



# Unfair clause detection in terms of service across multiple languages

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## Abstract

Most of the existing natural language processing systems for legal texts are developed for the English language. Nevertheless, there are several application domains where multiple versions of the same documents are provided in different languages, especially inside the European Union. One notable example is given by Terms of Service (ToS). In this paper, we compare different approaches to the task of detecting potential unfair clauses in ToS across multiple languages. In particular, after developing an annotated corpus and a machine learning classifier for English, we consider and compare several strategies to extend the system to other languages: building a novel corpus and training a novel machine learning system for each language, from scratch; projecting annotations across documents in different languages, to avoid the creation of novel corpora; translating training documents while keeping the original annotations; translating queries at prediction time and relying on the English system only. An extended experimental evaluation conducted on a large, original dataset indicates that the time-consuming task of re-building a novel annotated corpus for each language can often be avoided with no significant degradation in terms of performance.

**Keywords** Multilingualism · Terms of service · Unfair clause detection · Machine translation

## 1 Introduction

Cultural and linguistic diversity is a guiding principle of the European Union. In the context of an ever expanding Union, the concept of multilingualism stands out as one of the most prominent symbols of European historical, political, social and

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cultural diversity.<sup>1</sup> From a legal perspective, the EU commitment to multilingualism is significant as a guarantee of legal certainty, egalitarianism, clarity, transparency and democratic accountability. Accordingly, for instance, the EU legislation is generally published in all official languages.<sup>2</sup>

While multilingualism is undoubtedly a prized part of European cultural heritage and has important benefits, it also comes with costs and challenges. To illustrate, the existence of multiple official versions of every legal act, all of which are equally authentic,<sup>3</sup> may inevitably create interpretative difficulties (Pozzo 2012; Whittaker 2000). In this regard, the Court of Justice has repeatedly found that the wording used in one language version of a Union provision cannot serve as the only basis for its reading, and has pointed to the role of cross-language comparisons as well as teleological and systematic methods of interpretation.<sup>4</sup> From a more practical perspective, the EU commitment to multilingualism requires the employment of numerous translators, working in 24 official languages. Nevertheless, the increasing sophistication of IT applications, which translators rely upon, facilitates their work significantly. This also includes machine translation software, whose potential is widely recognized (European Parliament 2017).

To respond to the needs of diverse populations, applications used in multicultural societies have to support the simultaneous recognition of mixed-language input and the generation of output in the appropriate language. In the last decade, the performance of spoken language understanding systems has markedly improved, including speech recognition, dialog systems, speech summarization and text and speech translation. In the last year, large language models such as ChatGPT or GPT-4 have brought chatbots and natural language generation and understanding enter a novel dimension (Wei et al. 2022). Building powerful multilingual tools can produce a dramatic impact on the civil society, providing valuable instruments to support consumers and, more generally, citizens. However, a crucial obstacle to the widespread development of multilingual technologies in the legal domain pertains to the lack of data resources and the language expertise bottleneck. The need to foster the creation of new multilingual approaches, algorithms, data sets and resources is not new, as pointed in a 2017 study commissioned by European Parliament's Science and Technology Options Assessment Committee (Rivera Pastor et al. 2017). The study highlighted the importance for the EU of initiating a new, large-scale European Language Technology programme, called the *Human Language Project*. The initiative was foreseen as a long-term European collaborative programme between research, innovation, industry, academia, administrations and citizens with

<sup>1</sup> A recent indication of the importance of multilingualism for the EU is found in the European Commission Communication of 22 November 2005 "A New Framework Strategy for Multilingualism" (COM(2005) 596 final). The document points to the Commission's commitment to multilingualism, explores the diverse facets of its policies in this field and sets out a new framework strategy for multilingualism with proposals for specific actions.

<sup>2</sup> Regulation N. 1 determining the languages that should be used by the European Economic Community [1958] OJ 17/385 and amendments. Consider also the right to good administration, expressed in article 41(4) of the Charter of Fundamental Rights of the EU [2012] OJ C326/391.

<sup>3</sup> Judgment of the Court of 6 October 1982, C-283/81 - CILFIT, ECLI:EU:C:1982:335, para. 18.

<sup>4</sup> See, e.g., judgment of the Court of 19 December 2013, C-281/12 - Trento Sviluppo, ECLI:EU:C:2013:859, para. 25 and the case law cited.

the goal of achieving the next scientific breakthroughs for the automatic processing and generation of written or spoken natural language.

Finally, the mainstreaming of e-commerce has led to the necessity, for consumers, of higher levels of service in a variety of different languages. The EU has traditionally refrained from regulating language aspects of consumer transactions, leaving this matter to national authorities (Loos 2017).<sup>5</sup> On the one hand, language requirements (e.g. regarding standard terms) give rise to additional costs for cross-border traders, especially small enterprises. On the other hand, they might be justified for consumer protection reasons, such as supporting consumers' decision-making. The availability of information in different ethnic languages also facilitates market monitoring, since consumer protection authorities and non-governmental organisations in Europe tend to operate in their respective languages. Eventually, as part of its recent wave of platform regulation, the EU introduced language requirements targeting selected segments of digital consumer markets. Specifically, an obligation to publish terms and conditions in different language versions has been imposed on leading online platforms with broad customer bases.<sup>6</sup>

In view of the above, effective consumer protection technologies must be capable of dealing with multilingual landscapes.

In this work, we focus on the automated detection of unfair clauses in Terms of Service (ToS), which increasingly are available in multiple languages. In particular, we investigate whether it is necessary to build novel corpora and train independent models for each and every language or whether it is possible to rely on methods for automatically translating documents or transferring annotations onto the corresponding versions of the same documents in a target language. The latter problem, that of *projecting* (i.e., transferring) tags or labels across documents in different languages via sentence similarity and alignment, has recently received growing attention in the NLP community (Eger et al. 2018; Rocha et al. 2018; Galassi et al. 2020).

This paper builds upon and significantly extends results presented in the work by Drazewski et al. (2021) in the context of the CLAUDETTE project.<sup>7</sup> In particular, the contributions of this study are the following: (1) we present an extension of the multilingual parallel corpus, which now consists of 50 contracts annotated in English, Italian, German and Polish; (2) we describe an extensive experimental comparison across machine learning predictors trained either on original or projected annotations, either on original or translated documents, to assess whether the projection or translation procedures can substitute the time-consuming task of document annotation performed by domain-experts; (3) we conduct a deep error analysis for each experimental scenario; (4) we make both the novel corpus and our code

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<sup>5</sup> In the context of pre-contractual information see Art. 6(7) of Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, amending Council Directive 93/13/EEC and Directive 1999/44/EC of the European Parliament and of the Council, repealing Council Directive 85/577/EEC and Directive 97/7/EC of the European Parliament and of the Council [2011] OJ L 304/64.

<sup>6</sup> Article 14(6) of Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) [2022] OJ L 277/1.

<sup>7</sup> <http://claudette.eui.eu>.

freely available to the community for research purposes. Our findings indicate that using a system trained on English documents and making use of automatic translation at prediction time for query documents shows no performance degradation with respect to creating a novel annotated corpus for each target language.

The paper is organized as follows. Section 2 provides an overview of the related works. Section 3 describes the multilingual corpus we created and the similarities and discrepancies in the analysed ToS. Section 4 introduces the adopted methodology, while the experimental setting and the results are reported in Sect. 5. The discussion of results is presented in Sect. 6. Finally, Sect. 7 concludes.

## 2 Related works

The challenge of multilingualism in the analysis of legal documents has recently gained a lot of attention, both in the community of artificial intelligence and law, and in natural language processing.

As a major example, the work by Chalkidis et al. (2021) proposes MULTI-EURLEX, a multilingual dataset for topic classification of legal documents composed by 23k EU laws, comprising their official translation in 23 languages. The paper addresses the task of cross-lingual transfer using pre-trained language models studying many different training settings. They observe that multilanguage models obtain scores that are comparable, albeit inferior, to those obtained by monolingual models when the models are tested on the same language they are fine-tuned on. In the setting of zero-shot learning, when models are fine-tuned and tested on different languages, they observe a drastic decline in performance, which can be partially mitigated by applying various adaptation strategies. Recently, the growing interest in multilingual Legal Language Models has led to the creation of two collaborative benchmarks that include several legal tasks: LegalBench (Guha et al. 2023) and LEXTREME (Niklaus et al. 2023).

Galassi et al. (2020) study different methods of annotation projection from English to German ToS, finding that the best result is obtained using a combination of neural embeddings and Dynamic Time Warping (Sakoe 1971). In the same direction, Drazewski et al. (2021) propose a novel corpus of 25 ToS in four languages—English, German, Italian, and Polish—which was used as a starting point for the dataset developed in this paper. The dataset deployed by Drazewski et al. (2021) was also inserted within LEXTREME (Niklaus et al. 2023).

Similarly, Isbister et al. (2021) study whether it is more desirable to create novel monolingual language models, especially for low-resources languages, or instead rely on machine translation and use models already available for English. This is one of the scenarios that we will consider in our experimentation. They conduct a case study on Scandinavian languages (focusing on sentiment analysis, not on the legal domain) and find that in most cases the use of machine translation leads to better results.

Other recent approaches have proposed alternatives to annotation projection to enable the application of machine learning to low-resource languages. One example is direct transfer (Zhang et al. 2016), which proposes to employ shared features

across languages (e.g., multilingual embeddings) so that the trained model can be directly used on the test data, without the need of producing parallel corpora or projecting annotations. Yet, the approach has shown slightly worse performance than projection (Eger et al. 2018). In other cases, a weak supervision setting has been proposed (Cotterell and Heigold 2017; Kim et al. 2017) to exploit a setting with few labeled documents in the target language. Another recent idea is that of learning an alignment between word embeddings in different languages (Xu et al. 2018; Lample et al. 2018), so that this sort of mapping function can be exploited so as to transfer features from one language into another.

### 3 The source corpus

Our starting point is the multilingual parallel corpus produced by Drazewski et al. (2021), consisting of 25 Terms of Service annotated in English, Italian, German and Polish. These languages are spoken in large EU countries as well as in different regions, and they have been selected based on the availability of mother tongue legal experts for the annotation task. The existing annotations identify nine different categories for clause unfairness establishing: (1) jurisdiction for disputes in a country different than consumer's residence (<*j*>); (2) choice of a foreign law governing the contract (<*law*>); (3) limitation of liability (<*ltd*>); (4) the provider's right to unilaterally terminate the contract/access to the service (<*ter*>); and (5) the provider's right to unilaterally modify the contract/the service (<*ch*>); (6) requiring a consumer to undertake arbitration before the court proceedings can commence (<*a*>); (7) the provider retaining the right to unilaterally remove consumer content from the service, including in-app purchases (<*cr*>); (8) having a consumer accept the agreement simply by using the service, not only without reading it, but even without having to click on "I agree/I accept" (<*use*>); (9) the scope of consent granted to the ToS also takes in the privacy policy, which forms part of the "General Agreement" (<*pinc*>). In the annotations, to indicate the degree of unfairness, a numeric value was appended to each XML tag, with a value 1 meaning clearly fair, 2 potentially unfair, and 3 clearly unfair.

We doubled the size of the dataset, which now includes 50 annotated ToS for each language, i.e., 200 ToS in total. This represents a corpus size that is quite common in the AI & Law domain (see, e.g., the LexGLUE corpus (Chalkidis et al. 2020)).<sup>8</sup> The new documents were retrieved from the CLAUDETTE preexisting corpus, covering 142 English ToS (Lippi et al. 2019; Ruggeri et al. 2021; Jabłonowska et al. 2021). Such terms mainly concern popular digital services provided to consumers, including leading online platforms (such as search engines and social media). The predominant language of drafting of these ToS is English, with differing availability

<sup>8</sup> In our work, the size of the training data (i.e., sentences) across the different scenarios is approximately the same for each language. Increasing the amount of data would then similarly benefit each language so that, most likely, our findings would remain consistent also altering the size of the corpus.

of corresponding ToS in other languages. The annotation was performed by the same experts who annotated the CLAUDETTE corpus.<sup>9</sup>

To carry out the present study, the ultimate 50 ToS<sup>10</sup> were selected on the basis of three main criteria: (i) their availability in the four selected languages; (ii) the possibility of identifying a correspondence between the different versions, given their publication date; and (iii) the similarity of their structure (e.g., number of clauses, sections, etc.). To illustrate, while ToS in German were identified for 88 out of 142 ToS contained in the pre-existing CLAUDETTE training corpus, Italian and Polish versions were respectively found for 79 and 55 of these 142 ToS. Out of the 55 ToS available in the four languages, we selected those with the more closely corresponding versions based on criteria (ii) and (iii) above. Perfect correspondence across the 4 languages, however, could not be achieved for all the 50 ToS. As further discussed in Appendix A, some relevant discrepancies may persist. Table 1 shows some statistics on the corpus, i.e., the number of annotated clauses for each tag, across the four different languages. The corpus is made available for reproducibility issues and for research purposes, together with the code to reproduce our computational results.<sup>11</sup>

As a further level of analysis, we also studied the similarities and discrepancies between the different versions of the same document across the four languages. Our analysis revealed that a strong similarity between the English ToS and other language versions exists where the latter are translations of the former. We infer from the wording of the ToS that at least in 68 out of 150 cases, the German, Italian, and Polish documents were indeed translations of the English original version, as detailed in Table 7 in Appendix A. In 40 out of 50 documents we identified clauses referring to the language of the terms, by explicitly stating that: (i) in case of conflicts between translated versions and the English version, the latter shall prevail; or (ii) it is possible to access the contract in different languages and whenever a given language is not available, the provider will default to the English version. We report in Appendix A more details and examples.

