Automatic Norm Chain Generation for German Legal Verdicts

Jieyi Zhang, 9th March 2020, Master Thesis Kickoff Presentation

Chair of Software Engineering for Business Information Systems (sebis)
Faculty of Informatics
Technische Universität München
wwwmatthes.in.tum.de

Outline

- Motivation
- Dataset
- Research Questions
- Initial Approaches and Challenges
- Timeline

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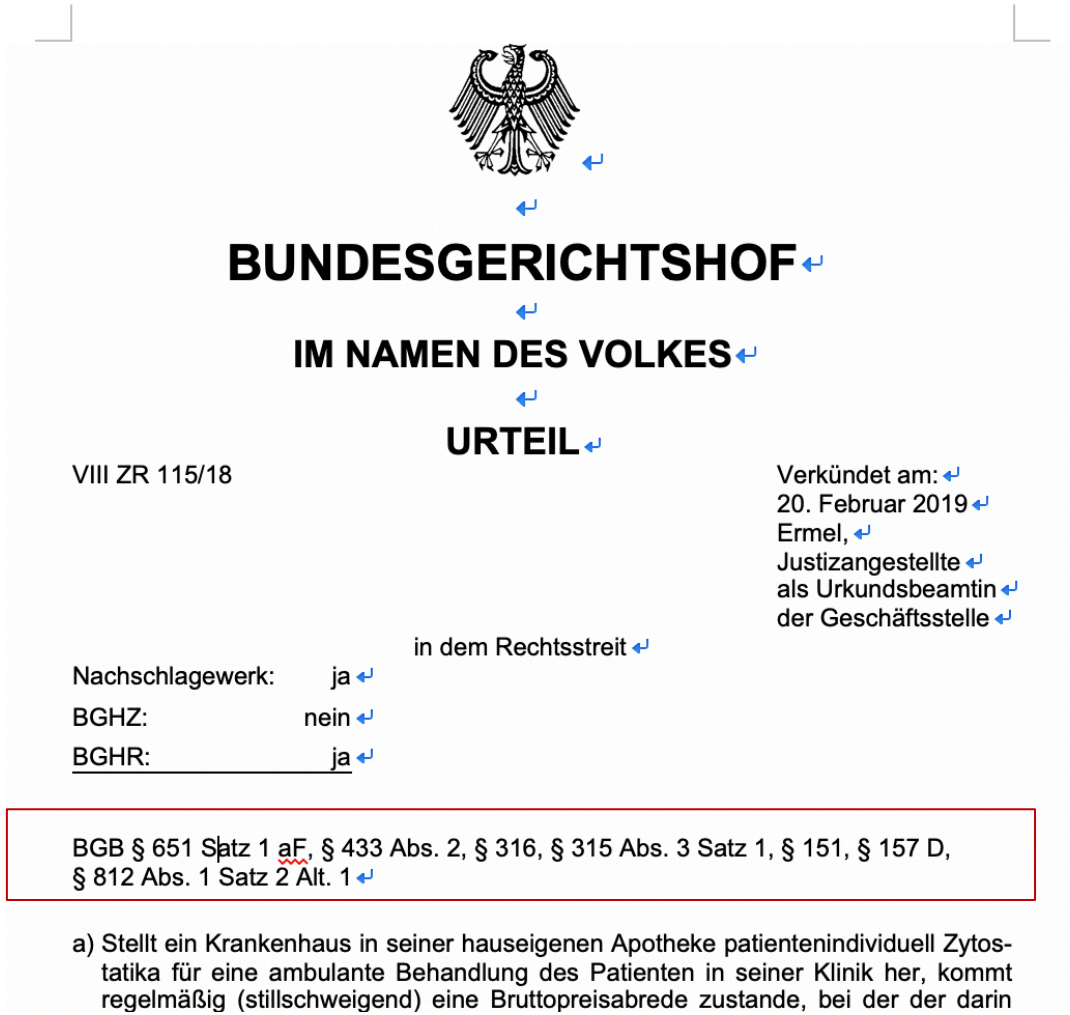
Motivation



BUNDESGERICHTSHOF

IM NAMEN DES VOLKES

URTEIL

VIII ZR 115/18

Verkündet am:
20. Februar 2019
Ermel,
Justizangestellte
als Urkundsbeamtin
der Geschäftsstelle

in dem Rechtsstreit

Nachschlagewerk: ja
BGHZ: nein
BGHR: ja

BGB § 651 Satz 1 aF, § 433 Abs. 2, § 316, § 315 Abs. 3 Satz 1, § 151, § 157 D, § 812 Abs. 1 Satz 2 Alt. 1

a) Stellt ein Krankenhaus in seiner hauseigenen Apotheke patientenindividuell Zytostatika für eine ambulante Behandlung des Patienten in seiner Klinik her, kommt regelmäßig (stillschweigend) eine Bruttopreisabrede zustande, bei der der darin

