# The openLegislature project

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# Outline

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# Informations

**Plenary Protocols from Bundestag**

- stenographic reports in PDF
- open to the public
- siehe bundestag.de [3]

- size of corpus circa 10GB →more than 3900 PDF

# Questions to the information in the corpus

**Statistic:**

- How many speakers are in one legislative period/total?
- How many speeches from one party/speaker?

**Keyword-search:**

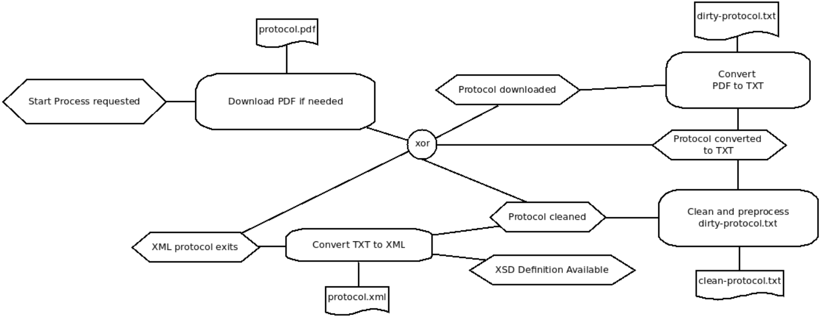
- Which speaker spoke to a special topic?

**Why this questions?**

We want more transparency! The answers are there, but too difficult to reach for all other people. That will be changed!

# Architectural process for data extraction and preparation

- Usage of Listener Patterns [5]
- Usage of Github-Library Async [4] for easy creation of concurrent process chains



# Methods

**Preprocessing:**

- stop word filter
- lower case transformation
- word count for SLDA
- tf-idf for log-likelihood
- cooccurrences per speaker

# Methods

**Algorithms:**

- Log-likelihood
- Topic Modell / SLDA

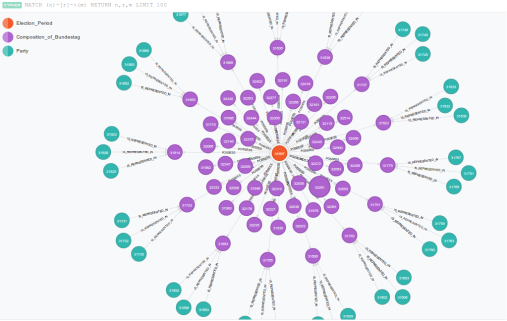
*"Latent Dirichlet allocation (LDA) is a generative probabilistic model of a corpus. The basic idea is that documents are represented as random mixtures over latent topics, where each topic is characterized by a distribution over words."*, siehe [2]
*In supervised latent Dirichlet allocation (sLDA), we add to LDA a response variable associated with each document*, [1]

# SLDA Methods

1. single step approach
   - create single dataset for an election period
   - calculate top words for each speaker
2. two step approach
   - create dataset for each protocol
   - calculate top words for each speaker
   - merge results for an election period
   - calculate top words for each speaker

# achieved artifacts

- unstructured Textfiles avaiable (PDF / TXT) for all election periods
- semi-structured XML files processed from PDF
- Metadatabase (NEO4J) with data of all election periods
- XPath query's on XML-Files



```
CYPHER MATCH (n)-[r]->(m) RETURN n,r,m LIMIT 100
```

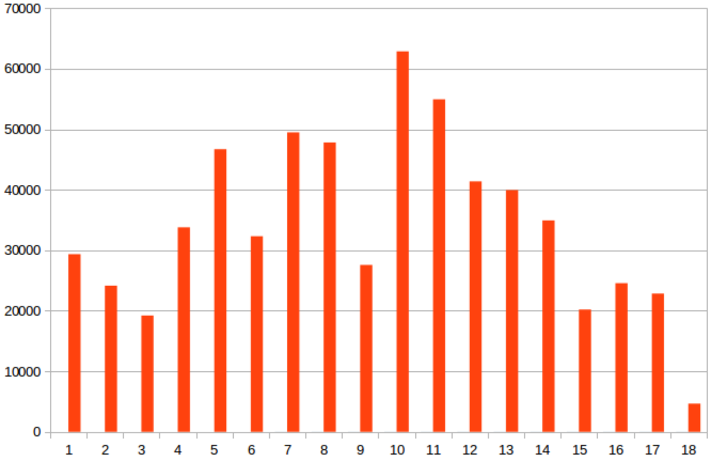
# Achieved Artifacts

- NoSQL Database:
  - all speeches
  - Speaker with all Speeches
  - appearance of words by speech
  - Speakerstatistics over all election periods
  - Partystatistics over all election periods
- website for browsing corpusdata/-statistics with visualisations
- imput files for SLDA (ARFF-files) generated ( for 18th election period )
- SLDA output: significant words for each speaker of the 18th election period

# Statistics

- 18 election periods
- 7004 speaker
- 679910 speeches
- 39 partys
- But: data not as clean as possible
    - typing errors: e.g. "CSU/CSU", "Pawelcyzk" "Pawelczyk" "Pawelzcyk"
    - parsing problems

# Statistics: Speeches pro election period



# Significant Words for Speeches

18th election period, second session: Thomas Oppermann

- 1. staat
- 2. verhandeln
- 3. snowden
- 4. nsa
- 5. praxis
- 6. geheimdienste
- 7. ausspioniert
- 8. hören
- 9. möglichkeit
- 10. schutz

# Significant Words for Speeches

18th election period, third session: Oskar Lafontaine

- 1. waffenexporte
- 2. währung
- 3. ökonomisch
- 4. zukunftsaufgaben
- 5. währungsspekulation
- 6. übernachtungen
- 7. verteilung
- 8. waggons
- 9. zug
- 10. schneller

# Significant Words for Speeches

18th election period: Angela Merkel

- 1. wohnung
- 2. verlangt
- 3. okay
- 4. osten
- 5. stadt
- 6. unterwegs
- 7. ordnung
- 8. überwunden
- 9. zielt
- 10. vermeiden

# What are our next tasks we need to accomplish?

- finalize our results, make them human accessable
- provide (easy) query interface for everyday users
- extend statistical webpage

# Last steps until the end of the semester

- reprocess xml parsing
- finish result visualization
- connect our data with the meta data database (e.g. match every speeker to gouvernment / opposition)
- Log Likelihood on the GPU with our corpus

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Christian Ullenboom. *Java ist auch eine Insel*. Galileo Computing, 2010. ISBN: 3836215063. URL: `http://www.amazon.com/Java-ist-auch-eine-Insel/dp/3836215063%3FSubscriptionId%3D0JYN1NVW651KCA56C102%26tag%3Dtechkie-20%26linkCode%3Dxm2%26camp%3D2025%26creative%3D165953%26creativeASIN%3D3836215063`.