Furthermore, we identified six sources of discrepancies across language versions: (i) asymmetric length of documents; (ii) sentence structure and segmentation; (iii) missing/extra clauses; (iv) country-specific clauses; (v) translation inaccuracy; (vi) legal concepts and terminology. As a general remark, it is important to note that deviations from the English source ToS are uneven across languages, being largest in German ToS. This may suggest that the drafting of such ToS is done by human agents, who may pay more attention to the national legal context and specific terminologies than automated translators. For example, note the markedly different take on the matter of privacy and data protection in these clauses of Spotify, where the

<sup>9</sup> The original CLAUDETTE paper reports a Cohen's  $\kappa$  equal to 0.871 as inter-annotator agreement.

<sup>10</sup> We selected the ToS provided by: Amazon, Booking, Dropbox, Electronic Arts, Endomondo, Evernote, Facebook, Flo, Garmin, Google, Google Payments, Grindr, Groupon, Instagram, Kardia, Klarna, LinkedIn, Microsoft, Mozilla, MyHeritage, Mysugr, Oculus, PayPal, Pinterest, Quora, Revolut, Rovio, Ryanair, Skype, Skyscanner, Snapchat, Spotify, Terravision, TikTok, Tinder, TripAdvisor, Tumblr, Twitch, Uber, Ubisoft, Visa Solution, Weebly, Western Union, WhatsApp, World of Warcraft, Yahoo, Yelp, YouTube, Zoom and Zynga.

<sup>11</sup> <https://github.com/lt-nlp-lab-unibo/Multilingual-Unfair-Clause-Detection>.

German drafters refrained from packaging data protection consent with the agreement to the ToS:

<pinc2>Your agreement with us includes these Terms and Conditions of Use (“Terms”) and our Privacy Policy. </pinc2> <pinc2>(The Terms, Privacy Policy, and any additional terms that you agree to, as discussed in the Entire Agreement section, are referred to together as the “Agreements”).</pinc2> (line 37)

Ihre Vereinbarung mit uns schließt diese Geschäfts- und Nutzungsbedingungen (“Bedingungen”) ein sowie jegliche weitere Vereinbarung, der Sie zustimmen, wie im Abschnitt Vollständiger Vertrag beschrieben (gemeinsam als die “Vereinbarungen” bezeichnet). (line 37)

The hypothesis of a more careful drafting being applied in the drafting of German language documents seems confirmed by the fact that retrieving identical corresponding versions of ToS was most difficult for German. Moreover, as shown in Table 7, the number of documents containing clauses that are specific to the country addressed by the ToS (CSC), which are missing in other languages, is higher for German versions. Conversely, we observed a lower mismatch in both Polish and Italian ToS, where significant structural differences can be retrieved only in limited cases.

## 4 Methodology

As in the original CLAUDETTE system (Lippi et al. 2019), we consider the binary classification task of detecting potentially unfair clauses in online ToS: the positive class consists of all the sentences that are annotated as unfair or potentially unfair, whereas all the remaining sentences made up the negative class. Any NLP approach can be exploited to address such task. In this paper, we are not interested in finding the best possible classifier, although we decided to test a few alternatives, as discussed in Sect. 5.<sup>12</sup> Our aim is instead to identify the best strategy to extend the classifier to other languages.

More specifically, given a machine learning system for potentially unfair clauses detection trained in the English language (such as CLAUDETTE), the problem we address is that of building the same kind of system also for different languages. We focus on other European languages, since the classifier is based on European consumer law, but the methodology we exploit is general.

Given (i) an annotated corpus of  $N$  sentences for the English language  $\mathcal{D}_E = \{(x_i^E, y_i^E)\}_{i=1}^N$ , where each sentence  $x_i^E$  is labeled with a binary label  $y_i^E$ , and (ii) a machine learning system  $\mathcal{M}_E$  trained on that corpus, the goal is to build a system that can classify sentences in a target language  $T$ . We consider the following four alternatives, whose workflow is depicted in Fig. 1.

<sup>12</sup> A wider experimental comparison can be found in Lippi et al. (2019).

**Table 1** Corpus statistics: we report the number of annotated clauses for each tag, across the four different languages

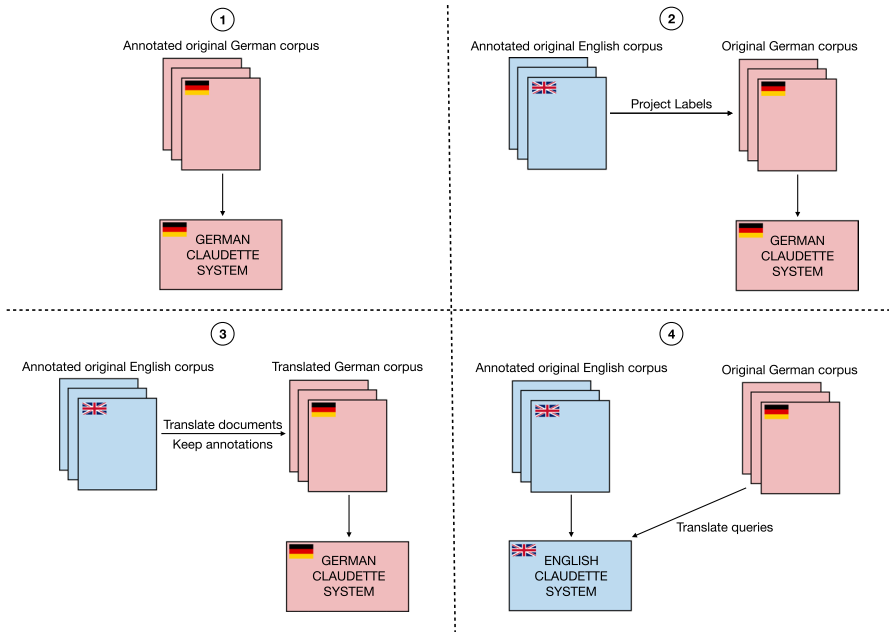
	EN	IT	DE	PL
a1	3	4	3	4
a2	48	47	40	56
a3	16	16	15	19
ch2	224	235	220	224
cr2	60	57	58	60
cr3	45	53	43	46
j1	44	48	46	46
j3	95	87	79	84
law1	53	56	55	54
law2	82	80	72	73
ltd1	63	56	64	60
ltd2	490	478	466	488
ltd3	8	6	7	8
pinc2	36	34	31	37
ter2	193	198	185	190
ter3	92	97	88	92
use2	119	117	113	123
No. unfair clauses	1651	1597	1664	1687
No. total clauses	17,383	15,888	16,579	18,873
Avg. words per clause	21.07	20.96	22.25	17.50

Suffices 1, 2, and 3 represent levels of fairness: 1 means clearly fair, 2 stands for potentially unfair, and finally 3 for clearly unfair. We remark that a clause can be annotated with multiple labels

(1) *Novel corpus for target language.* In a first scenario, for any given target language  $T$ , domain experts are required to annotate a novel corpus of  $M$  sentences  $\mathcal{D}_T = \{(x_j^T, y_j^T)\}_{j=1}^M$ , in order to re-train from scratch a machine learning system  $\mathcal{M}_T$  for that specific language. This solution is completely independent from the English version of the system, as it exploits neither  $\mathcal{D}_E$  nor  $\mathcal{M}_E$ . The process is illustrated in the top-left corner of Fig. 1.

(2) *Annotation projection onto target language.* This approach also requires to re-train a new system  $\mathcal{M}_T$  for each target language, but in this case the idea is to exploit the annotations of the original English corpus. In particular, this approach requires to collect the same contracts across the languages and to perform a projection of annotations from the English version of each document onto the corresponding document in the target language. For this step, we rely on a previous study (Galassi et al. 2020) that employs sentence embeddings and dynamic time warping to match sentences across the same document in different languages. After having obtained the corpus  $\mathcal{D}_T = \{(x_j^T, \tilde{y}_j^T)\}_{j=1}^M$  in the target language with the projected annotations  $\tilde{y}_j^T$ , it is possible to re-train from scratch the machine learning system  $\mathcal{M}_T$  for the target language. The process is illustrated in the top-right corner of Fig. 1.





**Fig. 1** The four alternatives tested in our approach, exemplified for the German language. From the top left corner, clockwise: (1) re-train from scratch a German version of CLAUDETTE, with an original German corpus; (2) project labels from English to German documents, and re-train a German CLAUDETTE; (3) translate documents from English to German, keep the original English annotations, and re-train a German CLAUDETTE; (4) use the English CLAUDETTE, and translate query documents from German

(3) *Training set translation to target language.* In this scenario, the original documents of the English corpus are translated from English to the target language  $T$ . In so doing, the original annotations  $y_i$  can be directly attached to the translated sentences  $\tilde{x}_i^T$ , thus obtaining a corpus  $\mathcal{D}_T = \{(\tilde{x}_i^T, y_i^T)\}_{i=1}^N$  for  $T$ . In this way, the machine learning system  $\mathcal{M}_T$  can be re-trained from scratch, without the time-consuming activity of annotating a novel corpus. The process is illustrated in the bottom-left corner of Fig. 1. Automatic machine translation is used ex-ante only, for training corpus creation.

(4) *Test set translation to English.* This final approach does not require to re-train any novel machine learning system  $\mathcal{M}_T$ , but just relies on the translation of test documents into English. The translated test sentences  $\tilde{x}_k^E$  are then classified using the English version  $\mathcal{M}_E$  of the system, and predictions are associated back to the original sentences in the target language  $T$ . The process is illustrated in the bottom-right corner of Fig. 1. Automatic machine translation is used ex-post only, for test queries at prediction time.

The first option seems to be the most natural scenario, that should likely give the best performance overall. Nevertheless, we remark that such a statement has yet to be proven, since the same task can have different complexity levels across different

languages, due to the nature of the task and on the specific NLP resources that can be exploited (Bender 2011; Mielke et al. 2019). This scenario is also quite costly in terms of resources needed for the creation of a novel corpus for the target language. The second and third scenarios are approximations of the first one, since they both rely on a novel machine learning system trained for the target language: both cases introduce noise, either in training documents, which are the results of a translation process (second scenario), or at the level of annotations, which are projected from English (third scenario). Therefore, in both cases we expect performance to be worse than in the first scenario. Finally, the fourth setting needs neither a novel corpus, nor a new machine learning system, while simply relying on machine translation at prediction time. Table 2 summarizes the steps and procedures needed in each one of the considered scenarios.

## 5 Evaluation

Our experimental setup is based on having an original training corpus for the English language. Following the methodology described in Sect. 4, our evaluation aims to address the following research questions:

- (RQ1) Does unfair clause detection for a novel language show better performance if the system is trained on a novel annotated corpus for that language, with respect to the case in which the English version of the system is used, relying on machine translation for the queries?
- (RQ2) Does the answer to RQ1 change with different machine translation systems having different quality levels?
- (RQ3) Does projecting labels from the original English corpus onto the documents in the target language significantly worsen performance with respect to the case of building a corpus for each target language? This would allow to re-train a different system for each language, but without the need to annotate a novel corpus.
- (RQ4) In case the original English training documents are translated to the target language, while keeping the original annotations, does system performance degrade with respect to the case in which original documents for each target language are used for training?

We conducted computational experiments on three target languages: German, Italian and Polish. In order to address the research questions, we first needed to pick a machine learning technique to employ across the different scenarios. To this aim, we compared a few classifiers on the original corpus of each language, independently (i.e., the first scenario described in Sect. 4). To keep the computational burden of the

experimental evaluation low, and to avoid approaches with some level of uncertainty (such as the initialization step in neural networks), we considered a very simple and easily reproducible setting. The approach consists in using a linear Support Vector Machine (SVM) classifier (Schölkopf et al. 2002) that exploits a set of features describing each sentence: we compared plain bag-of-words with sentence embeddings computed with ELMo (Peters et al. 2018) or BERT (Devlin et al. 2018). We did not consider fine-tuning embeddings, since this is a highly time-consuming procedure which would be hard to employ for the whole experimental validation.

We implemented all the classifiers in Python using the `scikit-learn` library, relying on the standard ELMo and BERT pre-trained models for the computation of embeddings.<sup>13</sup> In the bag-of-words representation, we used plain unigrams and bigrams, without the TF-IDF weighting. As for the translation of documents, we compared three machine translation tools: Google Translate,<sup>14</sup> Opus-MT, an open source neural machine translation toolkit that is part of the Helsinki-NLP suite,<sup>15</sup> and Apache Joshua<sup>16</sup> as a representative of older (thus, lower quality) statistical learning tools. For all our computational experiments, we used a 5-fold cross-validation at document level and we report the macro-average over the 5 folds for precision, recall, and  $F_1$ . To assess statistical significance of the results, we conducted a paired t-test on the  $F_1$  score across the values obtained over the 5 folds.

Our preliminary results for the choice of the best classifier are reported in Table 3. For this classification task, the bag-of-words representation results to be the best set of features: this is not a surprising result, since even in the original CLAUDETTE system this kind of classifier achieved the best performance (Lippi et al. 2019) among several competitors. The main reason for this result is that the lexical and syntactic information is crucial for the detection of potentially unfair clauses in contracts.

After choosing SVM with bag-of-words representation as our reference classifier, we address our four research questions. Tables 4, 5 and 6 report the results obtained on German, Italian and Polish, respectively.

Regarding **RQ1** and **RQ2**, the results across the three language consistently indicate that the fourth scenario, that of keeping only the English version of the machine learning system, relying on the translation of the queries at test time, does not perform worse than the first scenario, in which novel corpora are used for each language. For the German language with Google Translate, and for both German and Italian with Opus-MT, the improvement in  $F_1$  score for scenario 4 is even statistically significant ( $p$  value < 0.05). Note that scenario 4 is the best solution only when the translation system has a high quality (i.e., with Google Translate or Opus-MT). With lower-quality translations (i.e., with Apache Joshua) there is instead a

<sup>13</sup> For ELMo, we rely on <https://github.com/berkay-onder/ELMoForManyLangs>. For BERT, we rely on <https://huggingface.co/> (Hugging Face): specifically, models are `bert-base-uncased` (EN), `dbmdz/bert-base-italian-xxl-cased` (IT), `bert-base-german-dbmdz-uncased` (DE), `dklecze/bert-base-polish-uncased-v1` (PL).

