A use-case in Digital Humanities – Some reflections on the project eAQUA

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ASV

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The BMBF project eAQUA

- **Title**: „Extraktion von strukturiertem Wissen aus Antiken Quellen für die Altertumswissenschaft“
- **Duration**: 1.4.2008 – 31.3.2011
- **Portal:** still running under http://www.eaqua.net/, see also https://de.wikipedia.org/wiki/EAQUA
- **Participants**: ASV and classics department Leipzig University
- **Goals**: apply text mining to collections of classical text (Latin, Greek) in order to extract specific knowledge
- **Key developers**: Marco Büchler and Thomas Eckart

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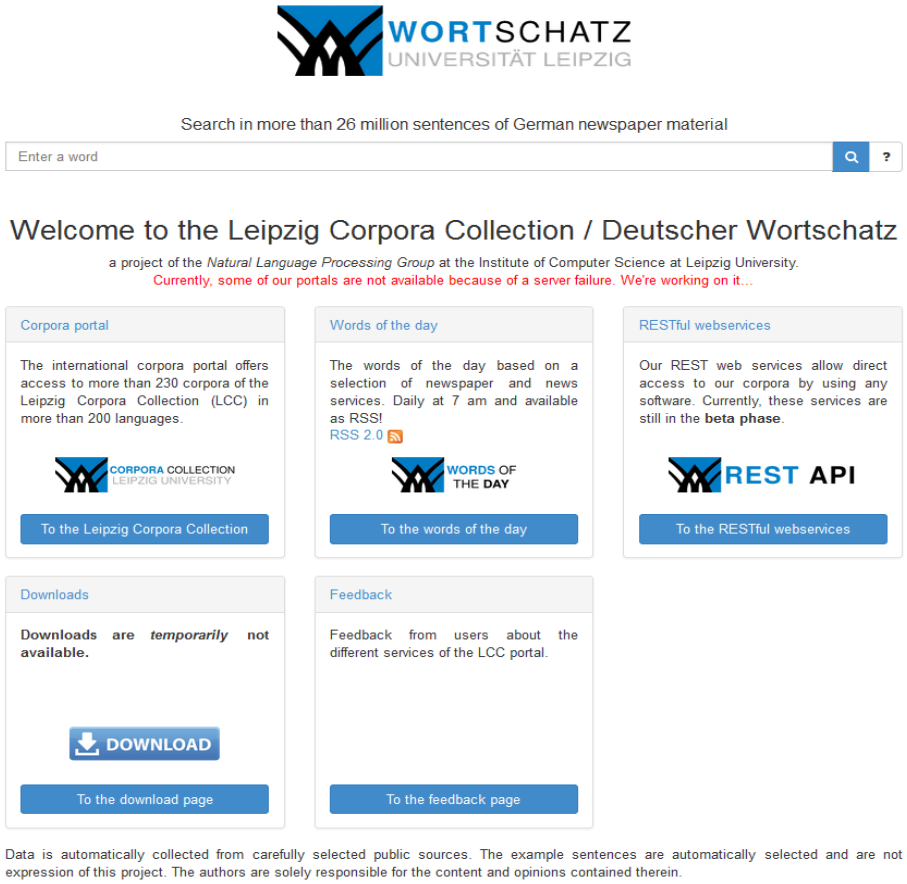
Wortschatz http://wortschatz.uni-leipzig.de/en



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Corpora http://corpora.uni-leipzig.de/de?corpusId=pol_newscrawl_2011

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Subprojects

- **Atthidographers** – Classification of Atthidographers
- **Plato** - Aftermath of Plato's writings
- **Plautine metric** – Metrical analysis of Latin comedies
- **CAMENA** - Knowledge network of Latin CAMENA corpus
- **Inscriptions** - Extraction of significant templates for different kinds of inscriptions like release documents (slave trading)
- **Papyri** - Classification of papyri (e. g. slave trading contracts) and text completion of fragmentary texts
- **Mental maps** - Building of century based mental maps and highlighting differences

Challenges from Comuter Science point of view

- **Integrating textual ressources**

  Conversion of different formats and standards

- **Software engineering issues**

  Getting classicists to understand the intent and effects of text mining algorithms and clearly define their functional requirements

- **Semantic technologies that address the long tail**

  Modifying and amending statistical and pattern based methods to effectively deal with rare events