Das Landgericht hat unter Abweisung der weitergehenden Klage festgestellt, dass die zum 1. Oktober 2007 vorgenommene Preiserhöhung unwirksam und deshalb die Endabrechnung vom 14. Dezember 2007 lediglich in Höhe von 915,50 € begründet und fällig ist. Die Berufung des Klägers, mit der er sein Klagebegehren im Umfang der Klageabweisung weiterverfolgt und im Klageantrag zu 1 sein auf die Preisanpassungen bezogenes Feststellungsbegehren dahin erweitert hat, dass der Gaspreis insgesamt im streitgegenständlichen Zeitraum unwirksam und nicht fällig ist, ist erfolglos geblieben. Mit der vom Berufungsgericht zugelassenen Revision verfolgt der Kläger seine zuletzt gestellten Klageanträge weiter.

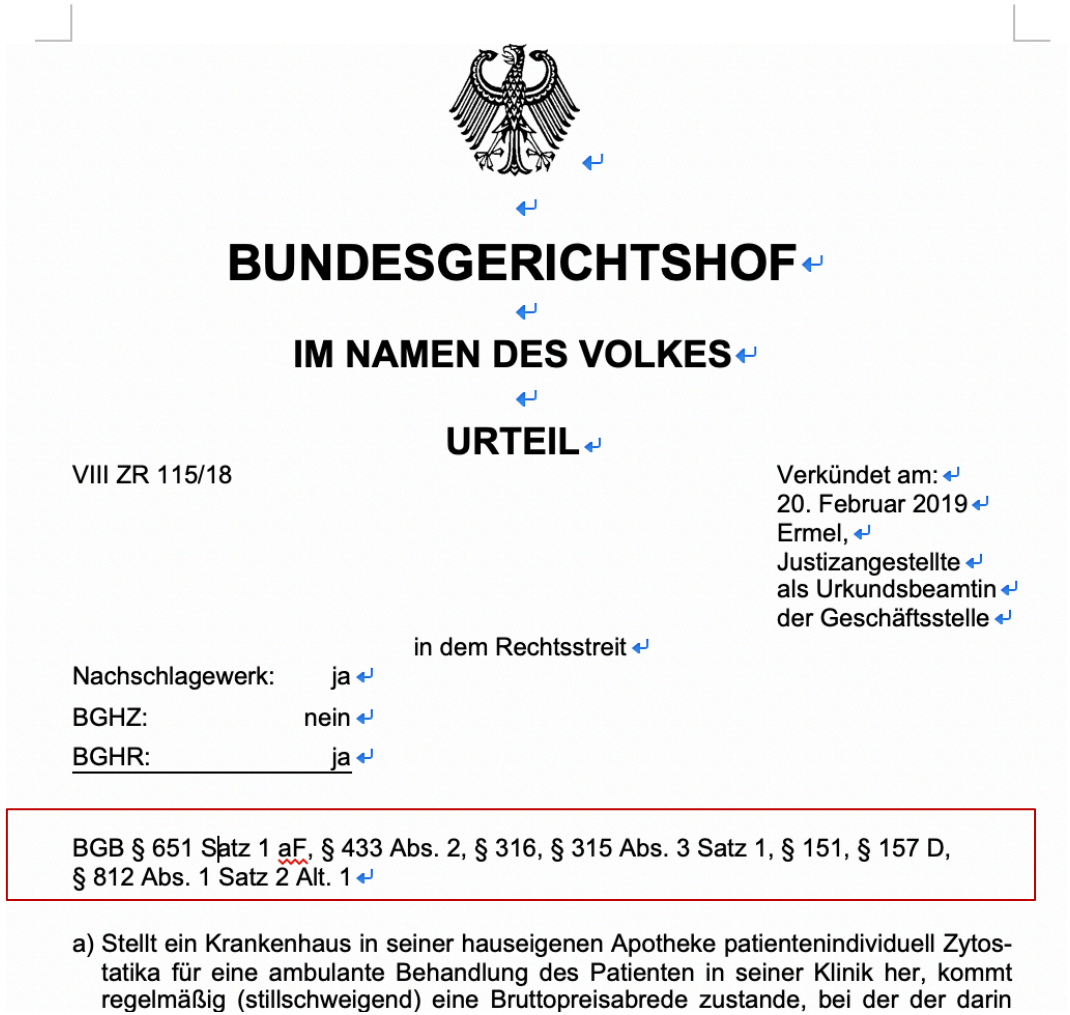
Entscheidungsgründe:

Die Revision hat, soweit sie zulässig ist, weitgehend Erfolg.