<sup>14</sup> We used the `deep_translator` library: <https://pypi.org/project/deep-translator/>.

<sup>15</sup> <https://github.com/Helsinki-NLP/Opus-MT>.

<sup>16</sup> <https://github.com/apache/joshua>.

**Table 2** Summary of steps needed in the four considered scenarios

Scenario	New corpus	New annotations	New training	Machine translation
1: novel corpus annotation	✓	✓	✓	
2: annotation projection	✓		✓	✓
3: training set translation from EN			✓	✓
4: test set translation to EN				✓

The first one needs a new machine learning system trained with a new corpus labeled with new annotations. The second one instead exploits projected annotations. The third one uses a translated corpus. The fourth one only exploits translation at prediction time, without the need to train any novel corpus

significant drop in performance, and scenario 1 results to be the best choice according to the paired t-test ( $p$  value < 0.05 for all three languages).

For what concerns **RQ3**, all the tables clearly indicate that the results obtained by projecting the labels across languages (second scenario) are only slightly worse than those obtained with a novel corpus with original annotations (first scenario). In particular, the difference in terms of  $F_1$  is statistically significant ( $p$  value < 0.05) only for the German language. For all the languages, the small decrease in performance is mostly due to precision rather than to recall. This good performance is due to the very high reliability of the projection algorithm proposed in Galassi et al. (2020). In general, the solution of projecting annotations could be worthwhile in case of limited resources available for the development of a novel corpus.

As for **RQ4**, performance is similar between methods 2 and 3, with no major differences across languages (no  $p$  value is smaller than 0.05). Therefore, in this sense we can conclude that projecting annotations while keeping the original documents of each language, and translating training documents while keeping the original annotations are both valuable alternatives to avoid the creation of novel corpora.

Both the code and the corpus are freely available for research purposes.<sup>17</sup>

## 6 Discussion

In the following, we discuss the results obtained under the four methods, providing a quantitative and qualitative analysis, so as to identify the most frequent typologies of errors.

### 6.1 Method 1: novel corpus for target language

As for the first method, we observe a very high percentage of false negatives (with respect to the total number of clearly and potentially unfair clauses in each category)

<sup>17</sup> [http://130.136.9.51/multilingual\\_tos](http://130.136.9.51/multilingual_tos) (anonymous url).

**Table 3** Preliminary results that aim to select the best set of features (embeddings or plain bag-of-words) to be used in the computational evaluation

Features	Language	P	R	F <sub>1</sub>
ELMo embeddings	DE	0.363	0.578	0.436
BERT embeddings	DE	0.385	0.656	0.478
Bag-of-words	DE	0.667	0.619	0.638
ELMo embeddings	IT	0.349	0.680	0.457
BERT embeddings	IT	0.301	0.578	0.395
Bag-of-words	IT	0.641	0.606	0.621
ELMo embeddings	PL	0.373	0.616	0.448
BERT embeddings	PL	0.364	0.683	0.458
Bag-of-words	PL	0.642	0.620	0.630

**Table 4** Results comparison for the German language

Scenario	Lang	Training set	Test set	P	R	F <sub>1</sub>
1	DE	Original	Original	0.667	0.619	0.638
2	DE	Projected labels	Original	0.598	0.648	0.620
3	DE	Translated from EN (G)	Original	0.700	0.559	0.620
4	EN	Original	Translated to EN (G)	0.664	0.694	0.677
4	EN	Original	Translated to EN (J)	0.699	0.440	0.538
4	EN	Original	Translated to EN (O)	0.642	0.716	0.676

When translation is employed, (G) stands for Google Translate, (O) for Opus-MT, (J) for Joshua

**Table 5** Results comparison for the Italian language

Scenario	Lang	Training set	Test set	P	R	F <sub>1</sub>
1	IT	Original	Original	0.641	0.606	0.621
2	IT	Projected labels	Original	0.614	0.604	0.604
3	IT	Translated from EN (G)	Original	0.677	0.565	0.612
4	EN	Original	Translated to EN (G)	0.670	0.624	0.644
4	EN	Original	Translated to EN (J)	0.665	0.455	0.535
4	EN	Original	Translated to EN (O)	0.674	0.656	0.662

When translation is employed, (G) stands for Google Translate, (O) for Opus-MT, (J) for Joshua

**Table 6** Results comparison for the Polish language

Scenario	Lang	Training set	Test set	P	R	F <sub>1</sub>
1	PL	Original	Original	0.642	0.620	0.630
2	PL	Projected labels	Original	0.609	0.631	0.619
3	PL	Translated from EN (G)	Original	0.707	0.533	0.608
4	EN	Original	Translated to EN (G)	0.658	0.639	0.645
4	EN	Original	Translated to EN (J)	0.629	0.431	0.509
4	EN	Original	Translated to EN (O)	0.622	0.536	0.575

When translation is employed, (G) stands for Google Translate, (O) for Opus-MT, (J) for Joshua

concerning arbitration and privacy included clauses, for all the target languages. This is likely due to the lower amount of these categories within all data sets (see Table 1). Conversely, regarding false positives,<sup>18</sup> the higher number of errors pertains to fair clauses belonging to the categories of limitation of liability, jurisdiction and applicable law: this suggests that the system tends to over-predict those (potentially) unlawful clauses. Note that, for the last two categories, the higher percentage of misclassification is related to documents containing multiple country clauses (MCC) (see Table 7). From a qualitative perspective, a large group of false positives could be linked to textual indicators and word patterns which are typically symptomatic of unfairness (Lippi et al. 2019). In the target languages, such indicators often appear in different contexts, so that the concerned clauses cannot be classified as (potentially) unfair. This is the case of expressions such as “reserves the (right to)”, “at any time” and “to the maximum extent permitted by law”, which in Polish, German and Italian feature several times among false positives. The first two expressions are usually linked to termination and content removal clauses, while the latter often concerns liability.

Moreover, some errors seem to be due to variations in the subjects allowed to take certain actions. In particular, this relates to the performance of actions by users which would be considered unfair if executed by service providers. For example, clauses stating that *users* can delete uploaded content at any time were found several times among false positive misclassifications. The same is true for the related provisions on contract termination. Such clauses have not been marked as (potentially) unlawful, since their unfairness only concerns traders’ actions. In some cases the system nonetheless classified them as such, albeit more frequently in Polish than in German and Italian. Detailed examples of errors are reported in the Appendix B.1.

## 6.2 Method 2: annotation projection onto target language

Similarly to what has been observed under the first method, the higher percentage of false negatives concerns arbitration and privacy included clauses, for all the target languages. However, for Italian and Polish documents, a relevant percentage of errors has been found also with regard to termination clauses. We argue this is likely due to the noise in the annotation projection for this category, which is one of the largest in the training set. As regards false positives, in line with the observations above, the larger number of errors concern liability, jurisdiction and applicable law clauses, in particular with regard to documents containing MCC (see Table 7). This is true for all the target languages.

From a qualitative perspective, discrepancies across language versions may significantly affect the projection task and consequently the performance of the system. In particular, we found that erroneous results are often due to the following causes: (i) there is no correspondence between clauses (e.g., some of them are missing in one or more language versions); (ii) sentences are split differently; (iii) there is a

<sup>18</sup> False positives are sentences that are either not tagged, or tagged as fair (level 1). Hence, our statistics on false positives cannot account for categories that do not allow level 1.

mismatch in the ToS structure; and (iv) incorrect translations or specific linguistic choices can be identified.

*Lack of correspondence between clauses.* Sometimes errors can be linked to the lack of correspondence between clauses in source and target languages, such as when certain sentences were only present in one language version. This is the case for ToS containing country-specific clauses, which typically, though not exclusively, concern (i) limitation of liability, (ii) applicable law, (iii) jurisdiction, (iv) agreement to the contract, (v) contract modification and (vi) agreement to the processing of personal data. German ToS appear to be particularly affected by this issue. For instance, country-specific terms on liability can be found among others, in the Amazon<sup>19</sup> and Western Union ToS.<sup>20</sup> Similarly, country-specific terms on applicable law can be found, e.g., in the terms of Google Payment,<sup>21</sup> Uber<sup>22</sup> and Groupon,<sup>23</sup> and are often accompanied by the corresponding terms on jurisdiction. Detailed examples of false positives and negatives are reported in Appendix B.2.

*Different segmentation of sentences.* Division of longer passages into shorter sentences has been identified as a recurrent cause of false positives and false negatives. Usually, the meaning of a clause in source and target languages remains unaltered, but the corresponding information is differently split. In particular, we identified the following cases: (i) a long sentence is split into two or more sentences, all of which need to be annotated (hence, the tag is simply reproduced); (ii) tags are nested in one language version and split in another version; (iii) only some of the sentences in the target languages are relevant and should be annotated. Detailed examples are reported in Appendix B.2. A more sophisticated projection methodology could be designed to overcome this issue, for example allowing the projection of a single tag across multiple consecutive sentences.

*Mismatch in the ToS structure.* In some cases the mismatch between the ToS structure in the source and target languages can be so great that similarities between the individual sentences can be particularly difficult to establish, thus causing a relevant number of errors. The ToS included in our corpus usually consist of several distinct terms. While the general ones remain broadly comparable across languages, in some cases the number of discrepancies is significant, in particular with regard to (i) the division of sections and (ii) the content of clauses, which differ depending on the language version. Some clauses are only present in one version, while other are reported in different sections. Detailed examples are reported in Appendix B.2.

*Incorrect translation or linguistic choices.* Translation errors and inappropriate linguistic choices may cause the incorrect projection of labels, thus affecting the performance of the system. Translation inaccuracies and inappropriate linguistic choices may be due to: (i) cultural differences; (ii) lack of context; or (iii) grammar and syntax errors. Detailed examples are reported in Appendix B.2.

<sup>19</sup> German version of Amazon ToS (updated 21 May 2021), line 81.

<sup>20</sup> German version of Western Union ToS (accessed in February 2022), line 200.

<sup>21</sup> Google Payment ToS (updated 28 March 2018), line 528.

<sup>22</sup> German version of Uber ToS (updated 4 December 2017), line 109.

<sup>23</sup> Polish version of Groupon ToS (accessed in May 2019), lines 397, 696 and 895.

### 6.3 Method 3: training set translation to target language

Concerning false negatives, the larger percentage of misclassifications concern arbitration and contract by using clauses in all the target languages, as well as privacy included clauses for the Polish and Italian datasets, and the applicable law for German documents. Compared to method 1, the correct classification of privacy included clauses actually slightly improved for German and Italian while it significantly worsened for Polish.

Similarly to what we observed under method 1, a relevant group of false positives is linked to MCC documents (see Table 7), in relation to law and jurisdiction clauses, as well as to textual indicators and word patterns which are typically symptomatic of unfairness (Lippi et al. 2019). In the target languages, such indicators often appear in different contexts, so that the concerned clauses cannot be classified as (potentially) unfair. As noted above, this is the case of expressions such as “reserves the (right to)”, “no liability for” and “you agree”, which in Polish, German and Italian feature several times among false positives. Moreover, in German recurrent expressions include “in our discretion” and “from time to time”; in Italian “third parties”; in Polish “at any time”.

Misclassifications could be also linked to the inaccuracy of the automated translation. While we observe that its quality is generally high, this additional source of errors cannot be ruled out. In particular, the inaccurate translation of domain-specific terminology and the general complexity of the source text seem to be the main cause of such classification errors. Incorrect choice of terms as well as grammatical and syntax errors can be hard to avoid in those cases. A further challenge is posed by long or vague formulations in source text, which are frequently found in terms and conditions. In order to be comprehensible, such sentences may need to be reformulated or specified in the target language, which automated translators can still find difficult to perform. Detailed examples are reported in Appendix B.3.

### 6.4 Method 4: test set translation to English

A high percentage of false negatives concerns privacy included and arbitration clauses for all the target languages. This tendency is true for Google, Joshua and Opus-MT, although the absolute number of errors is notably higher for Joshua. By contrast, in case of the contract by using category, the number of false negatives is relatively low in the Google scenario, even outperforming the results obtained under the first method. At the same time, this category emerged as problematic when relying on Joshua, where, for instance, the number of misclassifications in Polish and German was more than doubled.

Clearly, the differences in the total number of errors can be connected to translation accuracy. In line with the results described in Sect. 5, the number of false negatives is significantly higher for Joshua than Google and Opus-MT in all categories. The results of Opus-MT are generally comparable to, and for some categories even better than Google when it comes to German and Italian. However, Google turned



out to be preferable for Polish. The error analysis revealed a variety of translation mistakes, mostly affecting Joshua.

In particular, we identify the following types of errors: (i) incorrect choice of terms when the same word in the target language can have multiple meanings, (ii) grammatical and syntax errors, e.g., when there is no alignment between relevant nouns and pronouns, (iii) incomplete translations, e.g., when the predicate is entirely missing from the translated sentence. Detailed examples of these errors are reported in Appendix B.4.

Conversely, the number of false positives for the analyzed clause categories, i.e., limitation of liability, applicable law and competent jurisdiction, is higher for Google and Opus-MT than it is for Joshua. This tendency is true for all the target languages. Moreover, as far as the last two categories are concerned, a higher percentage of misclassification is mostly related to MCC documents (see Table 7). This result is in line with what has been noted for all the other methods.

These results suggest that a difficulty exists in establishing a correspondence of meaning between concepts reflecting different legal, social, and cultural contexts. Given the domain-specificity of the legal language, the ability to guarantee a consistent horizontal equivalence strongly depends on the quality of translation. The lexical correspondence of two terms may satisfy neither the semantic correspondence of the concepts they denote, nor the requirements of the different legal systems (Ajani 2007; Tiscornia and Sagri 2012; Pozzo 2016).

