## **GlotLID: Language Identification for Low-Resource Languages**

Amir Hossein Kargaran\*, Ayyoob Imani\*, François Yvon† and Hinrich Schütze\*

\*Center for Information and Language Processing, LMU Munich, Germany

Munich Center for Machine Learning (MCML), Germany

†Sorbonne Université, CNRS, ISIR, France

amir@cis.lmu.de

#### **Abstract**

Several recent papers have published good solutions for language identification (LID) for about 300 high-resource and medium-resource languages. However, there is no LID available that (i) covers a wide range of low-resource languages, (ii) is rigorously evaluated and reliable and (iii) efficient and easy to use. Here, we publish GlotLID-M, an LID model that satisfies the desiderata of wide coverage, reliability and efficiency. It identifies 1665 languages, a large increase in coverage compared to prior work. In our experiments, GlotLID-M outperforms four baselines (CLD3, FT176, OpenLID and NLLB) when balancing F1 and false positive rate (FPR). We analyze the unique challenges that low-resource LID poses: incorrect corpus metadata, leakage from high-resource languages, difficulty separating closely related languages, handling of macrolanguage vs varieties and in general noisy data. We hope that integrating GlotLID-M into dataset creation pipelines will improve quality and enhance accessibility of NLP technology for low-resource languages and cultures. GlotLID-M model, code, and list of data sources are available: https: //github.com/cisnlp/GlotLID.

#### 1 Introduction

The NLP community should create technology that covers as many languages as possible, not only medium-resource and high-resource languages. This goal can only be achieved if corpora for low-resource languages are available. Web-mined datasets – including CC100 (Wenzek et al., 2020), mC4 (Xue et al., 2021) and OSCAR (Abadji et al., 2021; Ortiz Suárez et al., 2019) – have made important contributions to low-resource NLP. In particular, they lay the ground for multilingual neural models like XLM-R (Conneau et al., 2020), mT5 (Xue et al., 2021) and Glot500 (ImaniGooghari et al., 2023). However, existing web-mined datasets have systematic quality issues (Kreutzer et al., 2022) and

insufficient coverage of low-resource languages.

Low-quality datasets cause poor performance for downstream applications. They can also give rise to a misleading perception of progress when coverage of a low-resource language is claimed based on noisy data. NLP for low-resource languages requires high-quality datasets and high-quality datasets require high-quality LID (language identification). For this reason, high-quality LID for low-resource languages is paramount. To address this need, in this paper we present GlotLID-M, a high-quality LID that covers 1665 languages. We use ISO 639-3 to individuate languages.

When expanding the scope of LID from a few hundred to 1665 languages, the problem of *granularity* becomes severe. In real-world settings, LID needs to support both macrolanguages and their varieties; it also needs to be robust against out-of-model cousins (Caswell et al., 2020; Kreutzer et al., 2022). We pay particular attention to this issue.

While low-resource is our main focus, Blevins and Zettlemoyer (2022) point out that low-quality LID also affects high-resource corpora through contamination, resulting in claims of successful crosslingual transfer that are due to unrecognized coverage of low-resource languages. We also address this issue, e.g., we improve English F1 on the "Universal Declaration of Human Rights" corpus (UDHR) to .85 compared to .43 for OpenLID.

Contributions. (i) We curate GlotLID-C, a comprehensive dataset covering 1665 languages, most of them low-resource, from a diverse set of domains. (ii) We train GlotLID-M on GlotLID-C, an open-source LID covering these 1665 languages. (iii) In our experiments, GlotLID-M outperforms several baselines by more than 12% absolute F1 on UDHR, which we take as the best benchmark for our focus on low-resource languages. (iv) When balancing F1 and false positive rate (FPR), GlotLID-M also outperforms baselines on FLORES-200, which is dominated by high-

/medium-resource languages.

## 2 Requirements for low-resource LID

Main use case: Corpus creation. Corpus creation and cleaning is the main use case for our low-resource LID because we want to address the need for high-quality corpora for low-resource languages. Line-by-line LID filtering is an effective method for achieving high corpus quality. Reliable LID can eliminate various types of noise (see (Caswell et al., 2020; Kreutzer et al., 2022)) – including data from other languages and nonlinguistic data – that is frequent, especially in web-crawled content. By adjusting the confidence threshold, users will have control over the level of quality of the corpora they create.

Broad coverage of languages, minimize out-ofmodel cousin errors. We strive for as broad a coverage as is possible given available datasets. This has two benefits. First, it reduces "out-of-model cousin" errors (Caswell et al., 2020; Kreutzer et al., 2022), i.e., it reduces the risk that a language not covered is misclassified as a closely related covered language. Second, having LIDs that discriminate many low-resource languages is a pre-requisite for developing NLP technologies for the largest possible number of languages. Yet many existing LIDs only cover a few hundred languages. In this study, we therefore focus on LIDs having a broad coverage, excluding CLD2 (McCandless, 2010), Equilid (Jurgens et al., 2017), Langdetect (Shuyo, 2010) and langid.py (Lui and Baldwin, 2012). These LIDs cover less than 100 languages or are outperformed by the models we compare with.

**Open-source.** LIDs should be open-source to encourage open collaboration and conform to best research practices. Some LIDs that meet our other requirements are not open-source, e.g., those published by Caswell et al. (2020), Bapna et al. (2022) and Kudugunta et al. (2023). CLD3 (Botha et al., 2017; Salcianu et al., 2018) is freely available, but its training code is not open-source.

**Ease of use.** LIDs should be easily deployable across platforms and programming environments without having to worry about dependencies, compatibility and lack of maintenance.

Because of this ease-of-use requirement, we do not consider whatlang (Brown, 2014b,a) nor idNet (Dunn, 2020), two broad-coverage LIDs that meet many other requirements, but are hard to use in many practical scenarios due to software issues

and lack of maintenance.

Uncertainty assessment. In our use cases, we would like to rely on uncertainty measures to distinguish cases where the highest-probability language is certain from those where it is not. This would allow us to choose a level of confidence for the resulting corpus. For example, we may want to retain only sentences identified with a high confidence (say, 70%). This is essential to produce high-quality low-resource corpora.

Because of this requirement, we do not consider Franc (Wormer, 2014) as a baseline. While it has many desirable properties, it generally does not provide well-calibrated probabilities. It usually returns several classes, giving 1.0 to the top class and values close to 1.0 to several others.

**Efficiency.** LID is easy to run in parallel, but we still need an efficient solution to make it applicable to large corpora, not least for ecological reasons.

Lack of efficiency is the reason why we do not use AfroLID (Adebara et al., 2022) as a baseline, despite its excellent coverage of African languages. AfroLID is a transformer architecture and less efficient than its competitors.

Granularity flexibility. When scaling LID from a few hundred languages to more than 1500, it is hardly practical to restrict the set of labels to a single level of the language hierarchy (e.g., using resources like https://iso639-3.sil.org). This is due to the complexity of defining and delimiting languages, including the coexistence of macrolanguages and their varieties. In many cases, we want to keep both the macrolanguage and the varieties in our label set because the varieties we have data for are important languages in their own right. But for other varieties, we do not have variety-labeled data, so the only way to include them is through the macrolanguage. For example, FLORES-200 (NLLB Team et al., 2022) covers the macrolanguage aka (Akan) and its variety twi (Twi), but not its variety fat (Fanti). Keeping both aka and twi gives flexibility to LID users: they can either differentiate aka and twi or they can consolidate the two labels to the single label aka, depending on what makes more sense in their setting.

## 3 Dataset curation

We now describe GlotLID-C, a corpus for LID training that covers 1832 languages.

<sup>&</sup>lt;sup>1</sup>It has no coverage of other low-resource languages.

**Source selection.** We choose sources that we deem trustworthy (i.e., high chance of correct language label). To address the domain sensitivity of LID and broaden language coverage, we curate a diverse set of text domains.

We review sources referenced by ImaniGooghari et al. (2023); Burchell et al. (2023); Blaschke et al. (2023); Adebara et al. (2022); Adebara and Abdul-Mageed (2022). In each case, we consider the collection methodology, selecting sources whose language labels are trustworthy. We generally do not use web-crawled sources to avoid the associated problems (Kreutzer et al., 2022). Most selected sources are derived from Wikipedia, religious texts, collaborative translations, storybooks, and news sites. This gives us a coverage of 1832 languages, more than any other public LID. For a list of data sources, see §A.

**Preprocessing.** We ensure that each sentence is written in the correct script, based on the writing system databases of Kargaran et al. (2023) and van Esch et al. (2022). We use the GlotScript (Kargaran et al., 2023) Python library to determine scripts.<sup>2</sup> We also eliminate duplicate sentences.

**Statistics.** Our final corpus, GlotLID-C, comprises 289 million sentences (i.e., lines of data) totaling 40GB and spans 1832 languages (identified by their ISO 639-3 code). 1677 languages have more than 1000 sentences. Refer to \$D for the total number of sentences per language.

**Train/test split.** We designate 85% of the data as **GlotLID-C train**. Let  $n_l$  be the number of sentences from language l in the remaining 15%. Then we sample  $\min(1000, n_l)$  sentences from it. We refer to the resulting dataset as **GlotLID-C test**.

**Contamination.** To make sure our evaluation data (especially UDHR, refer to §5.1) do not overlap with our sources, we compute contamination of UDHR in GlotLID-C train.

We count a UDHR test sentence as occurring in the training set if all of its word four-grams occur in one sentence of GlotLID-C. Most of these contaminations are due to two resources: Wikipedia and Tatoeba.<sup>3</sup> GlotLID-C train shares 374 languages with UDHR.

For 292 languages, we find that none of the UDHR test sentences occurs in the training data. For 57 languages, less than 10% of UDHR test sentences occur in the training data. The remaining

25 languages with a contamination rate over 10% are all high/medium resource languages.

In our experiments, we decided against removing any sentences from GlotLID-C, as there is little contamination of UDHR for low-resource languages. We follow here most prior work which has the problem of contamination of UDHR for high-resource languages. We will however remove from GlotLID-C train the sentences causing contamination as part of our next release.

#### 4 GlotLID-M

We select FastText (Joulin et al., 2017) as the architecture for GlotLID-M, because it satisfies all requirements outlined in §2 as we will explain now.

We train our FastText model GlotLID-M on GlotLID-C train with 1832 languages. FastText can easily handle the large number of languages in the corpus. Because of this **broad coverage**, **out-of-model cousin errors are reduced**. Although we restrict the number of classes to 1665 for some experiments (e.g., in Table 1), GlotLID-M's classification always uses all 1832 languages to mitigate out-of-model cousin errors. This satisfies the first requirement from §2: GlotLID-M is a useful tool for corpora creation because it has a broad coverage of languages that can occur in raw data.

FastText provides an **open-source** codebase for training, which supports customization and extension of GlotLID-M.

FastText is **easy to use**: It offers a number of language bindings, making it compatible with multiple programming languages (including C++, Python, Java, Node.js, Rust, Ruby, R) and reducing dependency, incompatibility and other software issues.

FastText meets the requirement of **uncertainty** assessment because it provides confidence scores that can serve as thresholds to effectively mitigate noise in the data. For the same reason, FastText also supports **granularity flexibility**: we can accumulate probabilities over language varieties to get a good estimate of the probability of the macrolanguage. To this end, we simply add to the macrolanguage probability the probabilities of its varieties. This way, the system can return appropriate estimates at various levels of granularity.

As a professionally designed and implemented linear classifier, FastText is **efficient**: it had the best throughput of the candidate solutions we tested and can process large corpora with high speed. As a linear model, FastText has the additional advantage

<sup>2</sup>https://github.com/cisnlp/GlotScript

<sup>3</sup>https://tatoeba.org/en/downloads

of delivering explainable classification decisions. FastText is a multinomial logistic classifier. The input sentence is represented as an average of n-gram embeddings. This allows us to visualize how much each n-gram contributed to the final prediction. See NLLB Team et al. (2022), Fig. 8, for details.

Taking all these requirements together (and its good LID performance demonstrated in §6 and acceptable calibration in §F), GlotLID-M, based on FastText, is, in our opinion, an excellent tool for supporting our use case, the **creation of high-quality low-resource corpora**.

## 5 Experimental setup

We train GlotLID-M on GlotLID-C train using the hyperparameters in (NLLB Team et al., 2022; Burchell et al., 2023) and otherwise FastText defaults (see §B). Following Arivazhagan et al. (2019), NLLB Team et al. (2022) and Burchell et al. (2023), we perform up-sampling for low resource languages. Sentences from a language l representing  $p_l$  of the dataset are sampled proportionally to  $p_l^{\frac{1}{T}}$  where T is the temperature. Following NLLB Team et al. (2022) and Burchell et al. (2023), we set  $\frac{1}{T}=.3$ .

#### 5.1 Evaluation data

We evaluate GlotLID-M on GlotLID-C test, FLORES-200 (NLLB Team et al., 2022) and UDHR<sup>4</sup> (Universal Declaration of Human Rights).