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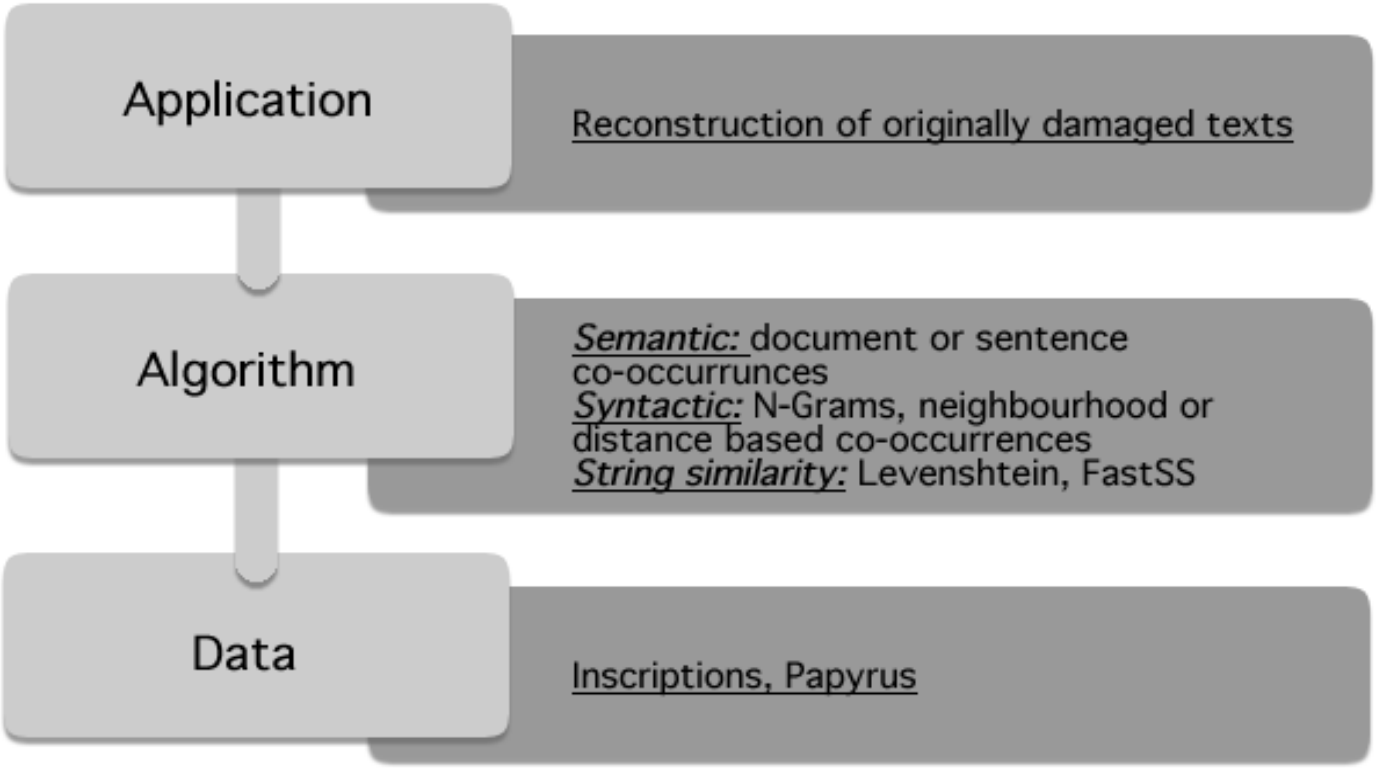
Approach