## 7 Conclusions

In this paper we considered the problem of multilingualism in the context of unfair clause detection in online Terms of Service. In particular, we studied the problem from both a legal perspective and from a machine learning point of view. As for the former, we developed and analyzed a wide corpus of 200 contracts (50 documents for four different languages, namely English, German, Italian and Polish), highlighting correspondences and discrepancies between the different versions of the same contract. As for the latter, we compared four different approaches to the problem of developing clause detectors in different languages: (i) building independent corpora and systems; (ii) projecting annotation from a single, reference corpus; (iii) translating training documents while keeping original annotations; (iv) using a single system for the English language while relying on machine translation at prediction time.

An extensive computational evaluation was performed, to show the advantages and disadvantages of the different approaches. In particular, relying on machine translation at prediction time seems to be the best solution, but only in case the quality of the translation system is adequate. Projecting annotations or translating training documents is also a reasonable option, as they avoid the time- and resource-consuming procedure of building a novel corpus and system for each language of interest, while achieving only slightly worse performance.

In the future, we plan to employ also multilingual embeddings (Feng et al. 2022) to capture relationships and dependencies across different languages, and we aim to

study the problem of attaching legal rationales as explanations for the unfairness of a clause, also in a multilingual setting Ruggeri et al. (2021). Since the uneven distribution of the classes may negatively impact the performances, we also want to explore the use of data augmentation Perçin et al. (2022) to balance the dataset. From a legal perspective, we see a very promising line of research in applying this kind of methodology also to other relevant problems in consumer protection, as in the domain of privacy policies.

## A Analysis of contract discrepancies across languages

### A.1 General correspondence

We first show an example of a contract where it is explicitly stated that, in case of conflicts between translated versions and the English version, the latter shall prevail. The example is taken from the Booking ToS (updated January 23, 2021) and its corresponding Italian, German and Polish versions:

The original English version of these terms and conditions may have been translated into other languages. The translated version is a courtesy and office translation only and you cannot derive any rights from the translated version. In the event of a dispute about the contents or interpretation of these terms and conditions or inconsistency or discrepancy between the English version and any other language version of these terms and conditions, the English language version to the extent permitted by law shall apply, prevail and be conclusive. (*line 186*).

Il testo originale in lingua inglese dei presenti Termini e Condizioni potrebbe essere stato tradotto in altre lingue. La versione tradotta è ufficiosa e a scopo meramente illustrativo, quindi priva di valore legale. In caso di contestazioni o di incongruenze o discrepanze tra il testo inglese e le traduzioni nelle altre lingue dei presenti Termini e Condizioni, il testo inglese prevarrà e sarà la versione conclusiva. (*line 186*).

Die deutsche Übersetzung basiert auf dem englischen Original. Die übersetzte Version der englischen Bedingungen ist eine Gefälligkeitsübersetzung und dient nur der Information sowie innerbetrieblichen Zwecken. Im Fall von Streitigkeiten, Widersprüchlichkeiten oder Abweichungen zwischen der englischen Version und der Version in einer anderen Sprache gilt im Rahmen der gesetzlichen Vorschriften die englische Version und ist bindend. (*line 186*).

Oryginalna, angielska wersja ogólnych warunków i postanowień może zostać przetłumaczona na inne języki. Tłumaczenie wykonywane jest przez pracowników firmy, w związku z czym nie mogą Państwo domagać się żadnych praw na podstawie tłumaczenia warunków i postanowień. W przypadku jakiegokolwiek wątpliwości dotyczących treści lub interpretacji tychże warunków

i postanowień lub w przypadku niezgodności lub rozbieżności pomiędzy wersją angielską oraz którąkolwiek z wersji językowych tychże warunków i postanowień, punktem odniesienia jest zawsze wersja angielska, która jest, w stopniu określonym przez obowiązujące przepisy prawne, ostateczna i rozstrzygająca. (line 186).

As a second example, we show a contract for which it is possible to access the content in different languages and, whenever a given language is not available, the provider defaults to the English version. The example is taken from the WhatsApp ToS (updated January 4, 2021) and its corresponding Italian, German and Polish versions:

To access our Terms in certain other languages, change the language setting for your WhatsApp session. If our Terms are not available in the language you select, we will default to the English version. (line 130).

Per consultare i Termini di WhatsApp in un'altra lingua, è necessario modificare le relative impostazioni della sessione di WhatsApp. Se i Termini non sono disponibili nella lingua selezionata, verranno visualizzati in inglese per impostazione predefinita. (line 137).

Um auf unsere Nutzungsbedingungen in bestimmten anderen Sprachen zuzugreifen, ändere die Spracheinstellung für deine WhatsApp Sitzung. Falls unsere Bedingungen in der von dir ausgewählten Sprache nicht zur Verfügung stehen, wird dir standardmäßig die englische Version angezeigt. (line 126).

Aby uzyskać dostęp do naszego Regulaminu w określonych innych językach, należy zmienić ustawienie języka dla sesji WhatsApp. Jeżeli Regulamin jest niedostępny w wybranym języku, domyślnie wyświetlimy wersję w języku angielskim. (line 126).

Furthermore, 28 documents contain multiple country clauses (MCC), i.e., a set of clauses whose content varies depending on the different countries mentioned in the ToS. These clauses mostly concern the applicable law and the competent jurisdiction. In these cases, it can be deduced that the original English version has been simply translated into other languages. Consider, for instance, the following clauses taken from Electronic Arts (updated May 17, 2018) and its corresponding Italian, German and Polish versions:

If you live in the Republic of Korea, (i) this Agreement is between you and EA Swiss SÀrl, a company registered in the Geneva Companies Registry with company registration number: CH-660-2328005-8 and with offices at 8 Place du Molard, 1204 Geneva, Switzerland; (ii) the laws of Korea, excluding its conflicts-of-law rules, govern this Agreement and your use of EA Services; and (iii) you expressly agree that exclusive jurisdiction for any claim or action arising out of or relating to this Agreement or EA Services shall be the courts of Korea. If you live in the United States, Canada or Japan, (i) this Agreement is between you and Electronic Arts Inc., 209 Redwood Shores Parkway, Redwood City, CA 94065, USA; (ii) the laws of the

**Table 7** General data analysis

Service	EN	IT	DE	PL
Amazon	OV	CSC	/	/
Booking	OV	TOV	TOV	TOV
Dropbox	OV	TOV	TOV	/
Electronic Arts	MCC	MCC	MCC	MCC
Endomondo	MCC	MCC	MCC	MCC
Evernote	OV	TOV	TOV	TOV
Facebook	OV	/	/	/
Flo	OV	/	/	/
Garmin	OV	/	/	/
Google	OV	/	/	CSC
Google Payments	OV	VTO	CSC (+OV)	OV
Grinder	OV	TOV	TOV	TOV
Groupon	OV	CSC	CSC	CSC
Instagram	OV	/	/	/
Kardia	OV	TOC	CSC	/
LinkedIn	MCC	MCC	MCC	MCC
Microsoft	MCC	MCC	MCC	MCC
Mozilla	OV	TOV	TOV	TOV
MyHeritage	OV	TOV	TOV	TOV
MySugar	OV	TOV	TOV	TOV
Oculus	OV	/	/	/
PayPal	OV	CSC (+OV)	CSC (+OV)	CSC (+OV)
Pinterest	OV	/	/	/
Quora	OV	/	/	/
Revolut	OV	TOV	TOV	TOV
Rovio	OV	/	/	/
RyanAir	OV	/	/	/
Skype	OV	TOV	TOV	TOV
Skyscanner	OV	/	/	/
Snapchat	OV	/	/	/
Spotify	MCC	MCC	MCC	CSC
Terravision	OV	/	/	/
TikTok	MCC	MCC	MCC	MCC + CSC
Tinder	OV	/	/	/
TripAdvisor	OV	TOV	TOV	TOV
Tumblr	OV	TOV	TOV	TOV
Twitch	OV	/	/	/
Uber	/	/	/	CSC
Ubisoft	OV	CSC	CSC	CSC
Visa Solution	MCC	MCC	MCC	/
Weebly	MCC	MCC	MCC	MCC
Western Union	/	CSC	CSC	CSC

**Table 7** (continued)

Service	EN	IT	DE	PL
WhatsApp	OV	TOV	TOV	TOV
World of Warcraft	/	/	/	/
Yahoo	MCC	MCC	MCC	MCC
Yelp	OV	TOV	TOV	TOV
YouTube	OV	/	/	CSC
Zoom	OV	TOV	TOV	TOV
Zynga	OV	TOV	TOV	TOV

OV stands for Original Version. TOV means Translation from Original Version; MCC stands for Multiple Country Clauses. CSC indicates Clauses Specific to the Country addressed by the ToS. / means Unknown

State of California, excluding its conflicts-of-law rules, govern this Agreement and your use of EA Services; and (iii) you expressly agree that for claims and disputes not subject to the arbitration agreement below, exclusive jurisdiction for any claim or action arising out of or relating to this Agreement or EA Services shall be the federal or state courts that govern San Mateo County, California, and you expressly consent to the exercise of personal jurisdiction of such courts. If you live in any other country, (i) this Agreement is between you and EA Swiss SÀrl, a company registered in the Geneva Companies Registry with company registration number: CH-660-2328005-8 and with offices at 8 Place du Molard, 1204 Geneva, Switzerland; (ii) the laws of the State of California, excluding its conflicts-of-law rules, govern this Agreement and your use of EA Services; and (iii) you expressly agree that for claims and disputes not subject to the arbitration agreement below, exclusive jurisdiction for any claim or action arising out of or relating to this Agreement or EA Services shall be the federal or state courts that govern San Mateo County, California, and you expressly consent to the exercise of personal jurisdiction of such courts. (lines 180–184).

Se l'utente risiede nella Repubblica di Corea, (i) il presente Accordo è tra questi e EA Swiss Sàrl, società iscritta nel Registro delle imprese di Ginevra con il numero di registrazione CH-660-2328005-8 e sede all'indirizzo 8 Place du Molard, 1204 Ginevra, Svizzera; (ii) il presente Accordo e la fruizione dei servizi EA sono regolamentati dalle leggi della Repubblica di Corea, a esclusione delle norme relative ai conflitti fra ordinamenti legali; e (iii) l'utente accetta esplicitamente che la competenza esclusiva su qualsiasi rivendicazione o azione derivante da o relativa al presente Accordo o ai servizi EA spetta ai tribunali della Repubblica di Corea. Se l'utente risiede negli Stati Uniti, in Canada o in Giappone, (i) il presente Accordo è tra questi e Electronic Arts Inc., 209 Redwood Shores Parkway, Redwood City, CA 94065, USA; (ii) il presente Accordo e la fruizione dei servizi

EA sono regolamentati dalle leggi dello Stato della California, a esclusione delle norme relative ai conflitti fra ordinamenti legali; e (iii) l'utente accetta esplicitamente che la competenza esclusiva su qualsiasi rivendicazione o azione derivante da o relativa al presente Accordo o servizi EA spetti ai tribunali federali o statali della Contea di San Mateo, California, e acconsente espressamente all'esercizio della giurisdizione personale da parte di tali fori. Se l'utente risiede in qualsiasi altro paese, (i) il presente Accordo è tra questi e EA Swiss Sàrl, società iscritta nel Registro delle imprese di Ginevra con il numero di registrazione CH-660-2328005-8 e sede all'indirizzo 8 Place du Molard, 1204 Ginevra, Svizzera; (ii) il presente Accordo e la fruizione dei servizi EA sono regolamentati dalle leggi dello Stato della California, a esclusione delle norme relative ai conflitti fra ordinamenti legali; e (iii) l'utente accetta esplicitamente che la competenza esclusiva su qualsiasi rivendicazione o azione derivante da o relativa al presente Accordo o ai servizi EA spetti ai tribunali federali o statali della Contea di San Mateo, California, e acconsente espressamente all'esercizio della giurisdizione personale da parte di tali fori. (lines 180–184).

Wenn Sie in der Republik Korea leben, (i) besteht diese Vereinbarung zwischen Ihnen und EA Swiss Sàrl, einer im Genfer Handelsregister unter der Nummer CH-660-2328005-8 eingetragenen Gesellschaft mit Geschäftsadresse 8 Place du Molard, 1204 Genf, Schweiz; (ii) unterliegen diese Vereinbarung und Ihre Nutzung der EA-Services den Gesetzen von Korea unter Ausschluss des koreanischen Kollisionsrechts; und (iii) stimmen Sie ausdrücklich zu, dass für sämtliche Ansprüche oder Gerichtsverfahren aus oder im Zusammenhang mit dieser Vereinbarung oder den EA-Services ausschließlich die Gerichte Koreas zuständig sind. Wenn Sie in den USA, in Kanada oder Japan leben, (i) besteht diese Vereinbarung zwischen Ihnen und Electronic Arts Inc., 209 Redwood Shores Parkway, Redwood City, CA 94065, USA; (ii) unterliegen diese Vereinbarung und Ihre Nutzung der EA-Services den Gesetzen des Bundesstaates Kalifornien unter Ausschluss des kalifornischen Kollisionsrechts; und (iii) stimmen Sie ausdrücklich zu, dass bei Ansprüchen und Streitigkeiten, welche nicht der nachfolgenden Schiedsvereinbarung unterliegen, für sämtliche Ansprüche oder Gerichtsverfahren aus oder im Zusammenhang mit dieser Vereinbarung oder den EA-Services ausschließlich die im San Mateo County, Kalifornien, zuständigen staatlichen oder bundesstaatlichen Gerichte zuständig sind, und sie unterwerfen sich ausdrücklich der persönlichen Rechtsprechung dieser Gerichte. Wenn Sie in einem anderen Land leben, (i) besteht diese Vereinbarung zwischen Ihnen und EA Swiss Sàrl, einer im Genfer Handelsregister unter der Nummer CH-660-2328005-8 eingetragenen Gesellschaft mit Geschäftsadresse 8 Place du Molard, 1204 Genf, Schweiz; (ii) unterliegen diese Vereinbarung und Ihre Nutzung der EA-Services den Gesetzen des Bundesstaates Kalifornien unter Ausschluss des kalifornischen Kollisionsrechts; und (iii) stimmen Sie ausdrücklich zu, dass bei Ansprüchen und Streitigkeiten, welche nicht der nachfolgenden Schiedsvereinbarung unterliegen, für sämtliche

Ansprüche oder Gerichtsverfahren aus oder im Zusammenhang mit dieser Vereinbarung oder den EA-Services ausschließlich die im San Mateo County, Kalifornien, zuständigen staatlichen oder bundesstaatlichen Gerichte zuständig sind, und sie unterwerfen sich ausdrücklich der persönlichen Rechtsprechung dieser Gerichte. (lines 180–184).