While testing on data unseen in training is standard in NLP, the results have to be taken with a grain of salt because there is often a domain mismatch in real-world applications of LID (Caswell et al., 2020; Dunn, 2020). FLORES-200 and UDHR address this concern: they are not part of our training set (however, see discussion in §3) and do not draw on our sources. Many other benchmarks share sources like Wikipedia with us (Thoma, 2018; Haas and Derczynski, 2021; Ahmadi et al., 2023). FLORES-200 and UDHR are also the benchmarks with the broadest available language coverage.

**FLORES-200** is a collection of 842 articles obtained from English-language Wikimedia projects. Each sentence in the articles was translated into 204 distinct language-script combinations, corresponding to 196 distinct languages, and human-verified. It provides 997 sentences for development, 1012 for dev-test and 992 for test. FLORES-200 test is

not publicly available. Following prior work, we use dev-test as our FLORES test set.

The level of granularity across language (sub)families varies in FLORES; e.g., it includes nine varieties of Arabic. On the other hand, some languages (e.g., est:Estonian) are only available as macrolanguage. In some cases, FLORES includes both a macrolanguage and varieties, e.g., aka (Akan) and its variety twi (Twi), and zho (Chinese) and its variety yue (Yue Chinese). Although some issues have been reported (see §C.1) with FLORES, we do not have the resources to investigate them, so we use it as is.

**UDHR** consists of more than 500 translations of the "Universal Declaration of Human Rights". 419 translations available from the "UDHR in Unicode" project have a iso-639-3 code that is not "und" (undetermined). We discard short sentences (e.g., consisting of just an article number or the single English word 'missing') by discarding the 35% shortest sentences for each language.

In some cases (e.g., Zulu and Quechua), UDHR contains both a macrolanguage and one of its varieties. We have also seen some issues in UDHR (see §C.2), but we have not extensively investigated these potential problems.

## 5.2 Baselines

Our baselines are FT176,<sup>5</sup> CLD3, NLLB (NLLB Team et al., 2022) and OpenLID (Burchell et al., 2023). The first two were used for filtering the resources OSCAR and mC4 (Kreutzer et al., 2022).

**CLD3.** CLD3 uses an n-gram  $(1 \le n \le 3)$  based neural network model. CLD3 sometimes deviates from established metadata conventions. For example, ISO-639-1 ku refers to kur (Kurdish), but in CLD3 ku refers to its variety kmr (Northern Kurdish). It refers to Hebrew as iw, but the ISO code for Hebrew has changed to he and heb.

**FT176.** FT176 is a FastText model that uses Wikipedia (WP) codes as labels. The documentation of language metadata is sometimes unclear; e.g., FT176 refers to Alemannic German as als although ISO-639-3 als is Tosk Albanian. It refers to the Malay macrolanguage as ms, but unlike ISO-639-3, this does not include ind (Indonesian).

**NLLB and OpenLID.** NLLB and OpenLID are FastText models. Their language label sets are mostly taken from FLORES, so granularity and coverage are similar to FLORES.

<sup>4</sup>http://www.unicode.org/udhr/d/

<sup>5</sup>https://fasttext.cc/docs/en/ language-identification.html

#### **Decision rule**

Given an LID classifier m, a base set B of languages and a threshold  $\theta$ , we assign label  $\phi(s, m, B, \theta)$  to sentence s as follows:

$$\phi(s, m, B, \theta) = \begin{cases} \text{undetermined} & \text{if } \max_{l \in B} P_m(l|s) < \theta \\ \operatorname{argmax}_{l \in B} P_m(l|s) & \text{otherwise} \end{cases}$$

We distinguish two scenarios: SET! and SET?.

In scenario SET!, the set of languages covered by the evaluation benchmark is known. We restrict a model's predictions to those languages that occur in the benchmark. This means that B is a (proper or improper, see table captions for details) subset of the languages occurring in the benchmark.

In scenario SET?, the set of languages covered by the evaluation benchmark is not known. We do not restrict a model m's predictions: the model considers the entire set of languages it was trained on. This means that B is the set of languages that m was trained on.

Figure 1: Decision rule for assigning classes (i.e., languages) in language identification

Language metadata matching. Matching the metadata of the models to the metadata of the benchmarks (FLORES, UDHR, GlotLID-C) is not easy. First, models do not consistently adhere to standard language codes. In addition, differences in granularity require matching rules. For example, if a benchmark only covers a macrolanguage and none of its varieties, then we consolidate classification decisions for the macrolanguage and its variations into the macrolanguage label. See §E for details on metadata matching.

Confidence thresholds. For CLD3, we use .5 and .7, the two preset thresholds in Google's CLD3 repository. For the other three baselines and GlotLID-M, we also use .5, but we use .3 as the second threshold value because .7 severely reduces the number of positive predictions for the FastText models, resulting in low F1.

Prior work has not systematically investigated the effect of confidence thresholding. However, it is of key importance for our use case of creating high-quality corpora for low-resource languages. See §5.3 and §6 for discussion of this point.

## 5.3 Decision rule

Figure 1 defines our decision rule.

**SET! scenario.** When comparing LIDs  $m_1$  and  $m_2$  (trained on the set of languages  $M_1$  and  $M_2$ ) on a benchmark T (supporting the set of languages B(T)), many evaluations create a subset  $M_1 \cap M_2 \cap B(T)$  and remove all sentences in the benchmark that are labeled with languages outside of  $M_1 \cap M_2 \cap B(T)$ . SET! evaluation replicates this standard way of evaluating LIDs.

**SET? scenario.** We believe that the SET! scenario makes the LID task unrealistically easy: a portion of the data that could give rise to false positives (data not in  $M_1 \cap M_2 \cap B(T)$ ) is removed.

It is particularly unrealistic for our low-resource scenario. Instead of hundreds of languages that are not supported by all models, we have more than a thousand. We therefore run evaluations on the data *for all languages* – not just for  $M_1 \cap M_2 \cap B(T)$ . That is, we run evaluations on the entire benchmark T, not on the subset in  $M_1 \cap M_2 \cap B(T)$ . This is the SET? setting in Table 2 where SET? signifies that the LID is not given prior knowledge about which languages occur in T. For example, for the comparison of CLD3 and GlotLID-M on FLORES in the top part (SET?) of Table 2, both CLD3 and GlotLID-M are run on the entire FLORES test set. We do not exclude the languages that are present in T, but are not part of  $M_{\text{CLD3}} \cap M_{\text{GlotLID}}$ , i.e., the languages outside of the set of 95 languages common to CLD3 and GlotLID-M.

**Macro average.** For a fair comparison to prior work, we restrict the macro average over languages to a subset of languages in order to replicate the experimental setup of this prior work. This subset is indicated in the tables.

Realistic evaluation for low-resource scenar**ios.** We believe that our new evaluation setup SET? better approximates real world situations. In cleaning pipelines, LID models are often presented with an unknown set of languages without prior knowledge. Therefore, it is crucial for an LID to have the capacity to handle unknown languages. This can be achieved by setting a threshold  $\theta$  on the confidence scores. If the confidence score for a predicted label falls below the threshold, the model should label the input text as "undetermined". This reduces the risk of languages unknown to the model being incorrectly categorized as a known language (the out-of-model problem). Consequently, when comparing LIDs, it is necessary to apply each model to the entire benchmark.

			GlotLID-M, $\theta$ =.0		GlotLl	ID-M, $\theta$ =.5
Benchmark		L	<b>F1</b> ↑	FPR↓	F1↑	FPR↓
GlotLID-C	all	1832	.940	.0005	.938	.0003
GlotLID-C	subset	1665	.977	.0003	.973	.0002
UDHR	all	374	.750	.0015	.734	.0007
UDHR	subset	342	.784	.0014	.770	.0006
FLORES-200	all	196	.917	.0042	.887	.0013
FLORES-200	subset	177	.957	.0029	.924	.0010

Table 1: Performance of GlotLID-M on GlotLID-C, UDHR and FLORES-200 test sets. Subset: restriction to an "operational" subset of languages that are either high-resource or for which GlotLID-M achieves  $F1\neq 0$  and  $FPR\leq .0005$  on GlotLID-C test. L: intersection of GlotLID-M languages (all: 1832 or subset: 1665) and languages present in benchmark. Referring to Figure 1, the size of the base set B is either 1832 (all) or 1665 (subset). L is the set of languages over which the macro average is computed. For example, for the last line (FLORES-200 subset), B consists of 1665 languages and the reported macro averages are computed over 177 languages.

#### 5.4 Evaluation measures

Unlike some older prior work (Jauhiainen et al., 2019b), we do not use accuracy because classes are highly imbalanced. Instead, we follow recent prior work (NLLB Team et al., 2022; Burchell et al., 2023) and use F1 and false positive rate (FPR). F1 is an aggregate measure of precision and recall, both of which are important: we want accurate classifications decisions (precision) and we do not want to lose too much data (recall). FPR is defined as  $FPR = \frac{FP}{FP+TN}$ , where FP is the number of false positives, and TN is the number of true negatives. FPR helps us assess the potentially fatal effect of an even low false positive rate when the negative class is huge – which is the case in our scenario. For example, an FPR of .01 (which prima facie may seem ok) for a language l with base frequency .01 can result in a corpus for l that contains 50% noise, an unacceptably high level.

## 6 Results

Table 1 gives results on GlotLID-C test, UDHR and FLORES-200. GlotLID-M does not perform well on some languages. In particular, there are 167 (1832-1665) low-resource languages for which either F1<.01 or FPR>.0005, often due to very small GlotLID-C training sets. The table gives results for "all" 1832 languages as well as for the "subset" of 1665 well-performing languages. We run GlotLID-M in two settings:  $\theta$ =.0 (i.e., we choose the highest probability class no matter how low its

probability is) and  $\theta=.5$  (i.e., we only assign a language label if its probability exceeds .5). See Figure 1 for the definition of our decision rule.

Focusing on the "subset" results for  $\theta = .5$ , F1 is .973 on GlotLID-C and .924 on FLORES; and FPR is .0002 on GlotLID-C and .0010 on FLORES. This is a very good performance, in particular for the use case of low-resource corpus creation because low FPR means that the resulting corpora will be less contaminated. On UDHR, again for the "subset" results for  $\theta = .5$ , F1 is .770 and FPR .0006. This is again an encouragingly low FPR, but F1 is quite a bit lower than for GlotLID-C and FLORES. The reason is that we have a domain shift (compared to GlotLID-C) and many more languages (compared to FLORES), resulting in lower F1. Although the UDHR results should be improved further, we will now show that they outperform the state of the art.

Table 2 compares GlotLID-M with four baselines. We consider two evaluation settings (SET? and SET!) and three thresholds  $\theta$ . The top part of the table (SET?) corresponds to the case where the set of languages in the benchmark is not known, i.e., the LID makes predictions for all languages it was trained on. In contrast, in the SET! setting (bottom part), the set of languages in the benchmark is known, and each LID only makes predictions for those languages. SET? is a more realistic setting, as we usually do not know which languages occur in a corpus that needs to be cleaned.

For the SET? setting, GlotLID-M consistently outperforms CLD3 by a large margin. Taking into account that F1 and FPR should be balanced, we also take it to outperform FT176. Even though GlotLID-M's FPR is slightly higher in some cases, its F1 is better by a large margin, so that it is clearly the better performing system.

On UDHR, GlotLID-M also clearly outperforms OpenLID and NLLB for F1 and FPR by large margins. On FLORES, F1 is slightly worse and FPR slightly better compared with OpenLID and NLLB. We point out that this comparison is not entirely fair since OpenLID and NLLB were designed with FLORES in mind. More importantly, our use case is the creation of low-resource corpora for which UDHR is the more appropriate benchmark.

