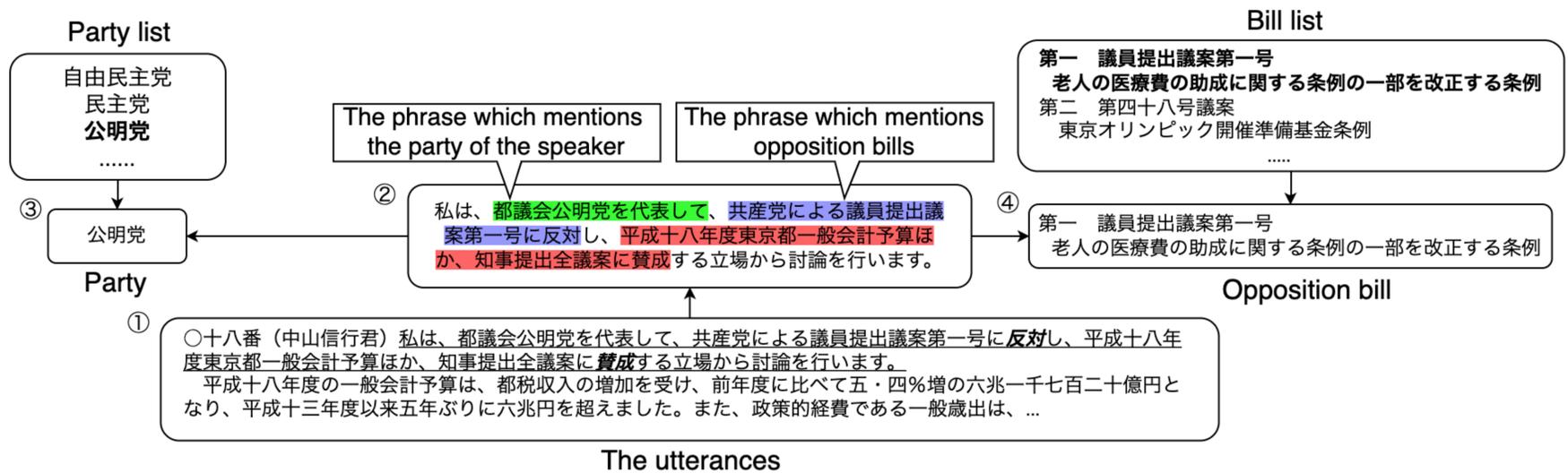


Overview

- There are two types of political party's stances: stances that are explicitly stated and those that are not stated in utterances.
- For the former, we apply a rule-based algorithm to predict stances from utterances.
- For the latter, we predict stances by analyzing the bill names.
- We also use several additional methods, and our method achieved the highest performance among the participants.

From utterances

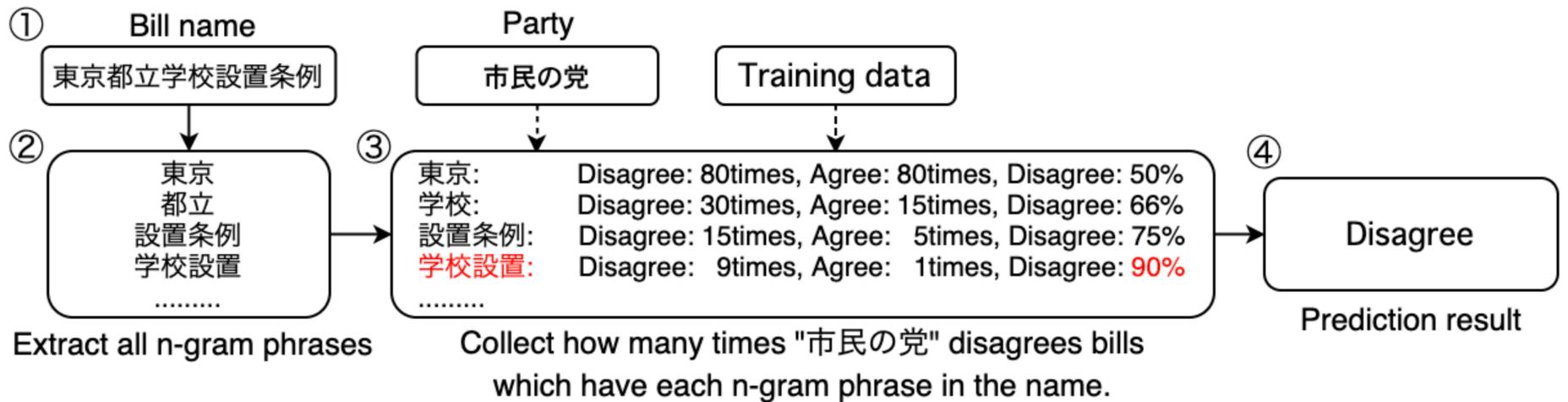
- From the plenary session and the committee utterances, we detect the stances of each party by a rule-based method.
- We extract sentences that include “賛成 (agree)” or “反対 (oppose)” words.
- We identify the party name and the bills the party is opposed to by dividing the sentence into segments using the words “代表 (on behalf of),” “賛成 (agree),” and “反対 (oppose)” as clue words.



Stance classification from utterances by a rule-based method

From bill names

- For normal bills such as “東京都立学校設置条例 (Tokyo Metropolitan School Establishment Ordinance)” we tokenize a bill name into n-grams by MeCab and acquire the tendency of the stance of each party against the n-grams.
- From the count and proportion of stance (opposition/agreement) against an n-gram, we predict the stance on a bill.
- For budget bills such as “東京都病院会計予算 (Tokyo Hospital Account Budget),” because same name bills are discussed every year, we do the aforementioned process without tokenization.



Stance classification from normal bill names by acquiring the tendency of the stance of each party against the n-grams

Using other clues

- Multiple bills are usually voted on at a time, and party stances against those bills are always the same.
 - e.g., 日程第十三から第二十三まで ... 条例外議案十件を一括して採決いたします。(We will collectively vote on Schedule No. 13 to No. 23 ...)
- When a bill is passed, most parties agree with the bill. When a bill is rejected, most parties oppose the bill.
 - e.g., 本案は、いずれも委員会の報告のとおり決定いたしました。(These bills have been decided as reported by the committee.)
- When a chair speaks a certain phrase, the stances of all parties on the corresponding bills are an agreement.
 - e.g., お諮りいたします。本案は ... 決定することにご異議ありませんか。(Let me confirm. Are there any people who oppose the decision of ... ?)
- We also use some clues: the minor opinion report, joint submission information, and the stances of other parties.

Experiment result

- We report four variants of our proposed method: using plenary session utterances, committee utterances, bill names, and other clues.
- In the automatic evaluation, our method achieved **99.75% accuracy**, which is 3.2 points higher than those of the other teams' methods.
- We also achieved the highest performance among the participants in the human evaluation.

Other teams methods	Automatic evaluation	Human evaluation
Forst	93.88	85.2
akbl	94.98	89.2
knlab	95.31	83.4
Ibrk	96.50	-
Our methods	Automatic evaluation	Human evaluation
All Agreements	93.83	-
Utterances	96.43	-
Utterances + Committee utterances	97.39	-
Utterances + Committee utterances + Bill names	99.14	-
Utterances + Committee utterances + Bill names + Other clues	99.75	98.2