Jeśli Użytkownik mieszka na terenie Korei Południowej, (i) niniejsza Umowa stanowi porozumienie między Użytkownikiem a EA Swiss Sàrl, spółką zarejestrowaną w Rejestrze Przedsiębiorców w Genewie pod numerem CH-660-2328005-8, z siedzibą przy 8 Place du Molard, 1204 Geneva, Szwajcaria; (ii) do niniejszej Umowy i korzystania przez Użytkownika z Usług EA mają zastosowanie przepisy prawa koreańskiego (z wyłączeniem zawartych w nim norm kolizyjnych); oraz (iii) Użytkownik wyraża jednoznaczną zgodę, że w przypadku wszelkich roszczeń oraz postępowań wynikających z niniejszej Umowy lub używania Usług EA bądź z nimi związanych wyłączną właściwość będą miały sądy koreańskie. Jeśli Użytkownik mieszka na terenie Stanów Zjednoczonych, Kanady lub Japonii, (i) niniejsza Umowa stanowi porozumienie między Użytkownikiem a Electronic Arts Inc., 209 Redwood Shores Parkway, Redwood City, CA 94065, USA; (ii) do niniejszej Umowy i korzystania przez Użytkownika z Usług EA mają zastosowanie przepisy prawa stanu Kalifornia (z wyłączeniem zawartych w nim norm kolizyjnych); oraz (iii) Użytkownik wyraża jednoznaczną zgodę, że w przypadku wszelkich roszczeń oraz sporów, które nie podlegają poniższym postanowieniom o arbitrażu, wyłączną właściwość do rozstrzygania wszelkich roszczeń i postępowań wynikających z niniejszej Umowy lub używania Usług EA bądź z nimi związanych będą miały sądy federalne lub stanowe właściwe dla hrabstwa San Mateo w Kalifornii, a także wyraża zgodę na właściwość osobową tych sądów względem Użytkownika. Jeśli Użytkownik mieszka na terenie dowolnego innego kraju, (i) niniejsza Umowa stanowi porozumienie między Użytkownikiem a EA Swiss Sàrl, spółką zarejestrowaną w Rejestrze Przedsiębiorców w Genewie pod numerem CH-660-2328005-8, z siedzibą przy 8 Place du Molard, 1204 Geneva, Szwajcaria; (ii) do niniejszej Umowy i korzystania przez Użytkownika z Usług EA mają zastosowanie przepisy prawa stanu Kalifornia (z wyłączeniem zawartych w nim norm kolizyjnych); oraz (iii) Użytkownik wyraża jednoznaczną zgodę, że w przypadku wszelkich roszczeń oraz sporów, które nie podlegają poniższym postanowieniom o arbitrażu, wyłączną właściwość do rozstrzygania wszelkich roszczeń i postępowań wynikających z niniejszej Umowy lub używania Usług EA bądź z nimi związanych będą miały sądy federalne lub stanowe właściwe dla hrabstwa San Mateo w Kalifornii, a także wyraża zgodę na właściwość osobową tych sądów względem Użytkownika. (lines 180–184).

Finally, 20 out of 150 documents contain one or more clauses specific to the Country (CSC) addressed by the ToS, thus differing to a certain extent from the original version, as further detailed in Sect. 2.

## A.2 Discrepancies

We hereby discuss the six sources of discrepancies that we identified within our analysis of the corpus, and which we already introduced in Sect. 3: (i) asymmetric length of documents; (ii) sentence structure and segmentation; (iii) missing/extra clauses; (iv) country-specific clauses; (v) translation inaccuracy; (vi) legal concepts and terminology.

*Length of documents across languages.* A general observation concerns the structure of documents, and in particular the asymmetric length of ToS across the different language versions. In some cases, this is the product of missing/extra clauses, for example, because of country-specific terms. This is the case, among others, for the Terravision and Spotify ToS (see Sect. 7 and discussion *infra* in this section). In other cases, asymmetric length is a feature of linguistic differences. Consider, for instance, Evernote ToS that, while showing a remarkable similarity of structure across the 4 languages (no extra/missing clauses), shows a different word and sentence count across these languages: 6,798 words for the Polish version (283 sentences), 7,580 for the German (291 sentences), 7,902 for the Italian (270 sentences) and 7,795 for the English version (279 sentences).

*Sentence structure and segmentation.*

Moving from the structure of documents to the analysis of sentences, the first type of discrepancy concerns the structure and segmentation of sentences.

With regard to the structure, this type of discrepancy is mostly illustrated by situations in which the same information, contained in a single clause in the English version, is split into more than one clause in the target languages (or vice versa). In some cases, such situations do not appear very problematic as the same tag of the original English sentence can be identically reproduced across the two sentences in the target language. Consider the following sentence from the Dropbox ToS (updated April 17, 2018) and its Italian version:

<ter2>We reserve the right to suspend or terminate your access to the Services with notice to you if: (a) you're in breach of these Terms, (b) you're using the Services in a manner that would cause a real risk of harm or loss to us or other users, or (c) you don't have a Paid Account and haven't accessed our Services for 12 consecutive months.</ter2>(line 58).

<ter2>Ci riserviamo il diritto di sospendere o terminare, con preavviso, il tuo accesso ai Servizi qualora: (a) violi i presenti Termini. </ter2><ter2>(b) utilizzi i Servizi secondo modalità che comportano un rischio reale di danni o perdite per noi o altri utenti oppure (c) non hai un Account a pagamento e non hai effettuato l'accesso ai nostri Servizi per 12 mesi consecutivi.</ter2> (line 58).

Similarly, consider the two sentences from the Google Payment ToS (updated March 28, 2018) and their correspondence with a unique sentence in the Polish version:



<use2> You can accept the Agreement by: (a) Clicking to accept or agree to the Agreement, where this option is made available to You by GPL in the user interface; or (b) Actually using the services.</use2> <use2> In this case, You understand and agree that GPL will treat Your use of the services as acceptance of the Agreement from that point onwards.</use2> (lines 105–109).

<use2>Kupujący może zaakceptować Umowę: (a) klikając opcję zaakceptowania Umowy, jeśli opcja ta została udostępniona Kupującemu przez GPL w interfejsie użytkownika, lub (b) korzystając z usług - w tym przypadku Kupujący rozumie i akceptuje fakt, że GPL będzie traktować rozpoczęcie korzystania z usług jako zaakceptowanie Umowy.</use2> (lines 105–109).

In other cases the implications for annotation are more problematic, as nested tags may need to be manually split. Consider the following sentence from the TikTok ToS (updated July, 2020) in its English and German versions.

<cr2 ltd2>In addition, we have the right - but not the obligation - in our sole discretion to remove, disallow, block or delete any User Content (i) that we consider to violate these Terms, or (ii) in response to complaints from other users or third parties, with or without notice and without any liability to you.</cr2 /ltd2> (line 161).

<cr2>Darüber hinaus haben wir das Recht - ohne dazu verpflichtet zu sein -, nach unserem Ermessen Nutzerinhalte zu entfernen, zu untersagen, zu sperren oder zu löschen, (i) bei denen wir der Auffassung sind, dass sie gegen diese Nutzungsbedingungen verstoßen, oder (ii) wenn wir damit auf Beschwerden anderer Nutzer oder Dritter reagieren.</cr2>

<lt2>Zu einer Vorankündigung Ihnen gegenüber sind wir dabei nicht verpflichtet und wir haften Ihnen gegenüber insofern auch nicht.</lt2> (line 161).

With regard to sentence segmentation, problematic cases may be those in which only one out of two or more sentences in the target language is relevant and should be marked as unfair. Consider the following clause from the Kardia ToS (updated July 1, 2019) and their Polish version:

<ter2>If AliveCor makes any future change to this arbitration provision, other than a change to AliveCor’s address for Notice, you may reject the change by sending us written notice within 30 days of the change to AliveCor’s address for Notice, in which case your account with AliveCor will be immediately terminated and this arbitration provision, as in effect immediately prior to the changes you rejected will survive.</ter2> (line 175).

Jeżeli firma AliveCor wprowadzi jakiegokolwiek przyszłe zmiany w powyższych postanowieniach dotyczących arbitrażu, inne niż zmiana adresu firmy AliveCor do Zawiadomień, użytkownik może odrzucić te zmiany poprzez wysłanie firmy AliveCor pisemnego zawiadomienia w ciągu 30 dni od wprowadzenia zmiany na adres firmy AliveCor do Zawiadomień. <ter2>W takim przypadku

konto użytkownika w usługach AliveCor zostanie natychmiast zamknięte.</ter2> W mocy pozostaną powyższe postanowienia dotyczące arbitrażu, w wersji bezpośrednio przed wprowadzeniem zmian odrzuconych przez użytkownika. (line 175).

In this case, the different segmentation results in only one of the sentences in the target language being annotated as a potentially unfair termination clause. Both, the preceding and subsequent parts remain irrelevant for the envisaged task.

*Missing/extra clauses.*

The third type of discrepancy we identify is missing/extra clauses, meaning the absence of certain clauses in the different versions of the ToS. Consider the following clause taken from the Western Union ToS (accessed November 2022) which is completely missing in the Polish and German versions.

<lt2>Neither are You liable to Us, nor is Western Union liable to You for damage caused by the proper exercise of Your or Our rights pursuant to these Terms and Conditions or by the use of the Western Union Online Service.</lt2> (line 212).

The same is true for the following arbitration and jurisdiction clauses in the English version of the Spotify ToS (effective as of 9 September 2015), which are absent in the German version:

<j3>Further, you and Spotify agree to the jurisdiction of the courts listed below to resolve any dispute, claim, or controversy that arises in connection with the Agreements (and any non-contractual disputes/claims arising out of or in connection with them).</j3> <law2 j3>(In some cases, that jurisdiction will be “exclusive”, meaning that no other countries’ courts can preside over the matter; have jurisdiction; in other cases, the jurisdiction is “non-exclusive”, meaning that other countries’ courts may have jurisdiction as well. This is indicated in the chart as well.)</j3 /law2> (line 176).

Furthermore, we observed that a sizeable proportion of the Spotify ToS on dispute resolution was removed from the German version and replaced with a single clause (line 175).

Terms of service in target languages may further include extra (potentially) unfair clauses. Consider the following sentences from the German and Polish Groupon ToS (accessed February 9, 2022), which are missing in the English terms:

<lt2>Groupon Travel nie ponosi odpowiedzialności za zmianę cen w innych walutach, ponieważ mogą one wynikać z kursu wymiany walut stosowanego przez Państwa bank.</lt2>(line 771).

<lt2>Groupon Travel garantiert ihn nicht und übernimmt keinerlei Verantwortung im Fall einer Änderung, da wir ihn nicht beeinflussen.</lt2> (line 775).

Missing/extra clauses may be the product of an omission or error, but they also may be the product of deliberate choices to draft contracts differently for different

national markets. Such different choices may be made necessary by country-specific services offered only at certain locations, by the need to comply with country-specific regulation, or, more generally, reflect the company's intention to regulate the contractual relationship differently in different countries. This is confirmed by the presence of country-specific clauses (CSC), as detailed below.

*Country-specific clauses.*

Our analysis revealed that 20 out of the 150 ToS contained country-specific clauses (see Table 7). The choice to draft contracts differently for different national markets may be made necessary to comply with EU norms and judicial decisions<sup>24</sup> as well as with country-specific regulations. In many cases these clauses concern the competent jurisdiction and the applicable law. Consider, for instance, the following clauses taken from the Klarna ToS (updated November 6, 2021) and their corresponding Italian (updated September 15, 2021) and Polish (updated November 10, 2021) versions:

<law2 j3>This Agreement is governed by the laws of England and Wales and is subject to the exclusive jurisdiction of courts of England and Wales.</j3 / law2> <j1>If you are a resident of Northern Ireland you may also bring proceedings in Northern Ireland, and if you are a resident of Scotland, you may also bring proceedings in Scotland.</j1> (line 202).

<law1>Il nostro rapporto contrattuale sarà regolato dalla legge italiana.</law1> <j1>Qualsiasi controversia derivante da o in relazione a questo Servizio sarà soggetta al Tribunale del tuo domicilio.</j1> (line 124).

<law1>Niniejsze warunki podlegają prawu polskiemu.</law1> <j1>Spory wynikające z niniejszych warunków podlegają sądom właściwym zgodnie ze znajdującymi zastosowanie przepisami o właściwości sądów, w tym przepisami Kodeksu postępowania cywilnego.</j1> (line 212).

As a further example, the need to comply with country-specific regulation may result in substantive differences in clauses providing for age requirements to use certain services.<sup>25</sup>

Finally, the presence of these clauses may be also due to the company's intention to regulate the contractual relationship differently in different countries. In a few cases, especially in the German versions of some ToS, this may lead to an entirely different approach to the drafting of clauses related to certain matters, like provider's liability. Among others, such discrepancies were found in the Electronic Arts ToS.<sup>26</sup>

Sometimes, additional terms, which only apply to users from a certain country, are made available by clicking on a separate link. This is the case, for

<sup>24</sup> With regard to the competent jurisdiction, see for instance the judgment of the Court of 27 June 2000, C-240/98 - Océano Grupo Editorial and Salvat Editores, ECLI:EU:C:2000:346.

<sup>25</sup> Cf. the English and German versions of Electronic Arts ToS (updated May 17, 2018) at line 33.