Comparing results for different thresholds, we observe that increasing  $\theta$  lowers F1 (because recall is hurt) and lowers FPR (because precision is increased). This suggests that a higher threshold should be used since lower FPR will result in

						FLOR	ES-200	)						UD	HR			
			CI	LD3	FT	176	Ope	nLID	NI	LLB	CI	LD3	FT	176	Ope	nLID	NI	LLB
			L	= 96	L	= 108	L	= 195	L	= 188	L	= 100	L	= 124	L	= 159	L :	= 172
	LID Model	$\theta$	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
	baselines	.0	.753	.0098	.775	.0090	.923	.0051	.947	.0053	.544	.0099	.566	.0079	.645	.0056	.641	.0051
	baselines	$\theta_1$	.779	.0081	.816	.0033	.923	.0050	.948	.0051	.576	.0081	.644	.0025	.676	.0046	.677	.0040
3T?	baselines	$\theta_2$	<u>.799</u>	.0060	.796	.0021	.923	.0044	.947	.0047	<u>.618</u>	.0060	<u>.647</u>	.0014	<u>.718</u>	.0034	.717	.0030
SE	GlotLID-M	.0	.978	.0051	.987	.0042	<u>.916</u>	.0043	.947	.0035	.868	.0033	.868	.0030	.848	.0020	.847	.0019
	GlotLID-M	.3	.980	.0042	.987	.0037	.898	.0020	.927	.0019	.881	.0028	.879	.0026	.846	.0015	.844	.0015
	GlotLID-M	.5	.980	.0031	.987	.0029	.886	.0014	.916	.0013	.903	.0023	.890	.0021	.847	.0012	.846	.0011
Ë	baselines	.0	.952	.0104	.881	.0093	.923	.0051	.950	.0053	.922	.0101	.739	.0081	.881	.0063	.854	.0058
SE	GlotLID-M	.0	.983	.0104	.991	.0093	<u>.922</u>	.0051	.954	.0053	.952	.0100	.927	.0081	.926	.0064	.925	.0060

Table 2: Evaluation of LID performance. Top ("SET?"): The set of languages is not known, i.e., each LID makes predictions for all languages it was trained on. Bottom ("SET!"): The set of languages is known: each LID only makes predictions for languages that occur in the benchmark. For the more realistic "SET?" setting, GlotLID-M outperforms the baselines on UDHR (which we take to be the best benchmark for the low-resource case) assuming a good tradeoff between FPR and F1 is desired; it either matches or outperforms them on FLORES. Let  $M_i$  be the set of languages model  $m_i$  was trained on and B(T) the set of languages covered by benchmark T. Then F1 and FPR are averages over  $L = M_1 \cap M_2 \cap B(T)$  when comparing models  $m_1$  and  $m_2$ ; this is indicated in the third row of table, e.g., |L| = 96 for  $m_1 = \text{CLD3}$ ,  $m_2 = \text{GlotLID}$ .  $\theta_1$ =.5 for CLD3,  $\theta_1$ =.3 for FT176, OpenLID and NLLB.  $\theta_2$ =.7 for CLD3,  $\theta_2$ =.5 for FT176, OpenLID and NLLB. Referring to Figure 1, the base set B in SET? has size 103 for CLD3, 176 for FT176, 195 for OpenLID, 211 for NLLB and 1832 for GlotLID-M (i.e., the languages the LID was trained on). For scenario SET!, B = L, i.e.,  $B = M_1 \cap M_2 \cap B(T)$ . For example, |B| = 96 (for both CLD3 and GlotLID) for the four cells in the the SET! rows and the CLD3 columns in the lower left corner of the table. The best result in each column is **bolded**, and the second-best result is underlined.

low-resource corpora with less contamination from high-resource languages.

For the less realistic SET! setting, GlotLID-M performs better than CLD3 and FT176 and comparably to OpenLID and NLLB. Overall, GlotLID-M clearly outperforms all baselines for the low-resource corpus creation use case.

To analyze variance of results, we ran three GlotLID experiments with different initial seeds on the 200 languages with the most data, splitting the data into 80% train and 20% test. The F1 score was .991 each time. This indicates that the variance of FastText in this task (and by extension GlotLID) is negligible.

## 7 Analysis

In this section, we analyze the GlotLID-M results summarized in Table 1 ( $\theta$ =.0, "all") for our main use case, the creation of high-quality corpora. We address four questions. (i) For which languages do we get a high number of false positives? (ii) For which languages do we produce a corpus with a high contamination rate? (iii) For which languages does learning completely fail? (iv) Is it more realistic to evaluate LID on a balanced test set (as in prior work) or on one that is skewed in favor of high-resource languages?

**Most errors.** We first analyze languages with a high number of errors. Table 3 (top, "most er-

rors") gives for each of the three benchmarks the five languages that have the highest number of errors (column "language"). "FP" is the number of false positives, "cl" the ratio of true positives to all positives (that is the "cleanness" of the corpus), "top FP source" the language that contributed most of the errors and "%" is the portion of these false positives as a percentage of all false positives. We use the cl measure in our analysis because it is ultimately the measure we want to optimize to produce high-quality low-resource corpora. Note that cl (the denominator is the total number of positive sentences) is not directly related to FPR (the denominator is the number of sentences that do not belong to the language). cl is a more direct measure of the utility of the resulting corpus of a low-resource language (e.g., for training a language model) than FPR.

Most of the fifteen pairs of "conflated" languages shown in the table are closely related languages: varieties of Arabic (Standard, Najdi, Egyptian and Levantine), Persian (Iranian, Dari), Chinese (Mandarin, Yue, Wu, Hakka), English (Standard, Liberian), Quechua (Huallaga Huánuco, Huamalíes-Dos de Mayo Huánuco), Finnic (Finnish, Karelian), Slavic (Russian, Church Slavic), Bihari (Bihari, Bhojpuri) and Hindi (Standard, Awadhi). In many of these cases, speakers of one variety of the pair also have good knowledge

	I	FLORES-200	ĺ		1	UDHR			GlotLID-C	
	language	FP cl top FP source	#FP %	language	FP	cl top FP source	#FP %	language	FP cl top FP source	#FP %
most errors	arb:St Arabic arz:Egyptian Ar pes:Ir. Persian cmn:Mandarin Ch hin:Hindi	3787 .18 ars:Najdi Arabi 1726 .32 apc:Levantine A 1495 .40 prs:Dari 1008 .00 yue:Yue Chinese 977 .51 awa:Awadhi	829 .22 440 .25 905 .61 1008 .99 693 .71	cmn:Mandarin Ch qub:Huallaga Hu fin:Finnish wuu:Wu Chinese rus:Russian	247 224 172	.38 chr:Cherokee .00 qvh:Huamalíes-D .22 krl:Karelian .24 hak:Hakka Chine .28 niv:Gilyak	81 .14 55 .22 138 .62 44 .26 44 .28	spa:Spanish eng:English rus:Russian bho:Bhojpuri lir:Liberian En	1952 .34 pid:Piaroa 1168 .46 lir:Liberian En 1057 .49 chu:Church Slav 882 .50 bih:Bihari Lgs 712 .47 din:Dinka	156 .08 254 .22 661 .63 854 .97 174 .24
most noisy	arb:St Arabic arz:Egyptian Ar prs:Dari dyu:Dyula apc:Levantine A	3787 .18 ars:Najdi Arabi 1726 .32 apc:Levantine A 338 .24 pbt:S Pashto 255 .25 bam:Bambara 161 .42 ajp:S Levantine	829 .22 440 .25 310 .92 255 .99 70 .43	evn:Evenki quz:Cusco Quech hrv:Croatian tzm:C Atlas Tam uzn:N Uzbek	36 82 84 52	.23 oaa:Orok .40 qxu:Arequipa-La .42 bos:Bosnian .02 zgh:St Moroccan .46 cbu:Candoshi-Sh	19 .53 61 .74 39 .46 52 .99 16 .22	rus:Russian eng:English spa:Spanish crq:Iyo'wujwa C crt:Iyojwa'ja C	1057 .49 chu:Church Slav 1168 .46 lir:Liberian En 1952 .34 pid:Piaroa 347 .47 crt:Iyojwa'ja C 698 .48 crq:Iyo'wujwa C	254 .22 156 .08 347 .99
no positives				tet:Tetum hsn:Xiang Chine abk:Abkhazian vep:Veps niv:Gilyak	0 0 0	.00 .00 .00 .00 .00		sck:Sadri chg:Chagatai liv:Liv gbm:Garhwali tmw:Temuan	0 .00 0 .00 0 .00 0 .00 0 .00	
hi resource	arb:St Arabic dzo:Dzongkha hin:Hindi rus:Russian spa:Spanish	3787 .99 ars:Najdi Arabi 10300 .09 bod:Tibetan 977 .99 awa:Awadhi 1 .99 bul:Bulgarian 10 .99 ast:Asturian	829 .22 10300 .99 693 .71 1 .99 7 .70	cmn:Mandarin Ch fin:Finnish hin:Hindi rus:Russian spa:Spanish	224 76 256	.99 chr:Cherokee .99 krl:Karelian .99 mai:Maithili .99 eng:English .99 agr:Aguaruna	81 .14 138 .62 24 .32 100 .39 20 .32	cmn:Mandarin Ch eng:English hin:Hindi rus:Russian spa:Spanish	1 367 .99 wuu:Wu Chinese 1267 .99 lir:Liberian En 488 .99 bho:Bhojpuri 1156 .99 chu:Church Slav 1952 .99 pid:Piaroa	254 .20 98 .20

Table 3: Analysis of the GlotLID-M runs with settings  $\theta$ =.0, SET? from Table 1 and Table 2. "most errors": languages with the most false positives. "most noisy": a sample of languages with cleanness between 0 and .5. "no positives": a sample of languages without positives. "hi resource": a more realistic setting in which the distribution is skewed in favor of high-resource languages. For each "language", we give the number of false positives ("FP"), the cleanness of the resulting corpus ("cl": ratio true positives to all positives), its most conflated language ("top FP source"), FP contributed by that language and the ratio of the two FP numbers ("%"). To save space, we write .99 for 1.00.

of the other; e.g., many speakers of Arabic varieties know Standard Arabic. The two Quechua varieties are spoken in neighboring areas of Peru. The quantitatively largest use of Church Slavic (which may be reflected in the size of our corpora) is in Russia by Russian speakers.

Arabic, Chinese and English (and perhaps also Hindi, Persian and Bihari) are diglossic linguistic communities. There may be a lack of clear separation between the two conflated varieties in the available corpora because speakers switch back and forth between more formal and less formal ways of speaking depending on factors like context, audience and subject. This type of fluid switching between languages often occurs in a single sentence or conversation, i.e., it manifests as code switching. As a result, much of the text (and speech) produced in one language may be mixed with the other language. New methods will have to be developed to deal with these quite complex challenges of creating training corpora for language identification; see also (Aguilar et al., 2020).

Apart from these related languages, at least four conflated language pairs in Table 3 are clear errors: Mandarin/Cherokee, Russian/Gilyak, Spanish/Piaroa and Liberian English/Dinka. Similar to the situation we described for the closely related languages, Gilyak (resp. Piaroa) is spoken in an area where Russian (resp. Spanish) is the dominant official language. This means that our training corpora will need to be improved: they most likely

contain many sentences labeled as Gilyak/Piaroa that are partially or completely Russian/Spanish. We leave it to future work to revisit and improve our corpus selection and preprocessing methodology to address this data quality problem.

GlotLID-M confuses Mandarin and Cherokee because our Cherokee training data do not cover the Cherokee syllabary script. Sentences written in this script are returned with a close to uniform distribution over several other scripts, including Chinese, Japanese and Thai, which explains the confusion. The Dinka test set is noisy. In a manual inspection, we found 377 sentences that are clearly English, not Dinka. Because GlotLID-M did not learn very well to discriminate English and Liberian English, 174 of these 377 sentence were classified as Liberian English.

Most noisy corpora. The second part of Table 3 ("most noisy") gives, for each benchmark, a random selection of five languages whose cleanness score cl (ratio of true positive to all positives) is in the range 0<cl<.5. The total number of languages in this range is 9 for FLORES, 27 for UDHR and 6 for GlotLID-C. Again, most of the conflated pairs are closely related languages as in the last section. Additional pairs that occur here are Dyula/Bambara, Evenki/Orok, Croation/Bosnian, Berber languages (Standard Moroccan Tamazight, Atlas Tamazight) and two varieties of Chorote (Iyo'wujwa, Iyojwa'ja). The resulting corpora are noisy, an issue that we will have to

address in future work.

**No positives.** Part 3 of Table 3 ("no positives") gives five random examples from languages for which there was not a single positive classification. There were no such languages for FLORES.

For UDHR, we identified two reasons. (i) Performance on GlotLID-C is good, but poor on UDHR. Tetum is an example. The most likely cause is a domain shift or some other big train/test difference. (ii) The training set is too small (less than 30 sentences): hsn (Xiang Chinese), abk (Abkhazian), vep (Veps) and niv (Gilyak) are in this class.

For the five GlotLID-C random examples with no positives, the reason is also that the training sets were too small (less than 40 sentences): sck (Sadri), chg (Chagatai), liv (Liv), gbm (Garhwali) and tmw (Temuan). We should have set a higher threshold for minimum size of the training corpus. Note that the number of 1665 languages that we use throughout the paper already reflects this insight. Even though we train on 1832 languages, we claim reasonable performance for only 1665 (Table 1).

Test set skewed in favor of high-resource. FLORES and UDHR test sets are balanced: high-resource and low-resource languages have about the same size. Following this model, we constructed the test set of GlotLID-C in the same way. F1 is independent of this distribution, but FPR and cleanness ("cl") are strongly dependent on it. The Spanish corpus generated by GlotLID-M on GlotLID-C test has a dismal cleanness of only .34. Is this a problem for GlotLID-M?

We believe the answer is no, as the corpora we run LID on will have a distribution skewed in favor of high-resource languages. To simulate this more realistic scenario, the last part of Table 3 ("hi resource") gives five selected languages for each benchmark where we have inflated the subsets for high-resource languages by a factor of 100. For example, instead of a single copy of the English part of FLORES, the test set now contains 100 copies.