A.

Das Berufungsgericht (OLG Frankfurt am Main, RdE 2010, 104) hat zur Begründung seiner Entscheidung im Wesentlichen ausgeführt:

Motivation



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- Each published German law verdict documentation includes a legal norm chain, which are the most important norms referred by the case judgement.
- Lawyers can search for similar verdict documents based on the reference norms.
- However, this norm chain is missing for some of the verdict documents that are not yet published. Therefore, we want to automatically generate the missing reference chains based on the case content.

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- Within the sections, Referral (VERWEIS-GS) are the tags that annotate most legal norms
- Additionally, we use regular expression to extract the missing norms in plain text and check if the norms are correctly annotated.

Dataset

- Legal norm
  - Format: Code Abbr + ArticleNr. + Abs. + AbsNr. + S. + SatzNr. + Nr. + Nr.
  - Examples:
    - BauGB 116 (Federal building code, Article 116)
    - ZPO 139 Abs. 1 (German code of civil procedure, Article 139 Paragraph 1)
    - ZPO 36 Abs. 1 Nr. 6 (German code of civil procedure, Article 36 Paragraph 1 Number 6)
    - GVG 17a Abs. 2 S. 1 (Courts constitution acts, Article 17a Paragraph 2 Sentence 1)

  - Aggregate all norms at granularity level, Code Abbr + ArticleNr. + Abs. + AbsNr.
    - 46421 unique legal norms in the dataset
    - Among them, around 34% having global frequency > 1

Dataset

- Legal norm chain
  - A legal norm chain is a link between legal norms that explicitly or implicitly refer each other. In each verdict documentation, the norms in the norm chain shall be the most relevant ones according to the context and knowledge of the legal expert.

  - E.g.

    GG Art. 14 Abs. 3, GVG 17a Abs. 2 S. 1, VwGO 40, FStrG 18f Abs. 5 S. 1, BauGB 96, BauGB 116

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Research Questions

- How are the norm chains created by judges/legal authors?

- How to technically generate the norm chains for each verdict document?
  - Rule-based approach
  - Machine learning or deep learning approach

- Can norm chains be generated just by the content in the respective verdict document?

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Initial Approaches and Challenges

- Initial approaches
  - Heuristic approach based on frequency, position of the extracted norms
  - Machine learning / Deep learning models

Heuristic approach

- For each document:
  1. Extract and aggregate norms:
     - Law Code Abbr + ArticleNr.
     - Law Code Abbr + ArticleNr. + Abs. AbsatzNr.
  2. Count the frequency of each norm in a verdict document as the weight for each norm
     - Norms mentioned in more crucial sections (e.g.LEITSATZ) can be assigned with higher weights
  3. For each group of norms that share the same Law Code Abbr + ArticleNr:
     - Add the norms containing AbsatzNr with highest frequency into the norm chain.
     - If no such norm candidates, add the Law Code Abbr + ArticleNr if there are more than a specific number of norms in the group.

Heuristic approach

- Result:
  - Matched Legal Code Abbr
    - Recall score: 0.6889
    - Precision score: 0.5489
    - F1: 0.6109
  - Matched Legal Code + ArticleNr.:
    - Recall score: 0.5813
    - Precision score: 0.4700
    - F1: 0.5198
  - Matched Legal Code + ArticleNr. + AbsNr.:
    - Recall score: 0.5388
    - Precision score: 0.4340
    - F1: 0.4808

- Challenges
  - Norm detection
  - Different granularity level
  - Position and frequency are not the only criterion for the importance of the norms in a law case
  - Sequence of the norms

Machine learning and deep learning approaches

- Multi-class text classification
  - Legal norms in the norm chain are selected from a predefined list of norms (i.e., a dictionary of legal norms). These norms are treated as classes, and techniques from text classification are used to assign classes to a given document.

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  - Challenges:
    - Building a label set containing all legal norms with different granularities
    - The models need to learn the sequences of legal norm chains

[2] Computational Linguistics and Intelligent Text Processing: 6th International Conference, CICLing 2005, Mexico City, Mexico, February 13-19, 2005, Proceedings

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- Text summarization
  - Using sequence to sequence model to generate a chain of legal norms from the input verdict documents.