<sup>26</sup> Electronic Arts ToS (updated 17 May 2018), lines 164–166.

instance of Oculus,<sup>27</sup> TikTok<sup>28</sup> and Yahoo,<sup>29</sup> containing extra terms for German users in the first two cases, and for both German and Italian in the latter case.

*Translation inaccuracy.*

In some cases, the discrepancy consists in errors or inaccuracies in translation from the source English ToS into the target languages. Such errors and inaccuracies may change the legal effects of a clause, with consequences on its qualification as potentially unfair by the annotators. As an example, consider the following clause taken from the Evernote ToS and their Italian version (updated August 28, 2017):

<use2>If you do register for or otherwise use our Service you shall be deemed to confirm your acceptance of the Terms and your agreement to be a party to this binding contract.</use2>(line 4).

La registrazione al Servizio o il suo uso richiedono di confermare la propria accettazione dei Termini, cosa che rende di conseguenza l'utente un soggetto vincolato al presente contratto. (line 4).

The English sentence is a clear example of a contract by using clause, thus potentially unfair. By contrast, the Italian translation simply states that in order to register for the service, the consumer needs to accept the terms. Thus, the Italian version has not been annotated. A similar discrepancy is not observed in the German and Polish versions of this sentence, thus suggesting a translation error. This seems to be further supported by another discrepancy between English and Polish versions in the same ToS. Consider the following clauses:

We invite you to access our websites and use the Evernote service, but please note that your invitation is subject to your agreement with these Terms of Service. (line 2).

<use2>Zapraszamy do przeglądania naszych stron internetowych i korzystania z usługi Evernote, ale podkreślamy, że korzystając z zaproszenia, akceptujesz Warunki świadczenia usługi wymienione poniżej.</use2> (line 2).

In contrast to the English version, the Polish formulation indicates that “by making use of the invitation” the user “accepts the [company’s] terms of service”. Accordingly, the sentence has been annotated as a potentially unfair contract by using clause. A similar discrepancy is not identified in the German and Italian ToS.

Similarly, consider the English and Polish versions of the following clause taken from the Booking.com ToS (updated on 23 January 2021).

Booking.com does not own or endorse the photos/images that are uploaded. (line 174).

<sup>27</sup> Cf. English version of Oculus ToS (updated 11 April 2022), line 260 (“Certain specific terms that apply only for German users are available at <https://store.facebook.com/legal/quest/terms-applicable-to-germany/>. Please review these terms carefully if you reside in Germany”).

<sup>28</sup> Cf. German version of TikTok ToS (updated June 2020), line 224.

<sup>29</sup> Cf. English version of Yahoo ToS (effective 25 May 2018), lines 556 and 558.

<lt2>Booking.com zrzeka się wszelkiej odpowiedzialności za publikowane zdjęcia</lt2>. (line 174).

While the Polish clause states that the company is not responsible/liable for the uploaded images and thus it has been marked as a potentially unfair limitation of liability, the English version only states that the service provider does not endorse such content.

Translated documents can also feature syntax errors (e.g., word omissions), obscuring the meaning of a sentence. Consider the English and Polish versions of the following clause on dispute resolution from the Evernote ToS (updated on August 2017):

<j3>Except where our dispute is being resolved pursuant to an arbitration (as provided below), if you are not a resident of the United States, Canada, or Brazil, you agree that any claim or dispute you may have against Evernote must be resolved exclusively by the courts in Zurich, Switzerland.</j3> (line 121).

<j3>Z wyjątkiem sytuacji, w których nasz jest rozstrzygany na podstawie arbitrażu (zgodnie z poniższym opisem), jeśli nie jesteś mieszkańcem Stanów Zjednoczonych, Kanady lub Brazylii zgadzasz się, że wszelkie roszczenia lub spory, które możesz mieć przeciwko Evernote, muszą być rozstrzygane wyłącznie sądy zlokalizowane w Zurychu, w Szwajcarii.</j3> (line 121)

It appears that the word “dispute” is missing in the Polish version of the above clause, similarly to the two other related clauses (lines 119 and 120). In consequence, the complete meaning of the sentence is difficult to reconstruct for the human reader.

#### *Legal concepts and terminology.*

The last type of discrepancy derives from the choice of legal terminology, which may be more or less deliberate. Indeed, legal languages remain profoundly culture-bound and terminological nuances in different languages may be difficult to capture regardless of the applied translation process (see Sect. 1).

In our corpus this type of discrepancy emerges in relation to the use of particular terms, for instance terms related to responsibility and liability. Unlike in English, in the other languages of our corpus such a distinction is hard to capture.

Consider, for instance, the following clause taken from the Pinterest ToS (updated May 1, 2018) and its Polish and Italian counterparts that employ the expressions “odpowiedzialność” and “responsabilità”, without differentiation between responsibility and liability:

<lt2>Pinterest takes no responsibility and assumes no liability for any User Content that you or any other person or third party posts or sends using our Service.</lt2> (line 88).

<lt2>Pinterest nie ponosi odpowiedzialności za jakiegokolwiek Treści użytkownika, które Ty lub inni użytkownicy albo osoby trzecie umieszczacie lub wysyłacie przy użyciu naszych usług.</lt2>(line 88).

<lt2>Pinterest non si assume alcuna responsabilità per i Contenuti dell'utente che tu o qualsiasi altra persona o terza parte pubblicate o inviate utilizzando il nostro Servizio.</lt2> (line 88).

While linguistic variations related to responsibility (obligations) and liability do not always entail differing annotations, they sometimes may. Consider, for example, the following situation from the Terravision ToS (as accessed on 31 January 2021):

<lt2>Terravision is not liable to passengers who did not reserve their trip.</lt2> (line 108).

Terravision non ha alcun obbligo nei confronti dei passeggeri che non hanno prenotato la corsa. (line 108).

Here, a translation of the English term “to be liable” into the more generic Italian “avere obbligo” results in different annotation choices in the different languages.

## B. Detailed examples of false positives and false negatives

### B.1 Method 1: novel corpus for target languages

#### B.1.1 Variations in the subject of the sentence

As we noted in Sect. 6, some errors concerning content removal could be linked to different subjects of the clauses. More precisely, a number of false positives relate to actions taken by users, which would be deemed unfair if adopted by service providers. To illustrate, consider the following clause on the account deletion right from the Zynga ToS and its corresponding Polish and German versions (updated October 7, 2020):

You may stop using our Services at any time and may request that we delete your Account at any time by following the instructions in our Privacy Policy. (line 95).

Możesz zaprzestać korzystania z Serwisu w dowolnym momencie i zażądać usunięcia przez nas Konta w dowolnym momencie, postępując według instrukcji zawartych w naszej Polityce Prywatności. (line 95).

Du kannst deine Nutzung unserer Services jederzeit einstellen und bist jederzeit berechtigt, zu verlangen, dass wir dein Konto löschen, indem du die in unserer Datenschutzrichtlinie enthaltenen Anweisungen befolgst. (line 95).

As a further example, consider the following clause from the Quora ToS and its corresponding Italian version (updated October 23, 2018):

You may close your account at any time by going to account settings and disabling your account. (line 33)

Puoi cancellare il tuo account in qualsiasi momento tu voglia accedendo alle impostazioni del tuo profilo e disattivando il tuo account.(line 33)

### **B.1.2 Prominent expressions used in different contexts**

Another group of false positives could be linked to the portions of text which are typically indicative of unfairness, but which appear in different contexts. To illustrate, consider the following examples from the Polish and Italian versions of Ubisoft ToS (updated 12 May 2020):

Zastrzegamy sobie prawo do odrzucenia wybranej przez użytkownika nazwy użytkownika i/lub awatara według naszego wyłącznego uznania. (line 65).

Ci riserviamo il diritto, a nostra esclusiva discrezione, di rifiutare qualsiasi nome utente e/o avatar scelto dall'utente. (line 65).

The corresponding sentence in the English ToS (updated 12 May 2020) is formulated as follows:

We reserve the right, at our sole discretion, to refuse any username and/or avatar you have chosen. (line 65).

The sentence contains the reference to both “reserving the right” and “sole discretion”; however, not in the context that is relevant to the annotated categories.

## **B.2 Method 2: annotation projection onto target languages**

### **B.2.1 Lack of correspondence between clauses**

In the following, we provide some examples of false positives and negatives due to the lack of correspondence between clauses. As noted in Sect. 6, this issue is mostly linked to country-specific clauses, which typically, though not exclusively, concern (i) limitation of liability, (ii) applicable law, (iii) jurisdiction, (iv) agreement to the contract, (v) contract modification and (vi) agreement to the processing of personal data.

Examples of country-specific clauses concerning the provider’s liability and the applicable law can be found in the German version of Spotify ToS (updated September 9, 2015). Both of them are drafted in a more balanced way compared to the English ToS (updated November 1, 2016) and were identified as false positives.

Some aspects of this section may not apply in some jurisdictions if prohibited by applicable law. (line 159).

Einige Absätze in diesem Abschnitt gelten in einigen Rechtsordnungen nicht, wenn dies nach geltendem Recht unzulässig ist. <ld1>Weiterhin ist Spotify vollumfänglich für Schäden haftbar, die aus Schäden entstehen, die aus der Verletzung des Lebens, des Körpers oder der Gesundheit entstehen.</ld1> (line 159).

The English version of the clause is shorter and only provides that some of the liability limitations may not apply in certain countries. The German ToS, by contrast, go on to say that Spotify is fully liable for damages to life, body or health.

A similar tendency can also be observed in relation to applicable law:

<law2>Unless otherwise required by a mandatory law of a member state of the European Union or any other jurisdiction, the Agreements (and any non-contractual disputes/claims arising out of or in connection with them) are subject to the laws of the state or country listed below, without regard to choice or conflicts of law principles.</law2> (line 175).

<law1>Sofern nicht von der Gesetzgebung eines Mitgliedsstaats der Europäischen Union oder einer anderen Rechtsordnung vorgeschrieben, unterliegen die Vereinbarungen (und alle außervertraglichen Streitigkeiten/Forderungen aus oder in Verbindung mit ihnen) den Gesetzen der Bundesrepublik Deutschland, ungeachtet der Regelungen bezüglich Rechtswahl und der Kollisionsnormen.</law1> (line 175).

The English version of this clause contains more general stipulations, describing the applicable law depending on the country in which Spotify services are used. The opening clause cited above is followed by a table which provides e.g., that for consumers in Poland and Italy the laws of Sweden are applicable. By contrast, the German version explicitly provides that the German law applies to consumers in Germany.

As an example of a country-specific clause concerning the agreement to the contract, consider the following term taken from the German version of Electronic Arts ToS (updated 18 May 2018) as compared to the English version (updated May 17, 2018):

Durch anklicken von „ich stimme zu“ (o.ä.) stimmen sie diesen bedingungen zu (line 7).

<use2>By using EA services, you agree to these terms.</use2> (line 7).

While under the English ToS the consumer agrees to the terms simply by accessing the services, the German version stipulates that such an agreement takes place by clicking on the button “I agree”. As a consequence, the German clause was not labelled as a potentially unfair consent by using clause and it is an example of a false positive instance.

As an example of a country-specific clause concerning contract modification consider the following term taken from the Polish version of the Amazon ToS (updated August 17, 2021) as compared to the English version (updated August 11, 2021):



<ch2>We reserve the right to make changes to any Amazon Services, policies, terms and conditions including these Conditions of Use, and Service Terms at any time.</ch2> (line 107).

<ch2>Jeżeli posiadasz konto Amazon, oraz o ile dana zmiana nie stawia Cię w sposób niesprawiedliwy w niekorzystnym położeniu, możemy dokonać zmiany zasad polityki oraz warunków korzystania z Usług Amazon, w tym niniejszych Warunków Użytkowania i Warunków świadczenia Usługi, bądź ich dowolnej części, w dowolnym czasie z następujących przyczyn: z przyczyn natury prawnej lub regulacyjnej; ze względów bezpieczeństwa; w celu udoskonalenia istniejących funkcji lub uzupełnienia naszych Usług o dodatkowe funkcje; w celu wprowadzenia zmian wynikających z postępu technologicznego; wprowadzenia uzasadnionych korekt technicznych do naszych Usług; jak również w celu zapewnienia ciągłej dyspozycyjności naszych Usług.</ch2> W przypadku dokonania zmian poinformujemy Cię o tym w stosownym czasie oraz przypomnimy o przysługującym Ci prawie do wypowiedzenia korzystania z dotkniętej zmianą Usługi lub Usług Amazon bez konieczności zachowania okresu wypowiedzenia. (line 96).

While the English ToS authorize the company to modify the contract at any time, the Polish version is significantly more detailed and balanced in its content. Specifically, the first sentence lists the potential reasons for contract modification while the latter provides that the consumer will be notified and will have the right to terminate the contract. Notably, despite significant differences with the English version, the first sentence was correctly identified by the system as a contract modification clause and only the second one was found among false positives.

Although country-specific clauses we observed were typically more favourable to consumers compared to English terms, opposite examples could also be identified. Consider the following clause on the agreement to the processing of personal data in the Polish version of Garmin ToS (updated April 3, 2014) which is missing from the English ToS and was identified as a false negative:

<pinc2>Korzystając ze strony my.garmin.com, użytkownik wyraża zgodę na zbieranie, wykorzystywanie i udostępnianie tego typu informacji zgodnie z postanowieniami niniejszego paragrafu i oświadczenia o ochronie prywatności przez firmę garmin.</pinc2> (line 74).

## B.2.2 Different segmentation of sentences

In the following we provide some examples of false positives and negatives due to a different segmentation of sentences in the target languages, with regard to the following cases: (i) a long sentence is split into two or more sentences all of which need to be annotated (hence, the tag is simply reproduced); (ii) tags are nested in one language version and split in another version; (iii) only some of the sentences in the target languages are relevant and should be annotated.

