

The Life of Carl Friedrich Gauss

Topic: differential-geometry differential-geometers physicists scientists number theory astronomers mathematicians
Time: 18th-century 19th-century
Location: France Europe Germany Braunschweig



Adrien-Marie Legendre: (18 September 1752 - 10 January 1833) was a French mathematician. He made important contributions to statistics, number theory, abstract algebra and mathematical analysis.

1776



1777-04-30: Carl Friedrich Gauss was born on April 30, 1777 in [Braunschweig](#), in the duchy of Braunschweig-Wolfenbüttel,....

1777



1792: Gauss's intellectual abilities attracted the attention of the [Charles William Ferdinand, Duke of Brunswick](#), who sent him to the....

1792

1796-03-30: Carl Gauss obtains conditions for the constructibility by ruler and compass of regular polygons, and is able to announce that the regular 17-gon is co....

1796-03

1796-07-10: Carl Friedrich Gauss discovers that every positive integer is representable as a sum of at most 3 triangular numbers.

1796-07



Bernhard Riemann (September 17, 1826 - July 20, 1866) was an influential German mathematician who made lasting contributions to analysis and differential geometry, some of them....

1826

Contexts

A context is an object with 3 attributes: time, location and topic

- Contexts provide a background for the entity and explain how it interacts with other entities
- Contexts serve as a means for enabling users to focus on one or more aspect of interest
- In CATE, Wikipedia categories are considered *contexts*, and new contexts can be constructed based on attribute values. The attributes are organized in the hierarchies provided by YAGO2.

Assigning Entities to Contexts

- Direct Assignment:** If C is a Wikipedia category and e belongs to C , then assign e to the context C .
- Hyperlink-based Assignment:** If the majority of pages that link to or from e belong to the category C , then assign e to the context C .
- Attribute-based Assignment:** Assign e to new contexts computed by combining the attributes of the contexts to which e is assigned.

Sample contexts to which Gauss is assigned to

German_Physicists (direct assignment)
 Electromagnetism (hyperlink-based assignment)
 18th-Century_Europe (attribute-based assignment)

Information Extraction

- Extract context attributes from Wikipedia categories using patterns

Context	Time	Location	Topic
18th-century_Physicists	18th century		Physics
German_Mathematicians		Germany	Mathematics

- Extract events from Wikipedia articles using a text parser

Snippet	Timestamp	Image
Gauss was born in Braunschweig	30-4-1777	
Gauss studied in the University of Göttingen	[1795-1798]	

Retrieving Related Contexts and Entities

A language model for each entity e_i using the Wikipedia article $D(e_i)$

$$P(e|D(e_i)) = \lambda \frac{lc(e, D(e_i))}{|D(e_i)|} + (1 - \lambda) \frac{lc(e, Col)}{|Col|}$$

where $lc(e, D(e_i))$ is the number of links to e in the article $D(e_i)$, $|D(e_i)|$ is the length of document $D(e_i)$ and Col is the whole collection

Ranking a context C that the entity e belongs to: rank the context based on its probability of generating the entity e

$$P(e|C) = \frac{1}{n} \sum_{e_i \in C} P(e|D(e_i))$$

Ranking an entity related to the entity e within a context C : rank the entity based on its probability of being generated given e and C

$$P(e'|C, e) = \frac{1}{l} \sum_{i=1}^l P(e'|D(e_i))$$

where $\{D(e_1), D(e_2), \dots, D(e_l)\}$ is the set of articles of entities that belong to C and contain e .

System Architecture