We see in Table 3 that this results in clean corpora (cl=.99) for each of the fourteen high-resource languages shown: Standard Arabic, Hindi, Russian, Spanish (FLORES); Mandarin, Finnish, Hindi, Russian, Spanish (UDHR); Mandarin, English, Hindi, Russian, Spanish (GlotLID-C). As an example, looking at Spanish for GlotLID-C (the first and last lines in the table), the number of false positives (1952) and the number of false positives contributed by the low-resource language Piaroa (156) are the same. But since the size of Spanish is

increased 100x, its cleanness improves from .34 for the unrealistic uniform distribution to .99 for the realistic skewed distribution. Thus, as we would expect, LID for high-resource languages is a relatively easy problem and this does not change much if we run a broad-coverage LID like GlotLID-M.

Conversely, LID numbers for low-resource languages can be *negatively* affected. The Dzongkha corpus generated from FLORES in the uniform setting has 103 false positives and a cleanness of .91 (not shown). In the skewed setting, making Tibetan a high-resource language causes 10,300 false positives from Tibetan to leak into Dzongkha, reducing its cleanness to an unacceptable .09.

This discussion suggests that the established evaluation methodology for LID is unsatisfactory. We recommend that future work considers both unifom and skewed test sets to better assess how LID is expected to perform in the real world.

This analysis demonstrates how much harder LID becomes when we represent as large and diverse sets of languages as we do. What we have shown is that there is a real danger of creating corpora that are badly contaminated. To address this, we need to develop methodologies and resources that better handle low-resource languages.

Based on the analysis described in this section we created and open-sourced a much improved version of the UDHR test set for evaluation of LID.<sup>6</sup> All UDHR results in this paper are based on the version of the UDHR test set descibed in §5.1.

#### 8 Conclusion

We create GlotLID-C, an LID resource that covers 1832 languages, several times more than prior work. We introduce GlotLID-M, an open-source LID that covers 1665 languages with good results. The comparison of GlotLID-M against four LID baselines shows superior performance for the low-resource use case. In future research, we would like to improve quality of our training corpora and add more low-resource languages in to GlotLID. We hope GlotLID will be a valuable resource in creating higher-quality corpora for low-resource languages.

<sup>6</sup>https://huggingface.co/datasets/ cis-lmu/udhr-lid

#### Limitations

- (1) We publish list of GlotLID-C data sources as part of this work. There is no other LID benchmark available that covers as many languages as GlotLID-C does. GlotLID-C, FLORES and UDHR all have drawbacks as evaluation datasets for LID. An LID trained on GlotLID-C train and tested on GlotLID-C test will often find the same domain in the test set as in the training set. It is well known that this results in overly optimistic evaluation numbers. FLORES and UDHR consist of data that were not originally produced in each language. Rather, they were translated from high-resource languages. The same is true to a lesser extent for GlotLID-C. Translated language is only an imperfect evaluation benchmark because it can differ greatly from natural language data, i.e., translationese is often not a good model of natural language data.
- (2) Many corpora for the lowest resource languages are derived from religious sources. It should be noted that many Bible translations do not reflect actual language use.
- (3) We do not conduct hyperparameter search and instead use the hyperparameters employed by previous studies. However, conducting such a search can make our findings more robust, considering the difference in the number of languages included in our study compared to the prior work.
- (4) Although we tried our best to select the most suitable LIDs as the baseline. We could not compare against all of the LID models. This includes CLD2 (McCandless, 2010), Equilid (Jurgens et al., 2017), Langdetect (Shuyo, 2010), langid.py (Lui and Baldwin, 2012), whatlang (Brown, 2014b,a), idNet (Dunn, 2020), Franc (Wormer, 2014), AfroLID (Adebara et al., 2022), HeLI-OTS (Jauhiainen et al., 2022), transliterate<sup>7</sup>, whatthelang<sup>8</sup>, whatlang-rs<sup>9</sup>, lingua<sup>10</sup>, Google/Bing Online, LanideNN (Kocmi and Bojar, 2017), Paasaa<sup>11</sup>, Q-LID (Ren et al., 2022), UDLDI (Goswami et al., 2020), PALI (Ahmadi et al., 2023), SS-LID (Caswell et al., 2020; Bapna et al., 2022; Kudugunta et al., 2023) and TextCat (Cavnar et al., 1994).

#### **Ethics Statement**

We here highlight key ethical considerations for GlotLID.

**Data.** The data used in our study comes from openly available (but not necessarily freely redistributable) datasets, including resources previously published by researchers, publishers, and translators. We ensured that the data collection process complied with licensing of each dataset.

**Bias.** We recognize potential biases towards higher resource languages. We conducted a comprehensive analysis of errors and evaluated their impact on our results.

**Inclusivity.** We acknowledge the challenges associated with low-resource languages and have taken steps to include a diverse range of languages in our study.

Ethical Use. We have demonstrated both positive and negative outcomes of applying GlotLID-M as an LID tool. We acknowledge that GlotLID-M has a high error rate for some low-resource languages. This means that there is a potential risk of excluding low-resource languages during the collection and processing of NLP corpora.

**Transparency.** We provide detailed descriptions of our methodology, model architecture, and evaluation process. Additionally, we make our research artifacts, including model, code, and list of data sources openly available to foster collaboration and reproducibility.

## 9 Acknowledgements

We would like to thank anonymous reviewers. This work was funded by the European Research Council (grant #740516).

<sup>&</sup>lt;sup>7</sup>https://github.com/barseghyanartur/ transliterate

<sup>8</sup>https://github.com/indix/whatthelang

<sup>9</sup>https://github.com/greyblake/
whatlang-rs

<sup>10</sup>https://github.com/pemistahl/lingua

<sup>11</sup>https://github.com/minibikini/paasaa

## References

- Julien Abadji, Pedro Javier Ortiz Suárez, Laurent Romary, and Benoît Sagot. 2021. Ungoliant: An optimized pipeline for the generation of a very large-scale multilingual web corpus. Proceedings of the Workshop on Challenges in the Management of Large Corpora (CMLC-9) 2021. Limerick, 12 July 2021 (Online-Event), pages 1 9, Mannheim. Leibniz-Institut für Deutsche Sprache.
- Kathrein Abu Kwaik, Motaz Saad, Stergios Chatzikyriakidis, and Simon Dobnik. 2018. Shami: A corpus of Levantine Arabic dialects. In *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*, Miyazaki, Japan. European Language Resources Association (ELRA).
- Ife Adebara and Muhammad Abdul-Mageed. 2022. Towards afrocentric NLP for African languages: Where we are and where we can go. In *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pages 3814–3841, Dublin, Ireland. Association for Computational Linguistics.
- Ife Adebara, AbdelRahim Elmadany, Muhammad Abdul-Mageed, and Alcides Inciarte. 2022. AfroLID: A neural language identification tool for African languages. In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing*, pages 1958–1981, Abu Dhabi, United Arab Emirates. Association for Computational Linguistics.
- David Ifeoluwa Adelani, Marek Masiak, Israel Abebe Azime, Jesujoba Oluwadara Alabi, Atnafu Lambebo Tonja, Christine Mwase, Odunayo Ogundepo, Bonaventure F. P. Dossou, Akintunde Oladipo, Doreen Nixdorf, Chris Chinenye Emezue, Sana Sabah al azzawi, Blessing K. Sibanda, Davis David, Lolwethu Ndolela, Jonathan Mukiibi, Tunde Oluwaseyi Ajayi, Tatiana Moteu Ngoli, Brian Odhiambo, Abraham Toluwase Owodunni, Nnaemeka C. Obiefuna, Shamsuddeen Hassan Muhammad, Saheed Salahudeen Abdullahi, Mesay Gemeda Yigezu, Tajuddeen Gwadabe, Idris Abdulmumin, Mahlet Taye Bame, Oluwabusayo Olufunke Awoyomi, Iyanuoluwa Shode, Tolulope Anu Adelani, Habiba Abdulganiy Kailani, Abdul-Hakeem Omotayo, Adetola Adeeko, Afolabi Abeeb, Anuoluwapo Aremu, Olanrewaju Samuel, Clemencia Siro, Wangari Kimotho, Onyekachi Raphael Ogbu, Chinedu E. Mbonu, Chiamaka I. Chukwuneke, Samuel Fanijo, Jessica Ojo, Oyinkansola F. Awosan, Tadesse Kebede Guge, Sakayo Toadoum Sari, Pamela Nyatsine, Freedmore Sidume, Oreen Yousuf, Mardiyyah Oduwole, Ussen Kimanuka, Kanda Patrick Tshinu, Thina Diko, Siyanda Nxakama, Abdulmejid Tuni Johar, Sinodos Gebre, Muhidin Mohamed, Shafie Abdi Mohamed, Fuad Mire Hassan, Moges Ahmed Mehamed, Evrard Ngabire, , and Pontus Stenetorp. 2023. Masakhanews: News topic classification for african languages. ArXiv.

- Gustavo Aguilar, Sudipta Kar, and Thamar Solorio. 2020. LinCE: A centralized benchmark for linguistic code-switching evaluation. In *Proceedings of the Twelfth Language Resources and Evaluation Conference*, pages 1803–1813, Marseille, France. European Language Resources Association.
- Sina Ahmadi, Milind Agarwal, and Antonios Anastasopoulos. 2023. PALI: A language identification benchmark for Perso-Arabic scripts. In *Tenth Workshop on NLP for Similar Languages, Varieties and Dialects (VarDial 2023)*, pages 78–90, Dubrovnik, Croatia. Association for Computational Linguistics.
- Israa Alsarsour, Esraa Mohamed, Reem Suwaileh, and Tamer Elsayed. 2018. DART: A large dataset of dialectal Arabic tweets. In *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*, Miyazaki, Japan. European Language Resources Association (ELRA).
- Rosana Ardila, Megan Branson, Kelly Davis, Michael Kohler, Josh Meyer, Michael Henretty, Reuben Morais, Lindsay Saunders, Francis Tyers, and Gregor Weber. 2020. Common voice: A massively-multilingual speech corpus. In *Proceedings of the Twelfth Language Resources and Evaluation Conference*, pages 4218–4222, Marseille, France. European Language Resources Association.
- Naveen Arivazhagan, Ankur Bapna, Orhan Firat, Dmitry Lepikhin, Melvin Johnson, Maxim Krikun, Mia Xu Chen, Yuan Cao, George F. Foster, Colin Cherry, Wolfgang Macherey, Zhifeng Chen, and Yonghui Wu. 2019. Massively multilingual neural machine translation in the wild: Findings and challenges. *CoRR*, abs/1907.05019.
- Ankur Bapna, Isaac Caswell, Julia Kreutzer, Orhan Firat, Daan van Esch, Aditya Siddhant, Mengmeng Niu, Pallavi Baljekar, Xavier Garcia, Wolfgang Macherey, et al. 2022. Building machine translation systems for the next thousand languages. *arXiv preprint arXiv:2205.03983*.
- Loïc Barrault, Magdalena Biesialska, Ondřej Bojar, Marta R. Costa-jussà, Christian Federmann, Yvette Graham, Roman Grundkiewicz, Barry Haddow, Matthias Huck, Eric Joanis, Tom Kocmi, Philipp Koehn, Chi-kiu Lo, Nikola Ljubešić, Christof Monz, Makoto Morishita, Masaaki Nagata, Toshiaki Nakazawa, Santanu Pal, Matt Post, and Marcos Zampieri. 2020. Findings of the 2020 conference on machine translation (WMT20). In *Proceedings of the Fifth Conference on Machine Translation*, pages 1–55, Online. Association for Computational Linguistics.
- Loïc Barrault, Ondřej Bojar, Marta R. Costa-jussà, Christian Federmann, Mark Fishel, Yvette Graham, Barry Haddow, Matthias Huck, Philipp Koehn, Shervin Malmasi, Christof Monz, Mathias Müller, Santanu Pal, Matt Post, and Marcos Zampieri. 2019. Findings of the 2019 conference on machine translation (WMT19). In Proceedings of the Fourth Conference on Machine Translation (Volume 2: Shared