The first situation we identify is when one longer sentence in one language is split into two or more sentences in another language, all of which need to be annotated

(hence, the tag is simply reproduced). To illustrate, consider the following example from TikTok Tos in English and German (both updated in July 2020):

<lt2>However, we will not be liable for damage that you could have avoided by following our advice to apply an update offered to you free of charge or for damage that was caused by you failing to correctly follow installation instructions or to have in place the minimum system requirements advised by us.</lt2>(line 200).

<lt2>Wir haften jedoch nicht für Schäden, die Sie dadurch hätten verhindern können, dass Sie unseren Rat befolgen, ein Ihnen kostenlos angebotenes Update vorzunehmen.</lt2> <lt2>Weiter haften wir nicht für Schäden, die auf Ihrem Versäumnis beruhen, die Installationsanweisungen zu befolgen oder die Mindestanforderungen an das System zu erfüllen, die wir empfehlen.</lt2>. (line 200).

In the example above, both sentences in the German limit the liability of the trader and accordingly were marked as <lt2>. However, only the first sentence was correctly identified, while the second one was found among false negatives.

Another situation is when the tags are nested in one language version and split in another version, as in the case of the following clause from the English and German YouTube ToS (both updated 5 January 2022):

<law1 j1>If you are based in Germany, this Agreement, and your relationship with YouTube under this Agreement, will be governed by the laws of Germany under the exclusion of the CISG, and legal proceedings may be brought in your local courts that have jurisdiction according to the statutory rules.</j1 /law1> (line 212).

<law1>Wenn Sie Ihren gewöhnlichen Aufenthalt in Deutschland haben, unterliegen diese Vereinbarung und Ihre Beziehung zu YouTube im Rahmen dieser Vereinbarung deutschem Recht unter Ausschluss des UN-Kaufrechts.</law1> <j1>Gerichtsverfahren können vor Ihren örtlichen Gerichten anhängig gemacht werden, die nach den gesetzlichen Regelungen zuständig sind.</j1> (line 208).

In this case, the English clause is formulated as one longer sentence which refers to both applicable law and jurisdiction, hence the tags are nested. By contrast, the corresponding clause in German is divided into two sentences, both of which are annotated under one category. The first sentence of the German ToS, concerning jurisdiction, was found on the list of errors.

Finally, in certain cases, only some of the resulting sentences in the target language are qualified for annotation while the remaining ones remain unmarked. To illustrate, consider the following example from the Polish version of Revolut ToS as compared to the English ToS (both updated October 31, 2021):

For example, you can do the following: send money to and receive money from other Revolut accounts and non-Revolut accounts; change money from one currency to another (we call this a currency exchange). <ch2>The currencies

available might change occasionally; make payments and withdraw cash using your Revolut Card; and view information about and manage your account.</ch2> (line 40).

<ch2>Możesz na przykład: przysyłać pieniądze na konta Revolut (i inne konta) oraz otrzymywać je z kont Revolut (i innych kont) innych osób; wymieniać pieniądze z jednej waluty na inną (nazywamy to wymianą walut); dostępne waluty mogą ulegać zmianie; dokonywać płatności i wypłacać gotówkę przy użyciu karty Revolut; oraz przeglądać informacje o swoim koncie i zarządzać nim.</ch2> (line 40).

Du kannst beispielsweise Folgendes tun: Geld senden und von anderen Revolut-Konten und Nicht-Revolut-Konten empfangen Geld von einer Währung in eine andere wechseln (wir nennen das einen Währungsumtausch). <ch2>Die verfügbaren Währungen können sich gelegentlich ändern.</ch2> mit deiner Revolut-Karte Zahlungen tätigen und Bargeld abheben und Informationen zu deinem Konto anzeigen und dieses verwalten. (line 40).

In the example above only the part on the changing availability of currencies is relevant for annotation while the relevant sentences in English, Polish and German are split in three different ways. Specifically, in Polish, a longer portion of the text had to be annotated compared to the source English version, while in German the opposite was true. As the error analysis revealed, the system failed to identify the Polish clause, yet a similar error did not exist for the German version.

### B.2.3 Mismatch in the ToS structure

The terms of Groupon International Travel contain significant discrepancies across language versions. As noted in Sect. 6, not only the division of sections but also the content of some terms appear to differ depending on the language version. Some of the clauses are only present in one version, while others are found in different sections of the contract. To illustrate these differences, consider the following sections from the German Groupon ToS (updated 13 May 2019), i.e., paragraphs 8.2–8.4, as compared to the English version (updated 9 February 2022).

#### 7. Groupon's Standards of Services and Liability

##### 7.1 Groupon promises that:

7.1.1 it will exercise reasonable care and skill in performing its obligations under these Terms of Sale;

7.1.2 the Vouchers are of satisfactory quality and fit for their purpose; and

7.1.3 it shall not contravene the requirements of fairness or professional diligence in what it does.

7.2 <ltid2>Groupon is always liable for: (a) death and personal injury caused by Groupon's negligence; (b) fraud or fraudulent misrepresentation made by itself; or (c) any implied contractual terms that cannot be excluded or limited under applicable law.</ltid2>

7.3 <lt2>Other than as set out in section 7.2 above, Groupon is not liable for any other losses or damages you may suffer, including any indirect or consequential losses.</lt2>

7.4 Groupon does not promise the completeness, fitness for purpose or legality of the Merchant Offering or the Groupon Shop Goods. <lt2>Groupon is not liable for the quality, safety, usability or any other aspect of the Merchant Offering or the Groupon Shop Goods.</lt2>

7.5 <lt2>Groupon is not liable for any breach of an obligation under these Terms of Sale where it is unable to carry out its obligations by any cause outside of its reasonable control.</lt2>

7.6 <lt2>Other than the liability arising under section 7.2, which is unlimited, Groupon's total liability to you will in no circumstances exceed the amount of 200% the purchase price of the Voucher.</lt2>

7.7 In certain countries applicable law does not allow some or all of the exclusions and/or limitations set out in this section 7. If these laws apply to you, some or all of the above exclusions and/or limitations may not apply to you and you may have additional rights.(line 662).

## 8. Gewährleistung / Haftung

8.1. Groupon gewährleistet, dass der Partner den Gutschein einlöst, d.h. der Partner den Vertrag zu den im Gutschein verbrieften Bedingungen abschließt, wenn Sie den Gutschein vor Vertragsschluss beim Partner vorlegen.

8.2 <lt2>Löst der Partner den Gutschein nicht ein, ohne dass dies der Kunde zu vertreten hat, beschränken sich hieraus etwa ergebende Ansprüche des Kunden gegen Groupon auf die Erstattung des Kaufpreises.</lt2> Die gesetzlichen Ansprüche des Kunden bei einer schuldhaften Pflichtverletzung durch Groupon bleiben unberührt.

8.3. <lt2>Groupon übernimmt keine Gewähr für die vom Kunden beim Partner erworbenen Produkte oder in Anspruch genommenen Dienstleistungen.</lt2> <lt2>Die in einem Gutschein verbrieft Leistung erbringt der jeweilige Partner gegenüber dem Kunden im eigenen Namen und auf eigene Rechnung, weshalb Groupon gegenüber dem Kunden für Pflichtverletzungen des Partners bei der Leistungserbringung nicht haftet.</lt2>

8.4. Kann der Gutschein aus unvorhergesehenen und von Groupon nicht zu vertretenden Gründen nicht oder nicht zu den ursprünglich vorgesehenen Bedingungen eingelöst werden, teilt Groupon dies dem Kunden unverzüglich per E-Mail mit und bietet ihm entweder einen neuen Gutschein mitvergleichbaren Leistungen (sofern verfügbar) oder die Rückzahlung des Kaufpreises an. <ter2>Sofern der Kunde das Angebot von Groupon nicht innerhalb der im Angebot mitgeteilten, angemessenen Frist annimmt, ist Groupon zum Rücktritt vom Vertrag berechtigt.</ter2> Der bereits geleistete Kaufpreis wird dem Kunden in diesem Fall unverzüglich erstattet. Die gesetzlichen Rechte der Vertragsparteien bleiben hiervon unberührt.

8.5. Sollte es bei der Einlösung des Gutscheins oder bei der Erbringung der Leistung zu Problemen kommen, wird Groupon versuchen, eine Lösung zu finden. In diesem Fall schreiben Sie uns bitte eine E-Mail an kontakt@groupon.de oder kontaktieren Sie uns telefonisch. (line 656).

Note that the liability sections in the two language versions are markedly differently. Moreover, in the German ToS, clauses from 8.2 to 8.4, marked as (potentially unfair) have not been identified by the system (false negatives). The same is true for another limitation of liability clause as well as one clause concerning unilateral change, having no equivalents in the English ToS.<sup>30</sup>

### B.2.4 Incorrect translation or linguistic choices

As noted in Sect. 6 incorrect translation and inappropriate linguistic choices may be due to (i) ambiguities in the source text; (ii) cultural differences; (iii) lack of context; or (iv) grammatical and syntax errors.

Concerning the presence of ambiguities in the source text, consider the borderline example provided by the following clauses from Western Union English ToS and its corresponding German version (both accessed in February 2022):

Western Union will use and process your personal information as described in Our Privacy Statement and you explicitly consent thereto. (line 158).

<pinc2>Western Union verwendet und verarbeitet Ihre persönlichen Daten in Übereinstimmung mit Unserer Datenschutzerklärung, der Sie hiermit ausdrücklich zustimmen.</pinc2> (line 158).

The English sentence was not marked under the privacy included category as it is not apparent that consent to the privacy policy is covered by the general consent to the terms of service. By contrast, the German clause clearly states that the user “hereby” consents to data processing. This seemingly minor language difference resulted in a different annotation choice, leading the system to misidentify the German clause.

Language cannot be accurately interpreted or translated without taking into account cultural and legal contexts. As an example, consider the following situation from the Terravision ToS (as accessed on 31 January 2021):

<ltid2>Terravision is not liable to passengers who did not reserve their trip.</ltid2>

Terravision non ha alcun obbligo nei confronti dei passeggeri che non hanno prenotato la corsa.

Here, a translation of the English term “to be liable” into the more generic Italian “avere obbligo” resulted not only in different annotation choices but also in a classification error.

<sup>30</sup> German version of Groupon ToS (updated 13 May 2019), lines 670 and 682.

Finally, as an example of an unusual linguistic choice consider the following clause from Tripadvisor ToS in English and Polish (as available in 2017):

<ter2>Any false or fraudulent reservation is prohibited, and any user who attempts such a reservation may have his or her TripAdvisor membership terminated.</ter2> (line 70).

<ter2>Niedozwolone jest dokonywanie rezerwacji z użyciem fałszywych lub oszukańczych danych, a użytkownik podejmujący taką próbę może zostać pozbawiony członkostwa w TripAdvisor.</ter2> (line 70).

The meaning of the clause is equivalent in both languages, thus leading to consistent annotations. However, the Polish clause does not refer to “termination”, but instead provides that the users can be “deprived of” membership. This kind of subtle linguistic choices made by the drafters may complicate the similarity assessment. Like in the example above, the clause was not classified as potentially unfair by the system.

### B.3 Method 3: training set translation to target languages

#### B.3.1 Incorrect choice of terms

As reported in Sect. 6, some of the errors may be linked to the incorrect choice of terms. To illustrate, consider the following clause from Grindr ToS, whose original English version (updated 13 March 2020) is formulated as follows:

<cr3 ter3>WE MAY DELETE YOUR SUBMISSIONS AND WE MAY BAN YOUR ACCOUNT.</ter3 /cr3> (line 41).

The clause was automatically translated in the following way:

MOŻEMY USUNĄĆ TWOJE ZGŁOSZENIA ORAZ ZABRONIĆ TWOJE KONTO.

The meaning of the object in the first part of the sentence (submissions) is not easy to establish without context. In this case, the term was automatically translated as "request" or "application". The human translation in the corresponding Polish version was more specific and referred to the "content published by the user".<sup>31</sup> Also the choice of the verb "zabronić" (to forbid) can be questioned, as it does not fit well with the object "konto" (account).

Incorrect choice of terms can, moreover, be linked to the use of specific legal terminology. Consider, for example, the clause from Twitch ToS whose English version (updated 1 January 2021) is formulated as follows:

<lt2>Twitch is not liable for any statements or representations included in User Content.</lt2> (line 152).

<sup>31</sup> Polish version of Grindr ToS (updated 1 April 2020), line 41.

The automatic translation produced the following result:

Twitch nie ponosi odpowiedzialności za jakiegokolwiek oświadczenia lub oświadczenia zawarte w treści użytkownika.

In this case, the translator was unable to distinguish between the two legally relevant notions of “statements” and “representations”. Instead, both of them were translated as “oświadczenia”.

The same was true for the previously mentioned clause in the Italian Terravision ToS, where the term “liability” was translated as a generic term “obbligo”.

### B.3.2 Grammatical and syntax errors

To illustrate the identified grammatical and syntax errors, consider the clause from PayPal ToS whose original English version (updated 14 September 2019) is formulated as follows:

<ter3 ch2 ltd2>The actions we may take include, but are not limited to, the following: Terminate this User Agreement, limit your account, and/or close or suspend your account, immediately and without penalty to us; Refuse to provide the PayPal services to you in the future; At any time and without liability, suspend, limit or terminate your access to our websites, software, systems (including any networks and servers used to provide any of the PayPal services) operated by us or on our behalf, your PayPal account or any of the PayPal services, including limiting your ability to pay or send money with any of the payment methods linked to your PayPal account, restricting your ability to send money or make withdrawals; Hold your money to the extent and for so long as reasonably needed to protect against the risk of liability.</ltd2 /ch2 /ter3> (line 859).