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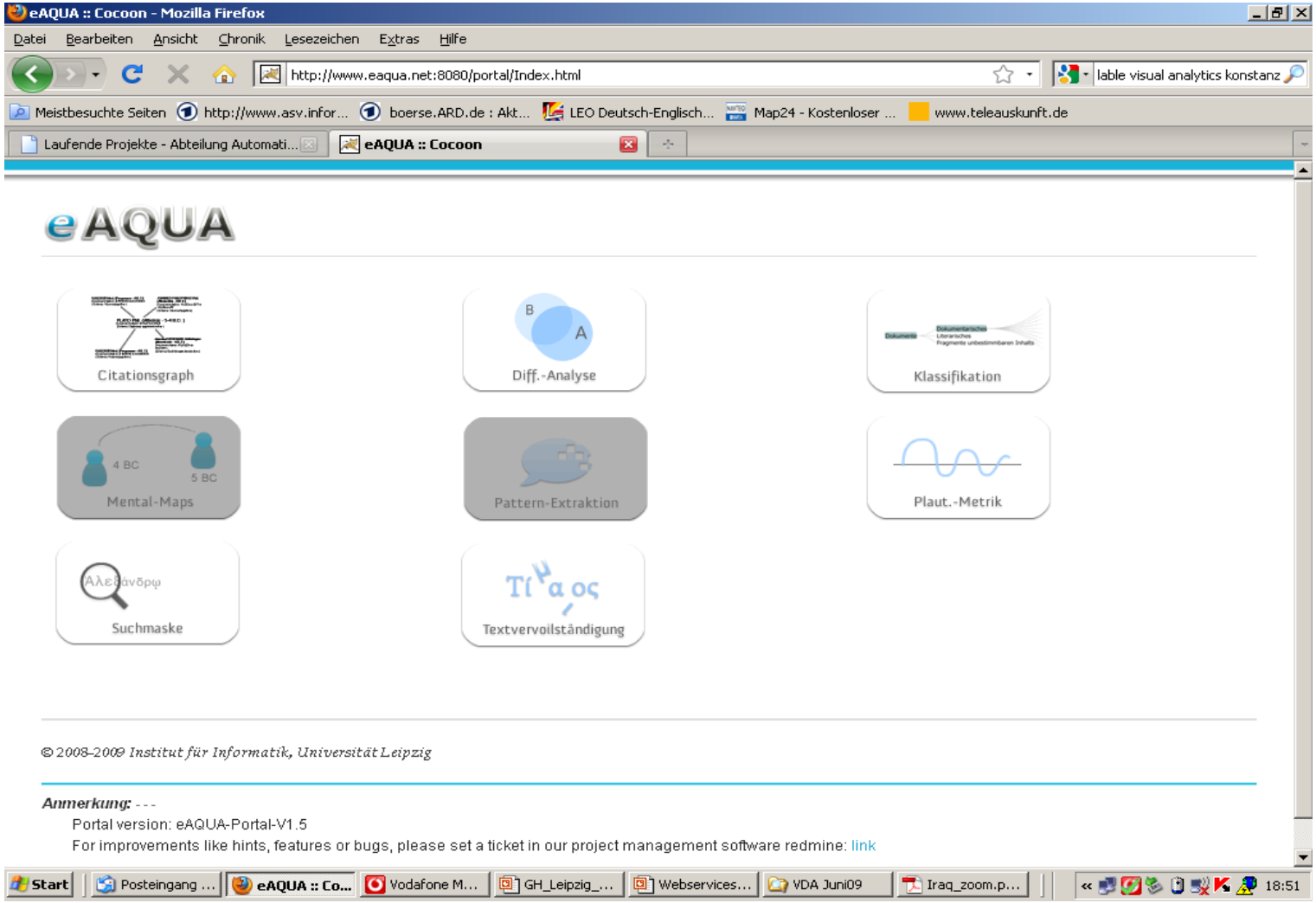
Access to portal



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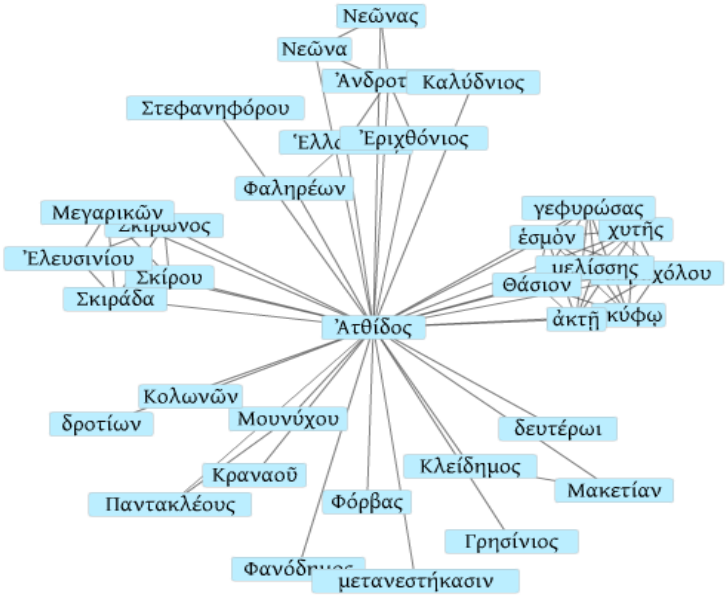
Example: Searching for „Ἀτθίδος“