- *Task Papers*, *Day 1*), pages 1–61, Florence, Italy. Association for Computational Linguistics.
- Verena Blaschke, Hinrich Schuetze, and Barbara Plank. 2023. A survey of corpora for Germanic low-resource languages and dialects. In *Proceedings* of the 24th Nordic Conference on Computational Linguistics (NoDaLiDa), pages 392–414, Tórshavn, Faroe Islands. University of Tartu Library.
- Terra Blevins and Luke Zettlemoyer. 2022. Language contamination helps explains the cross-lingual capabilities of English pretrained models. In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing*, pages 3563–3574, Abu Dhabi, United Arab Emirates. Association for Computational Linguistics.
- Ondřej Bojar, Christian Buck, Chris Callison-Burch, Christian Federmann, Barry Haddow, Philipp Koehn, Christof Monz, Matt Post, Radu Soricut, and Lucia Specia. 2013. Findings of the 2013 Workshop on Statistical Machine Translation. In *Proceedings of the Eighth Workshop on Statistical Machine Translation*, pages 1–44, Sofia, Bulgaria. Association for Computational Linguistics.
- Ondřej Bojar, Christian Buck, Christian Federmann, Barry Haddow, Philipp Koehn, Johannes Leveling, Christof Monz, Pavel Pecina, Matt Post, Herve Saint-Amand, Radu Soricut, Lucia Specia, and Aleš Tamchyna. 2014. Findings of the 2014 workshop on statistical machine translation. In *Proceedings of the Ninth Workshop on Statistical Machine Translation*, pages 12–58, Baltimore, Maryland, USA. Association for Computational Linguistics.
- Ondřej Bojar, Rajen Chatterjee, Christian Federmann, Yvette Graham, Barry Haddow, Shujian Huang, Matthias Huck, Philipp Koehn, Qun Liu, Varvara Logacheva, Christof Monz, Matteo Negri, Matt Post, Raphael Rubino, Lucia Specia, and Marco Turchi. 2017. Findings of the 2017 conference on machine translation (WMT17). In *Proceedings of the Second Conference on Machine Translation*, pages 169–214, Copenhagen, Denmark. Association for Computational Linguistics.
- Ondřej Bojar, Rajen Chatterjee, Christian Federmann, Yvette Graham, Barry Haddow, Matthias Huck, Antonio Jimeno Yepes, Philipp Koehn, Varvara Logacheva, Christof Monz, Matteo Negri, Aurélie Névéol, Mariana Neves, Martin Popel, Matt Post, Raphael Rubino, Carolina Scarton, Lucia Specia, Marco Turchi, Karin Verspoor, and Marcos Zampieri. 2016. Findings of the 2016 conference on machine translation. In *Proceedings of the First Conference on Machine Translation: Volume 2, Shared Task Papers*, pages 131–198, Berlin, Germany. Association for Computational Linguistics.
- Ondřej Bojar, Rajen Chatterjee, Christian Federmann, Barry Haddow, Matthias Huck, Chris Hokamp, Philipp Koehn, Varvara Logacheva, Christof Monz, Matteo Negri, Matt Post, Carolina Scarton, Lucia

- Specia, and Marco Turchi. 2015. Findings of the 2015 workshop on statistical machine translation. In *Proceedings of the Tenth Workshop on Statistical Machine Translation*, pages 1–46, Lisbon, Portugal. Association for Computational Linguistics.
- Ondřej Bojar, Christian Federmann, Mark Fishel, Yvette Graham, Barry Haddow, Matthias Huck, Philipp Koehn, and Christof Monz. 2018. Findings of the 2018 conference on machine translation (WMT18). In *Proceedings of the Third Conference on Machine Translation: Shared Task Papers*, pages 272–303, Belgium, Brussels. Association for Computational Linguistics.
- Jan A. Botha, Emily Pitler, Ji Ma, Anton Bakalov, Alex Salcianu, David Weiss, Ryan McDonald, and Slav Petrov. 2017. Natural language processing with small feed-forward networks. In *Proceedings of the 2017* Conference on Empirical Methods in Natural Language Processing, pages 2879–2885, Copenhagen, Denmark. Association for Computational Linguistics.
- Houda Bouamor, Sabit Hassan, and Nizar Habash. 2019. The MADAR shared task on Arabic fine-grained dialect identification. In *Proceedings of the Fourth Arabic Natural Language Processing Workshop*, pages 199–207, Florence, Italy. Association for Computational Linguistics.
- Ralf Brown. 2014a. Language-aware string extractor.
- Ralf Brown. 2014b. Non-linear mapping for improved identification of 1300+ languages. In *Proceedings* of the 2014 Conference on Empirical Methods in Natural Language Processing (EMNLP), pages 627–632, Doha, Qatar. Association for Computational Linguistics.
- Ralf D Brown. 2012. Finding and identifying text in 900+ languages. *Digital Investigation*, 9:S34–S43.
- Laurie Burchell, Alexandra Birch, Nikolay Bogoychev, and Kenneth Heafield. 2023. An open dataset and model for language identification. In *Proceedings* of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers), pages 865–879, Toronto, Canada. Association for Computational Linguistics.
- Isaac Caswell, Theresa Breiner, Daan van Esch, and Ankur Bapna. 2020. Language ID in the wild: Unexpected challenges on the path to a thousand-language web text corpus. In *Proceedings of the 28th International Conference on Computational Linguistics*, pages 6588–6608, Barcelona, Spain (Online). International Committee on Computational Linguistics.
- William B Cavnar, John M Trenkle, et al. 1994. N-grambased text categorization. In *Proceedings of SDAIR-94, 3rd annual symposium on document analysis and information retrieval*, volume 161175, page 14. Las Vegas, NV.

- Alexis Conneau, Kartikay Khandelwal, Naman Goyal, Vishrav Chaudhary, Guillaume Wenzek, Francisco Guzmán, Edouard Grave, Myle Ott, Luke Zettlemoyer, and Veselin Stoyanov. 2020. Unsupervised cross-lingual representation learning at scale. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, pages 8440–8451, Online. Association for Computational Linguistics.
- Morris H DeGroot and Stephen E Fienberg. 1983. The comparison and evaluation of forecasters. *Journal of the Royal Statistical Society: Series D (The Statistician)*, 32(1-2):12–22.
- Jonathan Dunn. 2020. Mapping languages: The corpus of global language use. *Language Resources and Evaluation*, 54:999–1018.
- Mahmoud El-Haj, Paul Rayson, and Mariam Aboelezz. 2018. Arabic dialect identification in the context of bivalency and code-switching. In *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*, Miyazaki, Japan. European Language Resources Association (ELRA).
- Dirk Goldhahn, Thomas Eckart, and Uwe Quasthoff. 2012. Building large monolingual dictionaries at the Leipzig corpora collection: From 100 to 200 languages. In *Proceedings of the Eighth International Conference on Language Resources and Evaluation (LREC'12)*, pages 759–765, Istanbul, Turkey. European Language Resources Association (ELRA).
- Santiago Góngora, Nicolás Giossa, and Luis Chiruzzo. 2022. Can we use word embeddings for enhancing Guarani-Spanish machine translation? In *Proceedings of the Fifth Workshop on the Use of Computational Methods in the Study of Endangered Languages*, pages 127–132, Dublin, Ireland. Association for Computational Linguistics.
- Koustava Goswami, Rajdeep Sarkar, Bharathi Raja Chakravarthi, Theodorus Fransen, and John P. McCrae. 2020. Unsupervised deep language and dialect identification for short texts. In *Proceedings of the 28th International Conference on Computational Linguistics*, pages 1606–1617, Barcelona, Spain (Online). International Committee on Computational Linguistics.
- Thamme Gowda, Zhao Zhang, Chris Mattmann, and Jonathan May. 2021. Many-to-English machine translation tools, data, and pretrained models. In Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing: System Demonstrations, pages 306–316, Online. Association for Computational Linguistics.
- Hendrik J Groenewald and Liza du Plooy. 2010. Processing parallel text corpora for three south african language pairs in the autshumato project. *AfLaT* 2010, page 27.

- René Haas and Leon Derczynski. 2021. Discriminating between similar Nordic languages. In *Proceedings of the Eighth Workshop on NLP for Similar Languages, Varieties and Dialects*, pages 67–75, Kiyv, Ukraine. Association for Computational Linguistics.
- Tahmid Hasan, Abhik Bhattacharjee, Md. Saiful Islam, Kazi Mubasshir, Yuan-Fang Li, Yong-Bin Kang, M. Sohel Rahman, and Rifat Shahriyar. 2021. XL-sum: Large-scale multilingual abstractive summarization for 44 languages. In *Findings of the Association for Computational Linguistics: ACL-IJCNLP 2021*, pages 4693–4703, Online. Association for Computational Linguistics.
- Rudali Huidrom, Yves Lepage, and Khogendra Khomdram. 2021. EM corpus: a comparable corpus for a less-resourced language pair Manipuri-English. In *Proceedings of the 14th Workshop on Building and Using Comparable Corpora (BUCC 2021)*, pages 60–67, Online (Virtual Mode). INCOMA Ltd.
- Ayyoob ImaniGooghari, Peiqin Lin, Amir Hossein Kargaran, Silvia Severini, Masoud Jalili Sabet, Nora Kassner, Chunlan Ma, Helmut Schmid, André FT Martins, François Yvon, and Hinrich Schütze. 2023. Glot500: Scaling multilingual corpora and language models to 500 languages. *arXiv preprint arXiv:2305.12182*.
- Abderrahmane Issam and Khalil Mrini. 2022. Goud.ma: a news article dataset for summarization in moroccan darija. In 3rd Workshop on African Natural Language Processing.
- Heidi Jauhiainen, Tommi Jauhiainen, and Krister Linden. 2019a. Wanca in korp: Text corpora for underresourced uralic languages. In *Proceedings of the Research data and humanities (RDHUM) 2019 conference*. University of Oulu.
- Tommi Jauhiainen, Heidi Jauhiainen, and Krister Lindén. 2022. HeLI-OTS, off-the-shelf language identifier for text. In *Proceedings of the Thirteenth Language Resources and Evaluation Conference*, pages 3912–3922, Marseille, France. European Language Resources Association.
- Tommi Jauhiainen, Marco Lui, Marcos Zampieri, Timothy Baldwin, and Krister Lindén. 2019b. Automatic language identification in texts: A survey. *Journal of Artificial Intelligence Research*, 65:675–782.
- Armand Joulin, Edouard Grave, Piotr Bojanowski, and Tomas Mikolov. 2017. Bag of tricks for efficient text classification. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics: Volume 2, Short Papers*, pages 427–431, Valencia, Spain. Association for Computational Linguistics.
- David Jurgens, Yulia Tsvetkov, and Dan Jurafsky. 2017. Incorporating dialectal variability for socially equitable language identification. In *Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers)*, pages

- 51–57, Vancouver, Canada. Association for Computational Linguistics.
- Amir Hossein Kargaran, François Yvon, and Hinrich Schütze. 2023. Glotscript: A resource and tool for low resource writing system identification. *arXiv* preprint arXiv:2309.13320.
- Omid Kashefi. 2018. Mizan: A large persian-english parallel corpus. *arXiv preprint arXiv:1801.02107*.
- Tom Kocmi and Ondřej Bojar. 2017. LanideNN: Multilingual language identification on character window. In Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics: Volume 1, Long Papers, pages 927–936, Valencia, Spain. Association for Computational Linguistics.
- Julia Kreutzer, Isaac Caswell, Lisa Wang, Ahsan Wahab, Daan van Esch, Nasanbayar Ulzii-Orshikh, Allahsera Tapo, Nishant Subramani, Artem Sokolov, Claytone Sikasote, Monang Setyawan, Supheakmungkol Sarin, Sokhar Samb, Benoît Sagot, Clara Rivera, Annette Rios, Isabel Papadimitriou, Salomey Osei, Pedro Ortiz Suarez, Iroro Orife, Kelechi Ogueji, Andre Niyongabo Rubungo, Toan Q. Nguyen, Mathias Müller, André Müller, Shamsuddeen Hassan Muhammad, Nanda Muhammad, Ayanda Mnyakeni, Jamshidbek Mirzakhalov, Tapiwanashe Matangira, Colin Leong, Nze Lawson, Sneha Kudugunta, Yacine Jernite, Mathias Jenny, Orhan Firat, Bonaventure F. P. Dossou, Sakhile Dlamini, Nisansa de Silva, Sakine Cabuk Ballı, Stella Biderman, Alessia Battisti, Ahmed Baruwa, Ankur Bapna, Pallavi Baljekar, Israel Abebe Azime, Ayodele Awokoya, Duygu Ataman, Orevaoghene Ahia, Oghenefego Ahia, Sweta Agrawal, and Mofetoluwa Adeyemi. 2022. Quality at a glance: An audit of web-crawled multilingual datasets. Transactions of the Association for Computational Linguistics, 10:50-72.
- Sneha Kudugunta, Isaac Caswell, Biao Zhang, Xavier Garcia, Christopher A Choquette-Choo, Katherine Lee, Derrick Xin, Aditya Kusupati, Romi Stella, Ankur Bapna, et al. 2023. Madlad-400: A multilingual and document-level large audited dataset. *arXiv* preprint arXiv:2309.04662.
- Anoop Kunchukuttan, Pratik Mehta, and Pushpak Bhattacharyya. 2018. The IIT Bombay English-Hindi parallel corpus. In *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*, Miyazaki, Japan. European Language Resources Association (ELRA).
- Richard Lastrucci, Jenalea Rajab, Matimba Shingange, Daniel Njini, and Vukosi Marivate. 2023. Preparing the vuk'uzenzele and ZA-gov-multilingual South African multilingual corpora. In *Proceedings of the Fourth workshop on Resources for African Indigenous Languages (RAIL 2023)*, pages 18–25, Dubrovnik, Croatia. Association for Computational Linguistics.

