blind and died of self-induced starvation in ...

## Eratosthenes




[en.wikipedia.org](http://en.wikipedia.org)

**Born:** BC 276, Cyrene


**Died:** BC 194, Alexandria

**Parents:** Aglaüs


### People also search for




Ptolemy




Aristarc...



Archimedes



Euclid




Hipparchus

[Report a problem](#)

A query to Google's Knowledge Graph in 2012.

# A LITTLE SEMANTICS GOES A LONG WAY...



[Web](#) [Images](#) [Maps](#) [Shopping](#) [More ▾](#) [Search tools](#)

About 2,160,000 results (0.19 seconds)

## 82 (276 BC–194 BC)

Eratosthenes, Age at death

[Feedback](#) / [More info](#)

**Eratosthenes** - Biography of **Eratosthenes** - Geography - About.com  
geography.about.com › Education › Geography › History of Geography ▾  
In old **age**, **Eratosthenes** became blind and died of self-induced starvation in either 192 or 196 B.C.E. He had thus lived to be about 80 to 84 years old.

**Eratosthenes** - Wikipedia, the free encyclopedia  
en.wikipedia.org/wiki/**Eratosthenes** ▾  
For the ancient Athenian statesman of the fifth century BC, see **Eratosthenes** .... 285 BC) since he is unlikely to have studied under him at the young **age** of 14.  
Sieve of Eratosthenes - Eratosthenes (crater) - History of geodesy

**Eratosthenes** - Simple English Wikipedia, the free encyclopedia  
simple.wikipedia.org/wiki/**Eratosthenes** ▾  
**Eratosthenes** was a friend of Archimedes, who also lived and worked in Alexandria. Archimedes was the greatest mathematician and inventor of the **age**, ...


## Eratosthenes

Mathematician


Eratosthenes of Cyrene was a Greek mathematician, geographer, poet, astronomer, and music theorist. He was the first person to use the word "geography" in Greek and he invented the discipline of geography as we understand it. [Wikipedia](#)

**Born:** 276 BC, Cyrene, Shahhat, Libya  
**Died:** 194 BC, Alexandria, Egypt  
**Education:** Platonic Academy  
**Parents:** Aglaüs


People also search for




Ptolemy




Hipparchus



Aristarchus of Samos



Strabo



Archimedes

The same query one year later (2013).

■ **Semantic Rule:** *stop counting years once a person dies.*

(Try that in OWL ;-))

# HOW TO MASSIVELY CREATE/MINE ONTOLOGIES?

Google

Eiffel Tower

Web Images Maps Shopping News More Search tools

About 65,000,000 results (0.24 seconds)

**The Eiffel Tower** : official website of the most famous monument of ...  
[www.tour-eiffel.fr/en.html](http://www.tour-eiffel.fr/en.html) ▼  
What's on at the Tower; Movie/360°; On your mobile; Follow the Eiffel Tower ... The Eiffel Tower launches its official Youtube channel and invites you to discover ...

**Eiffel Tower**  
[www.tour-eiffel.fr/](http://www.tour-eiffel.fr/) - Translate this page  
La tour Eiffel et Google France dévoilent trois expositions numériques immersives inédites mêlant images d'archives exclusives et vues panoramiques Street View.  
4.6 ★★★★★ 3,818 Google reviews - Write a review

Champ de Mars, 5 Avenue Anatole France, 75007 Paris, France  
+33 692 70 12 39

Google

Eiffel Tower age



Web Images Maps Shopping More Search tools

About 4,020,000 results (0.23 seconds)

**Gustave Eiffel** - Wikipedia, the free encyclopedia  
[en.wikipedia.org/wiki/Gustave\\_Eiffel](http://en.wikipedia.org/wiki/Gustave_Eiffel) ▼  
He is best known for the world-famous Eiffel Tower, built for the 1906 Universal Exposition in Paris, France. After his retirement from engineering, Eiffel ...  
Early life - Engineering career - Influence - Works

What is the **age of the Eiffel tower** - WikiAnswers  
[wiki.answers.com/WikiAnswers/Categories/Entertainment\\_Arts](http://wiki.answers.com/WikiAnswers/Categories/Entertainment_Arts) ▼  
The Eiffel Tower once had the record for world's tallest structure but lost the title ...  
The Eiffel Tower is an iron lattice tower located in Paris, France, and is one of ...

How old is the **Eiffel Tower?** - Evi  
[www.evi.com/g/how\\_old\\_is\\_the\\_eiffel\\_tower](http://www.evi.com/g/how_old_is_the_eiffel_tower) ▼  
The Eiffel Tower was constructed on March 31st 1889. That makes its current age 124 years, 7 months and 4 days old. website wikipedia. Report Abuse.



## Eiffel Tower

Observation tower in Paris, France

**Directions**

The Eiffel Tower is an iron lattice tower located on the Champ de Mars in Paris. It was named after the engineer Gustave Eiffel, whose company designed and built the tower. Wikipedia

**Address:** Champ de Mars, 5 Avenue Anatole France, 75007 Paris, France

**Height:** 1,063' (324 m)

**Construction started:** January 28, 1887

**Opened:** March 31, 1889

**Architect:** Stephen Sauvestre

**Engineers:** Maurice Koechlin, Gustave Eiffel, Emile Nouguier

**Reviews**  
4.6 ★★★★★ 3,818 Google reviews

- **Generalized rule:** *Age is the time/duration from a xsd:date to the query time (or a second declared xsd:date value). ???*



# IN A NUTSHELL

- Let's try to make the **user** (domain expert) the knowledge engineer.
- Develop a knowledge/ontology engineering stack that is informed by and optimized for **real data** and **real queries**.
- **Combine** inductive and deductive methods to scale ontology generation.
- **Heterogeneity** is a feature, not a bug.
- Let's **agree to disagree** on the meaning of terms, on the used KR languages, ontological commitments, ...
- Invest the time we freed up to do research on **alignment and translation** technologies.
- Create a **network of micro-ontologies** to generate global synergies while acknowledging the local character of meaning.