The automatic translation produced the following result:

Zu den Maßnahmen, die wir ergreifen können, gehören unter anderem die folgenden: Beenden Sie diese Benutzervereinbarung, schränken Sie Ihr Konto ein und/oder schließen oder sperren Sie Ihr Konto sofort und ohne Strafe für uns; Weigern Sie sich, Ihnen die PayPal-Dienste in Zukunft zur Verfügung zu stellen; Sie können jederzeit und ohne Haftung Ihren Zugriff auf unsere Websites, Software, Systeme (einschließlich aller Netzwerke und Server, die zur Bereitstellung von PayPal-Diensten verwendet werden), die von uns oder in unserem Namen betrieben werden, auf Ihr PayPal-Konto oder eines davon aussetzen, einschränken oder beenden die PayPal-Dienste, einschließlich der Einschränkung Ihrer Möglichkeit, mit einer der mit Ihrem PayPal-Konto verknüpften Zahlungsmethoden zu bezahlen oder Geld zu senden, die Einschränkung Ihrer Möglichkeit, Geld zu senden oder Abhebungen vorzunehmen; Bewahren Sie Ihr Geld in dem Umfang und so lange auf, wie dies vernünftigerweise erforderlich ist, um sich gegen das Haftungsrisiko abzusichern.

While the original English version lists measures that can be taken by the *service provider*, the German translation suggests that it is the *user* who can take relevant actions. The subject of the sentence was thus mistakenly changed in the process of translation.

A further example is provided by a clause from Revolut ToS (updated 31 October 2021) whose English version is formulated as follows:

<ch2>We'll only change these terms and conditions for the following reasons: if we think it will make them easier to understand or more helpful to you; to reflect the way our business is run, particularly if the change is needed because of a change in the way any financial system or technology is provided; to reflect legal or regulatory requirements that apply to us; to reflect changes in the cost of running our business; or because we are changing or introducing new services or products that affect our existing services or products covered by these terms and conditions.</ch2> (line 526).

The clause was automatically translated in the following way:

Zmieniamy niniejsze warunki tylko z następujących powodów: jeśli uważamy, że ułatwi to ich zrozumienie lub będzie dla Ciebie bardziej pomocne; odzwierciedlać sposób prowadzenia naszej działalności, zwłaszcza jeśli zmiana jest konieczna ze względu na zmianę sposobu dostarczania dowolnego systemu finansowego lub technologii; aby odzwierciedlić wymagania prawne lub regulacyjne, które mają do nas zastosowanie; odzwierciedlać zmiany w kosztach prowadzenia naszej działalności; lub ponieważ zmieniamy lub wprowadzamy nowe usługi lub produkty, które wpływają na nasze istniejące usługi lub produkty objęte niniejszymi warunkami.

In this case, the phrase “to reflect” should have been translated as “aby odzwierciedlić”. However, in the translated version the particle “aby” is missing in two cases, leading the sentence to be partly incomprehensible.

Finally, consider the following example, taken from the Yahoo ToS (updated January 25, 2022), and the corresponding Italian translation:

<ter2>After 30 days from the date of any unpaid charges, your fee-based Service will be deemed delinquent and we may terminate or suspend your account and fee-based Service for non-payment.</ter2> (line 143).

Trascorsi 30 giorni dalla data di eventuali addebiti non pagati, il Servizio a pagamento sarà considerato inadempiente e potremmo chiudere o sospendere il tuo account e il Servizio a pagamento in caso di mancato pagamento.

The correct translation of the English phrase “your fee-based Service will be deemed delinquent” should have been “l'Utente del Servizio a pagamento è ritenuto moroso”, rather than “il Servizio a pagamento sarà considerato inadempiente”. Thus, the subject of the sentence—being considered as a defaulter—should have been the user and not the Service.



### B.3.3 Incomplete translation

Finally, some limited errors can derive from incomplete translations, e.g. when the predicate is entirely missing from the translated sentence. To illustrate this issue, consider the following clause from the LinkedIn ToS (updated 11 August 2020) whose English version is formulated as follows:

<law2>For others outside of Designated Countries, including those who live outside of the United States: You and LinkedIn agree that the laws of the State of California, U.S.A., excluding its conflict of laws rules, shall exclusively govern any dispute relating to this Contract and/or the Services.</law2> (line 180).

The automated translation produced the following result:

Für andere außerhalb der bezeichneten Länder, einschließlich derjenigen, die außerhalb der Vereinigten Staaten leben: Sie und LinkedIn stimmen zu, dass die Gesetze des US-Bundesstaates Kalifornien, mit Ausnahme der Kollisionsnormen, ausschließlich alle Streitigkeiten im Zusammenhang mit diesem Vertrag und/oder die Dienste.

In this case, the predicate "to govern" is missing from the translated sentence, resulting in its partial incomprehensibility.

## B.4 Method 4: test set translation to English

### B.4.1 Incorrect choice of terms

As we reported in 6, one recurring type of mistake concerns the choice of terms when the same word in the target language can have multiple meanings depending on the context. As an example, consider the following clause from the Polish Yahoo ToS (updated 25 January 2022), which was correctly identified by Google, but not by Apache Joshua:

<ltid2>W pełnym zakresie dozwolonym przez prawo i z wyłączeniem sytuacji opisanych w sekcji 14 podmioty yahoo nie odpowiadają w przypadku jakichkolwiek sporów wynikających ze stosowania tych warunków lub usług ani powiązanych z nimi na jakąkolwiek kwotę wyższą niż uiszczone opłaty za usługi.</ltid2> (line 111).

The above sentence is a translation of the following clause in the English ToS (updated 25 January 2022):

<ltid2>To the fullest extent permitted by law and except as otherwise stated in section 14, yahoo entities are not liable in connection with any disputes that arise out of or relate to these terms or services for any amount greater than the amount you paid us for the services.</ltid2> (line 111).

Apache Joshua's translation of the sentence is as follows:

Fully permitted by law and except as described in section 14 do not correspond to any dispute yahoo operators resulting from the application of these conditions or services or their related to any amount paid higher than the fees for services.

In this context, the Polish verb “odpowiadać” can mean either “to (co)respond” (with something or to a question) or “to be responsible/liable” (for damage). The translation above refers to the former understanding, which distorts the meaning of the original sentence.

Consider, moreover, the following clause taken from the Italian WhatsApp ToS and its English version, as translated by Apache Joshua:

<ter2>Se l’utente viola i diritti di proprietà intellettuale altrui in modo chiaro, grave o ripetuto o nei casi in cui siamo obbligati dalla legge a procedere in questo modo, possiamo prendere misure in merito al suo account, ivi comprese la disattivazione o la sospensione dello stesso.</ter2> (line 77).

User infringes the intellectual property rights of others in a clear, serious or repeated or where we are obliged by law to proceed in this way, we can take measures with regard to its account, including the decommissioning or treatment has stopped. (line 77).

The original English version of the above sentence is as follows:

<ter2>We may take action with respect to your account, including disabling or suspending your account, if you clearly, seriously or repeatedly infringe the intellectual property rights of others or where we are required to do so for legal reasons.</ter2>. (line 77).

In the above example, the phrase “la disattivazione o la sospensione dello stesso” (its deactivation or suspension) were translated in an incomprehensible manner. The sentence also contains grammatical errors, referred to in the next subsection.

As regards Opus-MT, consider the following clause from the Polish Flo ToS (updated February 5, 2020):

<lt3>FIRMA I ŻADNA Z OSÓB TRZECICH WYMIENIONYCH W APLIKACJI NIE ODPOWIADAJĄ ZA JAKIEKOLWIEK SZKODY OSOBISTE, W TYM ŚMIERĆ, SPOWODOWANE PRZEZ TWOJE UŻYTKOWANIE LUB NIEWŁAŚCIWE KORZYSTANIE Z APLIKACJI.</lt3> (line 146).

The above sentence is a translation of the following clause in the English ToS (updated February 5, 2020):

<lt3>THE COMPANY, OR ANY THIRD PARTIES MENTIONED ON THE APP ARE NOT LIABLE FOR ANY PERSONAL INJURY, INCLUDING DEATH, CAUSED BY YOUR USE OR MISUSE OF THE APP.</lt3> (line 146).

Using Opus-MT, the sentence was translated as follows:

Company and validity of third parties listed in the application do not apply as any personal injury, in this death, prevented by your use or inappropriate use of the application.

The translation contains multiple errors, including in the predicate (“do not apply as” instead of “are not liable for”), which renders the clause incomprehensible.

#### B.4.2 Grammatical and syntax errors

Performance issues can moreover be linked to grammatical and syntax errors affecting different parts of speech, as illustrated by the following example from the German Yelp ToS (updated 27 November 2012):

`<use2>Ihnen ist bekannt und Sie stimmen zu, dass Sie durch Ihren fortgesetzten Zugriff auf die Seite oder deren Nutzung nach der Veröffentlichung der geänderten Bedingungen Ihr Einverständnis mit der Änderung erklären.</use2>` (line 14).

The corresponding clause in the English ToS (updated 27 November 2012) is formulated in the following way:

`<use2>You understand and agree that your continued access to or use of the Site after the effective date of modifications to the Terms indicates your acceptance of the modifications.</use2>` (line 14).

Apache Joshua’s translation of the sentence is as follows:

You know, and they agree that they, in their continued access to the side or their use after publication of the amended conditions its agreement with the amendment explained.

The above translation contains multiple errors, e.g. the noun is not aligned with the pronouns. Notably, while Google’s translation of this clause is certainly superior,<sup>32</sup> the corresponding system nevertheless failed to identify the clause correctly. /NEWBy contrast, the clause was correctly identified when employing Opus-MT.

Consider, moreover, the following clause from the Polish Electronic Arts ToS (updated May 17, 2018):

`<use2>KORZYSTAJĄC Z USŁUG EA, UŻYTKOWNIK AKCEPTUJE NINIEJSZE WARUNKI.</use2>`(line 7).

The above sentence corresponds with the following clause in the English ToS (updated April 17, 2018):

`<use2>BY USING EA SERVICES, YOU AGREE TO THESE TERMS.</use2>` (line 7).

<sup>32</sup> Using the Google system the sentence was translated as follows: "You understand and agree that by continuing to access or use the site after the changed terms are posted, you are declaring your consent to the change".

The automated Opus-MT translation is as follows:

USE OF EA SERVICES, THE USER TAKES INTO ACCOUNT THIS CONDITIONS.

In the above translation, the participle “korzystając” (“by using”) was not correctly recognized. In addition, the phrase “akceptuje” (accepts) was incorrectly translated as “takes into account”, which constitutes an incorrect selection of terms. Similar mistakes were not found in the Google translation of the clause.

### B.4.3 Incomplete translation

Another type of error is linked to incomplete translations, e.g. when the predicate is entirely missing from the translated sentence or parts of clauses are not translated at all. To illustrate this issue, consider the following example from the Polish WhatsApp ToS (updated 4 January 2021):

W związku z tym możemy co jakiś czas aktualizować Regulamin, tak aby należycie odzwierciedlał nasze Usługi i praktyki. (line 114).

The corresponding clause in the English ToS (updated 4 January 2021) is formulated in the following way:

<ch2>Therefore, we may need to update these Terms from time to time to reflect our Services and practices correctly.</ch2> (line 118).

The predicate “update” is missing from the clause translated by Apache Joshua, making the sentence unintelligible:

Therefore can every now and then, so that the updated rules of our services and duly reflect the practice.

For a similar type of error in German translation consider the following example from the TikTok ToS (updated July 2020):

<ch2>Darüber hinaus können wir diese Nutzungsbedingungen gegebenenfalls ändern, beispielsweise wenn wir Funktionalitäten der Dienste aktualisieren oder wenn rechtliche Änderungen vorliegen, die sich auf diese Nutzungsbedingungen oder die Dienste auswirken.</ch2>(line 72).

The sentence is a translation of the following clause in the English ToS (updated 4 January 2021):

<ch2>We may also amend these Terms from time to time, for instance when we update the functionality of the Services, or when there are regulatory changes that impact these Terms or the Services.</ch2> (line 72).

Similarly, in the sentence translated by Apache Joshua the predicate is not complete:

**Table 8** Additional performance details for all the considered languages and scenarios: TP stays for true positives, FP for false positives and FN for false negatives, summed up over the five folds. When translation is employed, (G) stands for Google Translate, (O) for Opus-MT, (J) for Joshua

Scenario	Lang	Training set	Test set	TP	FP	FN
1	DE	Original	Original	796	414	495
2	DE	Projected labels	Original	835	574	456
3	DE	Translated from EN (G)	Original	718	321	573
4	EN	Original	Translated to EN (G)	892	460	399
4	EN	Original	Translated to EN (J)	566	253	725
4	EN	Original	Translated to EN (O)	919	519	372
1	IT	Original	Original	828	471	545
2	IT	Projected labels	Original	822	520	551
3	IT	Translated from EN (G)	Original	776	388	597
4	IT	Original	Translated to EN (G)	848	423	525
4	IT	Original	Translated to EN (J)	621	320	752
4	IT	Original	Translated to EN (O)	888	436	485
1	PL	Original	Original	845	485	525
2	PL	Projected labels	Original	862	570	508
3	PL	Translated from EN (G)	Original	728	308	642
4	PL	Original	Translated to EN (G)	872	462	498
4	PL	Original	Translated to EN (J)	588	351	782
4	PL	Original	Translated to EN (O)	732	448	638

Also we can, for example, if we amend conditions of service or legal changes if update functionalities based on these conditions or have been made to the services.

Finally, as an example of untranslated parts of sentences consider the following clause taken from the Italian Klarna ToS and its English version as translated by Apache Joshua (update September 15, 2021)):

<use2>Registrandoti per usufruire dei Servizi, stipuli un accordo con Klarna accettando questi termini.</use2>(line 5).

Registrandoti for repair services, enteri into a agreement with these terms. Klarna accepting. (line 5).

In the case above, the missing translation of “Registrandoti” obscures the condition under which the user’s consent is assumed. Moreover, the clause is broken into two separate sentences, making its meaning unintelligible.

## C Additional error analysis

As additional information with respect to the computational experiments reported in Sect. 5, in Table 8 we report also the raw counts on false positives, false negatives and true positives for the three considered languages. Such counts are obtained by summing up these quantities over the five folds, for each considered scenario.

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