- Marco Lui and Timothy Baldwin. 2012. langid.py: An off-the-shelf language identification tool. In *Proceedings of the ACL 2012 System Demonstrations*, pages 25–30, Jeju Island, Korea. Association for Computational Linguistics.
- Kang Kwong Luke and May LY Wong. 2015. The hong kong cantonese corpus: design and uses. *Journal of Chinese Linguistics Monograph Series*, 1(25):312–333.
- Thomas Mayer and Michael Cysouw. 2014. Creating a massively parallel Bible corpus. In *Proceedings of the Ninth International Conference on Language Resources and Evaluation (LREC'14)*, pages 3158–3163, Reykjavik, Iceland. European Language Resources Association (ELRA).
- Michael McCandless. 2010. Accuracy and performance of google's compact language detector. *Blog post*.
- Salima Medhaffar, Fethi Bougares, Yannick Estève, and Lamia Hadrich-Belguith. 2017. Sentiment analysis of Tunisian dialects: Linguistic ressources and experiments. In *Proceedings of the Third Arabic Natural Language Processing Workshop*, pages 55–61, Valencia, Spain. Association for Computational Linguistics.
- Karima Meftouh, Salima Harrat, Salma Jamoussi, Mourad Abbas, and Kamel Smaili. 2015. Machine translation experiments on PADIC: A parallel Arabic DIalect corpus. In *Proceedings of the 29th Pacific Asia Conference on Language, Information and Computation*, pages 26–34, Shanghai, China.
- Jamshidbek Mirzakhalov, Anoop Babu, Duygu Ataman, Sherzod Kariev, Francis Tyers, Otabek Abduraufov, Mammad Hajili, Sardana Ivanova, Abror Khaytbaev, Antonio Laverghetta Jr., Bekhzodbek Moydinboyev, Esra Onal, Shaxnoza Pulatova, Ahsan Wahab, Orhan Firat, and Sriram Chellappan. 2021. A large-scale study of machine translation in Turkic languages. In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing*, pages 5876–5890, Online and Punta Cana, Dominican Republic. Association for Computational Linguistics.
- Alexandru Niculescu-Mizil and Rich Caruana. 2005. Predicting good probabilities with supervised learning. In *Proceedings of the 22nd international conference on Machine learning*, pages 625–632.
- Joakim Nivre, Marie-Catherine de Marneffe, Filip Ginter, Jan Hajič, Christopher D. Manning, Sampo Pyysalo, Sebastian Schuster, Francis Tyers, and Daniel Zeman. 2020. Universal Dependencies v2: An evergrowing multilingual treebank collection. In *Proceedings of the Twelfth Language Resources and Evaluation Conference*, pages 4034–4043, Marseille, France. European Language Resources Association.
- NLLB Team, Marta R. Costa-jussà, James Cross, Onur Çelebi, Maha Elbayad, Kenneth Heafield, Kevin Heffernan, Elahe Kalbassi, Janice Lam, Daniel Licht, Jean Maillard, Anna Sun, Skyler Wang, Guillaume

- Wenzek, Al Youngblood, Bapi Akula, Loic Barrault, Gabriel Mejia Gonzalez, Prangthip Hansanti, John Hoffman, Semarley Jarrett, Kaushik Ram Sadagopan, Dirk Rowe, Shannon Spruit, Chau Tran, Pierre Andrews, Necip Fazil Ayan, Shruti Bhosale, Sergey Edunov, Angela Fan, Cynthia Gao, Vedanuj Goswami, Francisco Guzmán, Philipp Koehn, Alexandre Mourachko, Christophe Ropers, Safiyyah Saleem, Holger Schwenk, and Jeff Wang. 2022. No language left behind: Scaling human-centered machine translation. *arXiv preprint arXiv:2207.04672*.
- Odunayo Ogundepo, Tajuddeen R. Gwadabe, Clara E. Rivera, Jonathan H. Clark, Sebastian Ruder, David Ifeoluwa Adelani, Bonaventure F. P. Dossou, Abdou Aziz DIOP, Claytone Sikasote, Gilles Hacheme, Happy Buzaaba, Ignatius Ezeani, Rooweither Mabuya, Salomey Osei, Chris Emezue, Albert Njoroge Kahira, Shamsuddeen H. Muhammad, Akintunde Oladipo, Abraham Toluwase Owodunni, Atnafu Lambebo Tonja, Iyanuoluwa Shode, Akari Asai, Tunde Oluwaseyi Ajayi, Clemencia Siro, Steven Arthur, Mofetoluwa Adeyemi, Orevaoghene Ahia, Aremu Anuoluwapo, Oyinkansola Awosan, Chiamaka Chukwuneke, Bernard Opoku, Awokoya Ayodele, Verrah Otiende, Christine Mwase, Boyd Sinkala, Andre Niyongabo Rubungo, Daniel A. Ajisafe, Emeka Felix Onwuegbuzia, Habib Mbow, Emile Niyomutabazi, Eunice Mukonde, Falalu Ibrahim Lawan, Ibrahim Said Ahmad, Jesujoba O. Alabi, Martin Namukombo, Mbonu Chinedu, Mofya Phiri, Neo Putini, Ndumiso Mngoma, Priscilla A. Amuok, Ruqayya Nasir Iro, and Sonia Adhiambo. 2023. Afriqa: Cross-lingual openretrieval question answering for african languages.
- Atul Kr Ojha. 2019. English-bhojpuri smt system: Insights from the karaka model. *arXiv preprint arXiv:1905.02239*.
- Pedro Javier Ortiz Suárez, Benoît Sagot, and Laurent Romary. 2019. Asynchronous pipelines for processing huge corpora on medium to low resource infrastructures. Proceedings of the Workshop on Challenges in the Management of Large Corpora (CMLC-7) 2019. Cardiff, 22nd July 2019, pages 9 16, Mannheim. Leibniz-Institut für Deutsche Sprache.
- Mohammad Taher Pilevar, Heshaam Faili, and Abdol Hamid Pilevar. 2011. Tep: Tehran englishpersian parallel corpus. In *International Conference on Intelligent Text Processing and Computational Linguistics*, pages 68–79. Springer.
- Matt Post, Chris Callison-Burch, and Miles Osborne. 2012. Constructing parallel corpora for six Indian languages via crowdsourcing. In *Proceedings of the Seventh Workshop on Statistical Machine Translation*, pages 401–409, Montréal, Canada. Association for Computational Linguistics.
- Ye Qi, Devendra Sachan, Matthieu Felix, Sarguna Padmanabhan, and Graham Neubig. 2018. When and

- why are pre-trained word embeddings useful for neural machine translation? In *Proceedings of the 2018 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 2 (Short Papers)*, pages 529–535, New Orleans, Louisiana. Association for Computational Linguistics.
- Xingzhang Ren, Baosong Yang, Dayiheng Liu, Haibo Zhang, Xiaoyu Lv, Liang Yao, and Jun Xie. 2022. Effective approaches to neural query language identification. *Computational Linguistics*, 48(4):887–906.
- Roberts Rozis and Raivis Skadinš. 2017. Tilde MODEL multilingual open data for EU languages. In *Proceedings of the 21st Nordic Conference on Computational Linguistics*, pages 263–265, Gothenburg, Sweden. Association for Computational Linguistics.
- Alex Salcianu, Andy Golding, Anton Bakalov, Chris Alberti, Daniel Andor, David Weiss, Emily Pitler, Greg Coppola, Jason Riesa, Kuzman Ganchev, et al. 2018. Compact language detector v3.
- Nakatani Shuyo. 2010. Language detection library for java.
- Kathleen Siminyu, Godson Kalipe, Davor Orlic, Jade Abbott, Vukosi Marivate, Sackey Freshia, Prateek Sibal, Bhanu Neupane, David I Adelani, Amelia Taylor, et al. 2021. Ai4d–african language program. arXiv preprint arXiv:2104.02516.
- Martin Thoma. 2018. The wili benchmark dataset for written language identification. *arXiv preprint arXiv:1801.07779*.
- Jörg Tiedemann. 2012. Parallel data, tools and interfaces in OPUS. In *Proceedings of the Eighth International Conference on Language Resources and Evaluation (LREC'12)*, pages 2214–2218, Istanbul, Turkey. European Language Resources Association (ELRA).
- Daan van Esch, Tamar Lucassen, Sebastian Ruder, Isaac Caswell, and Clara Rivera. 2022. Writing system and speaker metadata for 2,800+ language varieties. In *Proceedings of the Thirteenth Language Resources and Evaluation Conference*, pages 5035–5046, Marseille, France. European Language Resources Association.
- Guillaume Wenzek, Marie-Anne Lachaux, Alexis Conneau, Vishrav Chaudhary, Francisco Guzmán, Armand Joulin, and Edouard Grave. 2020. CCNet: Extracting high quality monolingual datasets from web crawl data. In *Proceedings of the Twelfth Language Resources and Evaluation Conference*, pages 4003–4012, Marseille, France. European Language Resources Association.
- Titus Wormer. 2014. Franc library.
- Linting Xue, Noah Constant, Adam Roberts, Mihir Kale, Rami Al-Rfou, Aditya Siddhant, Aditya Barua, and Colin Raffel. 2021. mT5: A massively multilingual

- pre-trained text-to-text transformer. In *Proceedings* of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, pages 483–498, Online. Association for Computational Linguistics.
- Lisa Yankovskaya, Maali Tars, Andre Tättar, and Mark Fishel. 2023. Machine translation for low-resource Finno-Ugric languages. In *Proceedings of the 24th Nordic Conference on Computational Linguistics (NoDaLiDa)*, pages 762–771, Tórshavn, Faroe Islands. University of Tartu Library.
- Jihad Zahir. 2022. Iadd: An integrated arabic dialect identification dataset. *Data in Brief*, 40:107777.
- Omar F. Zaidan and Chris Callison-Burch. 2011. The Arabic online commentary dataset: an annotated dataset of informal Arabic with high dialectal content. In *Proceedings of the 49th Annual Meeting of the Association for Computational Linguistics: Human Language Technologies*, pages 37–41, Portland, Oregon, USA. Association for Computational Linguistics.
- Biao Zhang, Philip Williams, Ivan Titov, and Rico Sennrich. 2020. Improving massively multilingual neural machine translation and zero-shot translation. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, pages 1628–1639, Online. Association for Computational Linguistics.
- Michał Ziemski, Marcin Junczys-Dowmunt, and Bruno Pouliquen. 2016. The United Nations parallel corpus v1.0. In *Proceedings of the Tenth International Conference on Language Resources and Evaluation (LREC'16)*, pages 3530–3534, Portorož, Slovenia. European Language Resources Association (ELRA).

#### A List of data sources

- Wikipedia articles: Wikipedia dumps, <sup>12</sup> WiLI-2018 (Thoma, 2018), Leipzig corporawikipedia split (Goldhahn et al., 2012)
- News: BBC News (Hasan et al., 2021), Global Voices (Tiedemann, 2012), Leipzig corpora-news split (Goldhahn et al., 2012), SETIMES (Tiedemann, 2012)
- **Translation:** NLLB Seed (NLLB Team et al., 2022)
- **Religious:** PBC (Mayer and Cysouw, 2014), Jehovah's Witnesses, <sup>13</sup> 1000Langs <sup>14</sup>
- Crowdsourcing: Tatoeba<sup>15</sup>
- Multiple domain: MT-560 (Gowda et al., 2021; Tiedemann, 2012; Burchell et al., 2023; Post et al., 2012; Ziemski et al., 2016; Rozis and Skadinš, 2017; Kunchukuttan et al., 2018; Qi et al., 2018; Zhang et al., 2020; Bojar et al., 2013, 2014, 2015, 2016, 2017, 2018; Barrault et al., 2019, 2020), LTI (Brown, 2012), Arabic (Zahir, 2022; Alsarsour et al., 2018; Abu Kwaik et al., 2018; Medhaffar et al., 2017; Meftouh et al., 2015; Zaidan and Callison-Burch, 2011; El-Haj et al., 2018; Bouamor et al., 2019), Persian (Pilevar et al., 2011; Kashefi, 2018), Turkic (Mirzakhalov et al., 2021), Bhojpuri (Ojha, 2019), Cantonese (Luke and Wong, 2015), Guaraní (Góngora et al., 2022), Manipuri (Huidrom et al., 2021)
- Government domain: Autshumato (Groenewald and du Plooy, 2010)

We also introduce additional data sources suited for LID, but they are not included in the training of the version of GlotLID-M discussed in the paper:

- **Crowdsourcing:** CommonVoice v11 (Ardila et al., 2020)
- **Web:** Wanca 2016 (Jauhiainen et al., 2019a)
- News: GlotSparse<sup>16</sup> which is a collection of news websites in low-resource languages, MasakhaNEWS (Adelani et al., 2023), Goud.ma (Issam and Mrini, 2022), AI4D Siminyu et al. (2021), Radio Ramogi, <sup>17</sup>

- smugri (Yankovskaya et al., 2023), finnougric (Yankovskaya et al., 2023)
- **Trasnlation:** GlotStoryBook<sup>18</sup> which is a collection of children storybooks in 174 languages from Global Storybooks<sup>19</sup>, AfriQA Ogundepo et al. (2023), smugriflores (Yankovskaya et al., 2023)
- **Multiple domain:** Universal Dependencies v2.12 (Nivre et al., 2020), Abkhaz National Corpus<sup>20</sup>
- Lyrics: lyricstranslate<sup>21</sup>
- **Government domain:** Vuk'uzenzele (Lastrucci et al., 2023)

Specifically, GlotSparse<sup>16</sup> and GlotStoryBook<sup>18</sup> are two corpora that compiled as a side of this project to include more languages and domains for LID.