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Co-occurrences to find „interesting“ neighbours

Signifikante rechte Kookkurrenzen für *Ἀτθίδος*

ἀκραχόλου (5); σκύφῳ (5); Παντακλέους (5); Μουνύχου (5); F (12); συγκυρκανήσας (4); Σκίρου (5); χυτῆς (5); Πραξίων (4); Ἐλευσινίου (5); Νεῶνας (4); Κραναοῦ (5); FHG (9); μελίσσης (6); γεφυρώσας (5); ἐσμὸν (5); Σκίρωνος (4); ἀκτῇ (5); μετανεστήκασιν (3); Μεγαρικῶν (4); Ἀτθίδος (5); Φαληρέων (3); μάντεως (5); καύματος (5); I (9); κεκλῆσθαι (5); ὠνομάσθαι (5); φησίν (13); βιβλία (6); Ἀρκεσινεῦσιν (2); Ἀνδανίῃ (2); Ἁλικαρνάσσιός (2); Μινωίταις (2); κατῃσίμωκα (2); κατεστιλβωμένον (2); βουλῆς (2); ψιλοκιθαριστικήν (2); Δήμητρος (5); Μελίτῃ (3); δημιουργικὰς (3); πῶμα (4); FGrHist (4); Ἀριστάρχειόν (2); Ἀμοργίοις (2); Ἐπίγονον (2); διαδικασίαι (2); Κλείδημος (3); νομάδας (3); γλυκὺν (4); Μακετίας (2); Ἐλεγείαις (2); φησὶν (13); ἐξῳκίσθησαν (2); γυναικονόμοι (2); ὁμωνύμωι (2); τινὸς (9); Κεκροπίδην (2); συγγενομένης (2); ἀπεχειροτονήθη (2); ἑάλωσάν (2); ἐῆς (2); Ἄγραυλον (2); Ἁλωπεκόννησον (2); διεξῆλθεν (3); ἐπεποιήκη (2); κιθάρισιν (2); μαγείρων (3); λύσιν (5); λίθου (5); πειθήμονα (2); κεδνῇ (2); ὁμογάλακτας (2); θέσμιον (2); Αἰγιαλὸν (2); Κῆρυξ (2); Ἁλιρρόθιον (2); κόβαλον (2); εὐογκον (2); σποράδην (3); Θυμοίτης (2); Ἀλκίππην (2); δράματι (3); βωμολόχον (2); νομισθὲν (2); Εὔδοξος (3); διαλέκτου (3); αὐτόχθονος (2); Ἀρεοπαγιτῶν (2); Δείναρχος (3); οἰκήσεις (3); θεωρικὸν (2); κιθαριστὴς (2); ἀπέτισε (2); θυγατρός (3); ἡγεμονεύων (2); Ξούθου (2); Ἐριχθονίου (2); φῦλον (3); Κεραμεικῷ (2); ἰδίωμα (3);

- νομάδας **is an interesting candidate**
- **Reference to quotation from the Atthis of Philochorus (3. / 2. century BC) in a normal word search hard to find**
- **Co-occurrence indicates that atthidographers may have invented a phase in Athenian history to show an evolutionary development from *nomadism* to settled life**

Citation analysis: Plato and Neo-Platonism

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Assessment – What can we learn from the project?

- **What we did well**
  - Sustainable portal, well documented
  - Demonstration of feasibility to apply text mining in the domain of classics

[Marco Büchler, Gerhard Heyer und Sabine Gründer: eAQUA - Bringing modern Text Mining approaches to two thousand years old ancient texts. In: Proceedings of the 4th International Conference on e-Science (IEEE08), 2008]

What we did not do well

- Balanced integration of requirements analysis and implementation
  - Relying on waterfall model of SE resulted in unclear specifications, ill-defined roles, and substantial delays
  - Agile paradigm would have been much more appropriate

What we did not do well

- Apply tools available at that time without designing solutions to particular research questions
  - co-occurrences, differential analysis, …
  - no word embeddings, topic models, vector space semantics, ...
- Taking tools offered by CS as a solution to research questions instead of a challenge to redesign the research question and rethink the research question in terms of computational requirements

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Thanks for listening ...

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Questions please!