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- Text summarization
  - Using sequence to sequence model to generate a chain of legal norms from the input verdict documents.
  - Challenges:
    - The summarization or abstraction from the document should be a chain of legal norms only
    - Result assessment

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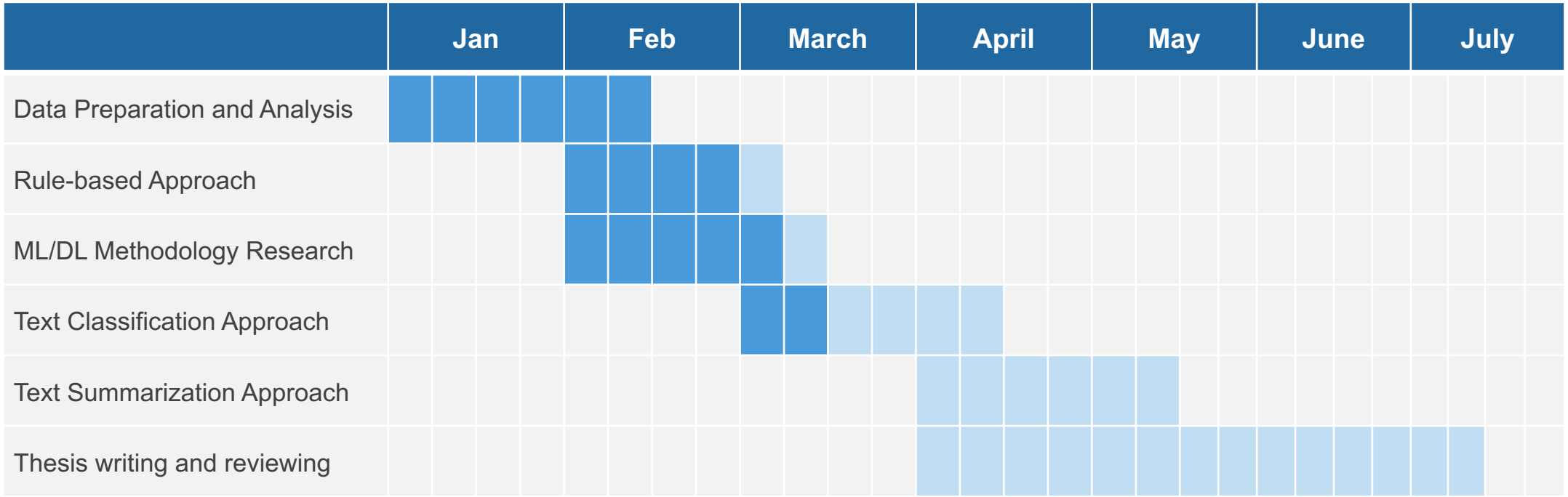
Jan
Feb
March
April
May
June
July
Data Preparation and Analysis
Rule-based Approach
ML/DL Methodology Research
Text Classification Approach
Text Summarization Approach
Thesis writing and reviewing

Thank you

MSc.

Jieyi Zhang

Technische Universität München
Faculty of Informatics
Chair of Software Engineering for Business Information Systems

Boltzmannstraße 3
85748 Garching bei München

Tel +49.89.289. 17132
Fax +49.89.289.17136

matthes@in.tum.de
wwwmatthes.in.tum.de

Backup slides

Matching Assessment

- Compare the generated norm chain with the norm chain in the annotation:
  - Norm matches compare:
    - Code Abbreviation
    - Article Number
    - Paragraph Number
    - Sentence Number
  - Chain compare:
    - Length
    - Sequence

Matching Assessment (TBD)

- Compare the generated norm chain with the norm chain in the annotation.
  - For each norm in the label norm chain, it contains BookName ArticleNr and probably AbschnittNr.
  - Create an Boolean array for each norm in label norm chain
    - For norms with form BookName ArticleNr, the array initialized as [False, False, None]
    - For norms with form BookName ArticleNr Abs. AbschnittNr, the array initialized as [False, False, False]
    - Searching for the matching norm in the generated chain:
      - If the book name matches, set the first flag as True
      - Then check if the following article number and section number also matches, if so, set the corresponding flags to True
  - After looping over all norms in label norm chain, compute a score representing the matching degree between the generated chain and the real chain:
    - # of True/(# of True + # of False)
    - If all matches: matching score = 1
    - If none matches: matching score = 0