## B GlotLID-M hyperparameters

We provide the hyperparameters used to train the GlotLID-M in Table 4.

argument	description	value
-minCount	minimal number of word occurrences	1000
-minCountLabel	minimal number of label occurrences	0
-wordNgrams	max length of word ngram	1
-bucket	number of buckets	1e6
-minn	min length of char ngram	2
-maxn	max length of char ngram	5
-loss	loss function	softmax
-dim	size of word vectors	256
-epoch	number of epochs	2
-lr	learning rate	.8

Table 4: GlotLID-M training hyperparameters

## C Evaluation data issues

## C.1 FLORES-200

There are some mistakes in the FLORES-200 dataset which have been raised by the community.

For example, in a GitHub issue,<sup>22</sup> it is pointed out that yue\_Hant and zho\_Hant should actually be very easy to distinguish from each other, and the Cantonese (Yue Chinese, yue\_Hant) data in FLORES-200 is completely wrong.

<sup>12</sup>https://dumps.wikimedia.org/

<sup>13</sup>https://www.jw.org/

<sup>14</sup>https://github.com/ehsanasgari/ 1000Langs

<sup>15</sup>https://tatoeba.org/en/downloads

<sup>16</sup>https://github.com/cisnlp/GlotSparse

<sup>17</sup>https://github.com/Pogayo/

Luo-News-Dataset

<sup>18</sup>https://github.com/cisnlp/
GlotStoryBook

<sup>19</sup>https://github.com/global-asp/

<sup>20</sup>https://clarino.uib.no/abnc/page

<sup>21</sup>https://lyricstranslate.com/

<sup>22</sup>https://github.com/facebookresearch/ flores/issues/61

In another issue<sup>23</sup>, it is mentioned that the Central Atlas Tamazight (tzm) is actually in Standard Moroccan Tamazight (zgh), as confirmed by a native speaker of Central Atlas Tamazight.

#### C.2 UDHR

There are some mistakes with UDHR. For example, both ckb and kmr files are the same. ckb is known for the Arabic script, although it can also be written in Latin. There are also some files that the writing system is not in popular use (based on Kargaran et al. (2023) metadata):

- ckb\_Latn (Arabic script is in use.)
- azb\_Latn (Arabic script is in use.)
- khk\_Mong (Cyrillic script is in use.)
- vie\_Hani (Latin script is in use.)

# D Performance of GlotLID-M per language

The list of languages used to train GlotLID-M, along with the corresponding amount of available data and detailed results for each language, can be found in Tables 5-29

## E Language metadata matching

The per-language comparison between GlotLID-M and the baselines (CLD3, FT176, OpenLID, and NLLB) for each benchmark in scenario is as follows:

**FLORES-200.** (i) GlotLID-M vs CLD3: Tables 30-31 (ii) GlotLID-M vs FT176: Tables 32-33 (iii) GlotLID-M vs OpenLID: Tables 34-35 (iv) GlotLID-M vs NLLB: Tables 36-37

**UDHR.** (i) GlotLID-M vs CLD3: Tables 38-41 (ii) GlotLID-M vs FT176: Tables 42-45 (iii) GlotLID-M vs OpenLID: Tables 46-47 (iv) GlotLID-M vs NLLB: Tables 48-49

The <u>underlined</u> results in each table show the best result for each model, and the **bold** result indicates the overall best result.

The tables also contain the metadata matching rules we define. Column "isocode639-3" contains the ISO 639-3 code of each language. This corresponds to the class used by GlotLID-M (since all our classes are ISO 639-3 codes). The following columns contain the codes that we mapped the ISO

639-3 codes to. For example, Table 30 indicates that we map ISO 639-3 code fas to pes/prs in FLO-RES. In other words, to evaluate our performance for the language fas in FLORES, we (only conceptually) create a new test set in which all sentences labeled as pes or prs in FLORES, are relabeled as fas.

#### **F** Calibration

As stated in §2, an LID model should provide a calibrated confidence measure in addition to its prediction. Reliability diagrams illustrate model calibration (DeGroot and Fienberg, 1983; Niculescu-Mizil and Caruana, 2005). These diagrams use expected sample accuracy as a function of confidence. If the model is perfectly calibrated, then the diagram plots the identity function.

We provide the reliability diagram for GlotLID-M on GlotLID-C test in Figure 2. For GlotLID-C test, the plot is nearly close to the identity function. However, for some of the low confidence scores, it's not calibrated. This mostly happens because we included so many languages in our models, and some of these languages are very similar to each other or have small training sizes.

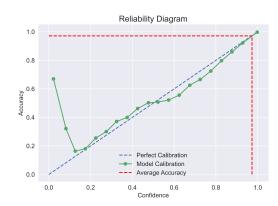


Figure 2: Reliability diagram for GlotLID-M on GlotLID-C test

## **G** Analysis of baseline results

In this section, we analyze baseline results summarized in Table 2. For a detailed breakdown of results for each language in scenario SET?, see §E.

**CLD3**: The largest performance gap between SET? and SET! is for CLD3. This could be attributed to the different architecture of CLD3, which performs better when the set is known. Also, since CLD3 supports fewer languages compared

<sup>23</sup>https://github.com/facebookresearch/ flores/issues/63

to other models, it has an advantage in terms of supporting a higher percentage of high-resource languages within its base set.

CLD3 achieves a lower F1 score than the other FastText-based models in the UDHR benchmark in scenario SET? However, in scenario SET! for the UDHR, it outperforms all other FastText-based models on F1. Additionally, the good performance achieved in both benchmarks (.952 and .922) in scenario SET! illustrates the robustness of this LID.

**FT176.** When comparing FT176 and GlotLID-M in FLORES-200, GlotLID-M achieves the highest F1 scores in FLORES. This may be attributed to the fact that all languages in FT176 are supported by Wikipedia, and GlotLID-M has strong support for these languages. On the other hand, FT176 has the worst overall performance among the FastText models.

NLLB and OpenLID. In FLORES-200, Open-LID and NLLB have an advantage in scenario SET?, as this scenario closely aligns with SET!. Both models provide near-complete support for the languages available in FLORES-200. For the rest of the models and benchmarks, GlotLID-M displays a marked difference in performance and takes the lead. Among the baseline models in scenario SET?, OpenLID shows the best performance in both benchmarks. We will now investigate which languages OpenLID performs better or worse in compared to GlotLID-M.

In scenario SET?, when comparing OpenLID and GlotLID-M on FLORES-200, most of the time the per language scores are very close to each other (see Tables 34-35). However, there are cases where OpenLID performs noticeably better, for example, with a .39 improvement for azb and .29 for awa. On the other hand, GlotLID-M performs better by .2 for zho, which can be attributed to the poorer performance of OpenLID in zho\_Hant. Additionally, both models perform poor on languages such as Yue Chinese, which could be attributed to an issue with FLORES-200 (see §C.1). However, this situation is quite different for UDHR, as GlotLID-M supports more languages than Open-LID, GlotLID-M performs much better in handling languages that are outside the intersection of both models' base sets.

			GlotLID-C		FLORES-200		UDHR		
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR	
aai	Arifama-Miniafia	7954	0.9995	0.0					
aak	Ankave	7784	1.0	0.0					
aau	Abau	7888	1.0	0.0					
aaz	Amarasi	9071	0.999	0.0					
aba	Abé	28725	0.81648	0.00371				0.0041	
abk	Abkhazian	28	0.04600	0.00004					
abn	Abua	61385	0.94699	0.00091					
abq	Abaza	48	1.0	0.0					
abt	Ambulas	15129	0.999	6e-05					
abx	Inabaknon	7855	0.999	3e-05				0.0001	
aby	Aneme Wake	7070	0.998	3e-05				0.0001	
abz	Abui	16642	0.98171	6e-05					
aca	Achagua	4408	0.99929	0.0					
acd	Gikyode	7884	1.0	0.0	0.05502	0.00570	0.00000	0.001	
ace	Achinese	31228	0.98176	0.00014	0.95503	0.00579	0.90909	0.001	
acf	Saint Lucian Creole French	21811	0.97035	0.00019				0.000	
ach	Acoli	42735	0.995	0.00017	0.01560	0.00022		0.0004	
acm	Mesopotamian Arabic	4902	0.79445	0.00091	0.01562	0.00023		0.0000	
acn	Achang	7919	0.9995	0.0	0.00107	6 05		0.0009	
acq	Ta'izzi-Adeni Arabic	1598	0.60947	0.00058	0.00197	6e-05		0.000	
acr	Achi	27176	0.996	0.00011			0.504	0.0004	
acu	Achuar-Shiwiar	11509	0.999	0.0			0.584	0.0001	
ada	Adangme	217601	0.998	8e-05			0.91045	0.0013	
ade	Adele	7924	0.9985	6e-05				0.000	
adh	Adhola	8975	0.99549	6e-05				0.000	
adi	Adi	30717	0.9945	0.00017				0.0002	
adj	Adioukrou	7883	0.998	0.0					
adl	Galo	7956	0.998	3e-05			0.02405		
ıdy	Adyghe	4885	0.99596	0.0			0.83495	(	
ıdz	Adzera	1489	0.99541	0.0	0.20501	0.00100			
ieb	Tunisian Arabic	26935	0.86433	0.00231	0.28501	0.00199		0.000	
er	Eastern Arrernte	9577	0.9995	0.0				0.000	
eu	Akeu	7853	1.0	0.0				0.005	
iey	Amele	9061	0.9995	0.0					
afb	Gulf Arabic	136	0.2	3e-05					
ıfh	Afrihili	79	0.75862	3e-05					
ıfr	Afrikaans	1436086	0.98216	0.00074	1.0	0.0	0.95238	0.000	
agd	Agarabi	7917	1.0	0.0					
agg	Angor	7788	1.0	0.0					
agm	Angaataha	7889	0.9995	0.0					
agn	Agutaynen	7844	0.9985	6e-05					
agr	Aguaruna	23895	0.93626	0.0005			0.81429	0.000	
ıgt	Central Cagayan Agta	7554	0.9985	3e-05					
ıgu	Aguacateco	7928	0.9985	0.0					
ıgw	Kahua	35771	0.998	0.00011					
ıgx	Aghul	1150	0.97898	0.00011					
ıha	Ahanta	18467	0.999	0.0					
ıhk	Akha	134957	1.0	0.0					
iia	Arosi	7804	0.9995	0.0					
iii	Assyrian Neo-Aramaic	10736	1.0	0.0					
iim	Aimol	7949	0.9975	3e-05				0.000	
iin	Ainu (Japan)	324	0.91111	3e-05				0.000	
njg	Aja (Benin)	35237	0.99245	3e-05		0.00028	0.64516	0.007	
iji	Ajië	9916	0.998	3e-05				0.001	
ijp	South Levantine Arabic	28203	0.75111	0.00341	0.10836	0.00102			
ijz	Amri Karbi	7956	0.999	3e-05				0.000	
aka	Akan	1174	0.95114	0.0	0.99852	0.0			
akb	Batak Angkola	7940	0.98993	8e-05					
ake	Akawaio	7933	1.0	0.0					
akh	Angal Heneng	7756	0.9995	3e-05					
ıkl	Aklanon	28							
akp	Siwu	7919	0.9985	3e-05					
ıld	Alladian	7939	1.0	0.0					
dj	Alangan	7877	0.999	6e-05				0.000	
dn	Gheg Albanian	71977	0.98587	0.00014		6e-05			
alp	Alune	7829	0.999	0.0				0.000	
alq	Algonquin	8025	0.9995	0.0				2.000	
als	Tosk Albanian	403221	0.97813	0.00077	0.99852	0.00011	0.85507	0.002	
ılt	Southern Altai	89192	0.99701	0.00017	0.77032	0.00011	0.85507	0.002	
aly	Alyawarr	7411	1.0	0.00017			0.73773	0.000	
uy dz	Alur	103655	0.99651	0.00014					
							1.0	,	
ame amf	Yanesha'	7697	0.9995	0.0			1.0	0.00	
IIIT	Hamer-Banna	7808	0.998	3e-05				0.00	
	Amborio	602075	0.00206	0.00044	0.00051	6- 05	1 0	•	
amh ami	Amharic Amis	682875 104294	0.99206 0.999	0.00044 3e-05	0.99951	6e-05	1.0 0.26087	0	

 $Table\ 5:\ Performance\ of\ GlotLID-M\ on\ GlotLID-C\ test,\ FLORES-200\ and\ UDHR\ benchmarks\ (part\ 1)$ 

			GlotI	LID-C	FLOR	ES-200	UDHR		
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	
amk	Ambai	7850	0.9995	3e-05					
amm	Ama (Papua New Guinea)	7826	1.0	0.0					
amn	Amanab	14975	0.9995	3e-05				0.00011	
amp amr	Alamblak Amarakaeri	7720 7671	0.9985 1.0	3e-05 0.0			1.0	0.0	
amu	Guerrero Amuzgo	8056	0.999	0.0			1.0	0.00022	
amx	Anmatyerre	1949	1.0	0.0					
ang	Old English (ca. 450-1100)	379	0.88889	3e-05					
anm	Anal	30940	0.99499	8e-05					
ann	Obolo	7948	0.9995	0.0					
anv any	Denya Anyin	7928 7949	0.9995 0.999	3e-05 0.0					
aoc	Pemon	98	1.0	0.0				0.00044	
aoi	Anindilyakwa	3813	0.99644	3e-05		0.00028			
aoj	Mufian	15638	0.9995	3e-05					
aom	Ömie	7848	0.9995	3e-05					
aon	Bumbita Arapesh	7832	1.0	0.0				0.00011	
aoz	Uab Meto Sa'a	7962 7764	0.99501 1.0	0.00019 0.0					
apb apc	Levantine Arabic	68045	0.79142	0.00891	0.17857	0.00915			
ape	Bukiyip	7832	0.9995	3e-05	0.17037	0.00713		0.00033	
apn	Apinayé	7353	1.0	0.0					
apr	Arop-Lokep	7853	1.0	0.0					
apt	Apatani	7941	1.0	0.0				0.00011	
apu	Apurinã	7937	1.0	0.0					
apw	Western Apache	7930	0.9995	0.0					
apy	Apalaí Safeyoka	30421 7830	0.9995 1.0	0.0 0.0				0.00022	
apz ara	Arabic	1044573	0.9985	8e-05				0.00022	
arb	Standard Arabic	7100859	0.81268	0.01268	0.25705	0.21515	0.98333	0.00011	
are	Western Arrarnta	7810	1.0	0.0					
arg	Aragonese	30103	0.97236	0.00011					
arh	Arhuaco	3968	0.42298	0.00121					
arl	Arabela	7914	1.0	0.0			0.99187	0.0	
arn	Mapudungun	154241 1151	0.81037	0.01037			0.93913	0.00011	
arp arq	Arapaho Algerian Arabic	3826	0.9971 0.89381	0.0 0.00036		0.00114		0.00011	
ars	Najdi Arabic	23194	0.7232	0.00624	0.00894	0.00114		0.00011	
ary	Moroccan Arabic	31432	0.83395	0.00272	0.56588	0.05164		0.00011	
arz	Egyptian Arabic	183549	0.86439	0.00635	0.46309	0.09806			
asg	Cishingini	7900	0.9975	0.00011					
asm	Assamese	213937	0.99749	0.0	1.0	0.0			
aso	Dano	7694	1.0	0.0	0.0016	0.00051	0.07521	0.00011	
ast ata	Asturian Pele-Ata	1030498 9433	0.97023 0.999	0.00151 3e-05	0.9916	0.00051	0.97521	0.00011	
atb	Zaiwa	7905	1.0	0.0					
atd	Ata Manobo	7849	0.9985	6e-05					
atg	Ivbie North-Okpela-Arhe	7947	0.9995	0.0					
ati	Attié	17922	0.78761	0.00209					
att	Pamplona Atta	7954	1.0	0.0					
auc	Waorani	7930	1.0	0.0		6.05	0.01504	0.0	
aui	Anuki	652 7710	1.0 0.9965	0.0 8e-05		6e-05		0.00044	
auy ava	Awiyaana Avaric	7833	0.9963	0.00011				0.00044	
ava	Kotava	4103	0.95715	0.00011		0.00017		0.00022	
avt	Au	7878	1.0	0.0		0.00017		0.00022	
avu	Avokaya	7590	1.0	0.0					
awa	Awadhi	13074	0.94648	0.00011	0.38951	6e-05			
awb	Awa (Papua New Guinea)	7880	0.9995	3e-05					
awi	Aekyom	7790	0.999	0.0				0.00011	
awx	Awara	1635	0.9958	0.0					
aym ayo	Aymara Ayoreo	368899 7898	0.99402 0.9995	0.00025 3e-05					
ayo	Central Aymara	173203	0.9993	8e-05	0.99557	0.00045	0.98361	0.00022	
azb	South Azerbaijani	532	0.97778	3e-05	0.36583	0.00043	0.70501	5.00022	
aze	Azerbaijani	1069419	0.9995	3e-05					
azg	San Pedro Amuzgos Amuzgo	7939	1.0	0.0					
azj	North Azerbaijani	472589	0.9935	0.00019	0.99901	0.0	0.74306	0.00668	
azz	Highland Puebla Nahuatl	7943	1.0	0.0				0.00011	
bak	Bashkir	171555	0.98846	0.00022	1.0	0.0		0.0012	
bal	Baluchi	20560	0.84211	0.0	0.52562	0.05110	0.40602	0.00625	
bam	Bambara	20569 32978	0.92308 0.99348	0.00061 8e-05	0.52563 0.97521	0.05119 6e-05	0.49682 0.97561	0.00635 0.00011	
han	Ralinese								
ban bao	Balinese Waimaha	32978 7940	0.9995	3e-05	0.77321	06-03	0.97301	0.00011	

Table 6: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 2)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
bas	Basa (Cameroon)	132504	0.996	0.00014		0.00017		0.00022
bav	Vengo	7954	1.0	0.0			0.02105	0.00011
bba bbb	Baatonum Barai	33686 10264	0.999 1.0	6e-05 0.0			0.92187	0.00099
bbc	Batak Toba	279942	0.98618	0.00074				
bbi	Ghomálá'	27499	0.79298	0.00465				0.00109
bbr	Girawa	7675	0.999	3e-05				0.00011
bcc	Southern Balochi	1753	0.99313	3e-05				
bch	Bariai	10603	0.998	3e-05		0.00011	0.07521	0.00022
bci bcl	Baoulé Central Bikol	382411 1193855	0.998 0.99104	8e-05 0.00039		0.00011	0.97521 1.0	0.00033
bco	Kaluli	1544	1.0	0.00039			1.0	0.0
bcw	Bana	7874	1.0	0.0				
bdd	Bunama	7866	0.9985	6e-05				
bdh	Baka (South Sudan)	7948	0.9995	0.0				0.00011
bea	Beaver	677	1.0	0.0				0.0004
bef bel	Benabena Belarusian	7857 428690	0.999 0.998	3e-05 6e-05	1.0	0.0	0.98333	0.00044
bem	Bemba (Zambia)	1477399	0.98039	0.0011	0.9906	0.00045	0.98333	0.00022
ben	Bengali	1659455	0.97466	0.00143	0.99852	6e-05	1.0	0.0
beq	Beembe	7934	0.60249	0.01262				
ber	Berber languages	628585	0.84139	0.00514		0.01335		0.00099
bex	Jur Modo	10586	0.9985	0.0				0.00274
bfd	Bafut	7941	0.999	3e-05				
bfo bfz	Malba Birifor Mahasu Pahari	7898 57	0.998 0.83333	0.00011				
bgr	Bawm Chin	7859	0.83333	6e-05				
bgs	Tagabawa	9968	0.999	0.0				
bgz	Banggai	7819	0.9995	0.0				
bhg	Binandere	2782	0.99632	0.0				
bhl	Bimin	9573	0.999	3e-05				
bho	Bhojpuri	62722	0.64017	0.02426	0.94329	0.00443	0.78519	0.00033
bhp bhw	Bima Biak	7876 109097	0.9995 0.99045	0.0 0.00011				
bib	Bissa	7940	0.99043	0.00011				
big	Biangai	7814	0.9995	3e-05				0.00022
bih	Bihari languages	10000	0.18688	0.00025				
bik	Bikol	30000	0.98838	3e-05				
bim	Bimoba	30166	0.998	0.00011				0.00033
bin	Bini	132682	0.9975	3e-05			0.9927	0.00011
bis biu	Bislama Biete	1062315 7929	0.998 0.99499	0.00011 0.00011			1.0	0.0
biv	Southern Birifor	7936	0.9999	0.00011				0.00022
bjn	Banjar	32196	0.95164	0.00022	0.79496	0.05329		0.00536
bjp	Fanamaket	877	1.0	0.0				
bjr	Binumarien	9867	1.0	0.0				
bjv	Bedjond	7919	0.998	3e-05				
bkd	Binukid	7773	0.998	0.0				
bkq bku	Bakairí Buhid	7773 7911	0.9995 0.999	0.0 3e-05				
bkv	Bekwarra	7860	1.0	0.0				
bla	Siksika	204	0.98361	0.0				
blh	Kuwaa	7902	0.999	0.0				0.00011
blw	Balangao	7883	0.9995	0.0				0.00033
blz	Balantak	7917	0.997	6e-05				
bmb	Bembe	8008	0.56335	0.01023				
bmh bmk	Kein Ghayavi	7688 650	0.9995 0.95385	3e-05 6e-05				
bmk bmq	Bomu	7930	0.93383	0.0				
bmr	Muinane	7926	1.0	0.0				
bmu	Somba-Siawari	9565	0.999	3e-05				0.0001
bnj	Eastern Tawbuid	7881	0.9985	3e-05				
bnp	Bola	14309	0.996	0.00011				
boa	Bora	7650	1.0	0.0	0.04500	. o-	0.99213	0.00011
bod boi	Tibetan	24952	0.98419	0.00077	0.94589	6e-05	0.89091	0.00011
boj bom	Anjam Berom	14853 7960	1.0	0.0 3e-05				0.00022
bom bon	Berom Bine	7960 7901	0.998 1.0	3e-05 0.0				
bos	Bosnian	507207	0.76033	0.00138	0.58206	0.00312	0.18026	0.0100
boy	Tuwuli	7907	0.9985	0.00130	5.50 <b>2</b> 00			2.0100
box	Buamu	7830	1.0	0.0		6e-05		0.00011
bpr	Koronadal Blaan	7840	0.96566	0.00066				
bps	Sarangani Blaan	7840	0.96682	0.00118				
		20000	0.00705	0.0				
bpy bqc	Bishnupriya Boko (Benin)	30000 30639	0.98785 0.99551	0.00017				

Table 7: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 3)

			GlotI	LID-C	FLOR	ES-200	UDHR		
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR.	
bqj	Bandial	7903	0.998	3e-05					
bqp	Busa	7894	0.9955	0.00014				0.00011	
bre	Breton	16810	0.98688	0.00011			0.98361	0.0	
bru	Eastern Bru	7888	0.999	0.0					
brx bsc	Bodo (India) Bassari	11 7949	0.9995	3e-05				0.00022	
bsn	Barasana-Eduria	7547	0.9993	3e-05				0.00022	
bsp	Baga Sitemu	4533	0.99089	0.00017				0.0001	
bsq	Bassa	4073	0.96104	3e-05		0.00028		0.0005	
bss	Akoose	7905	0.999	0.0					
btd	Batak Dairi	9423	0.99246	6e-05				0.0001	
btg	Gagnoa Bété	16784	0.77055	0.00396				0.0005	
bth	Biatah Bidayuh	7889	0.999	0.0					
bts	Batak Simalungun	8277	0.99097	0.00017				0.0001	
btt btx	Bete-Bendi Batak Karo	7866 191461	0.999 0.97756	0.0 0.00069				0.0001	
bua	Buriat	191461	0.97736	6e-05					
bud	Ntcham	7916	0.999	3e-05				0.00022	
bug	Buginese	15386	0.98379	8e-05	0.99802	6e-05	0.95312	0.0005	
buk	Bugawac	7776	0.9995	0.0					
bul	Bulgarian	1762751	0.98762	0.00061	0.99951	0.0	0.96	0.0005	
bum	Bulu (Cameroon)	141188	0.99102	0.0003		6e-05	0.54762	0.0002	
bus	Bokobaru	7882	0.99399	0.00014				0.0001	
bvr	Burarra	7882	1.0	0.0					
bvy	Baybayanon	76	1.0	0.0				0.0001	
bvz	Bauzi	7501	1.0	0.0				0.0001	
bwd	Bwaidoka Baniwa	1522 262	0.99797 0.96104	0.0					
bwi bwq	Southern Bobo Madaré	7921	0.96104	0.0 3e-05				0.0001	
bwq bwu	Buli (Ghana)	7824	0.998	3e-05				0.0001	
bxh	Buhutu	4196	0.99915	3e-05				0.0001	
bxr	Russia Buriat	8599	0.997	8e-05					
byr	Baruya	8233	1.0	0.0					
byv	Medumba	2171	0.97605	8e-05				0.00394	
byx	Qaqet	7783	0.9995	0.0					
bzd	Bribri	8660	0.999	0.0				0.0007	
bzh	Mapos Buang	7937	0.9995	3e-05				0.0001	
bzi	Bisu Balina Vaial English	7830 124087	0.999	0.0					
bzj bzt	Belize Kriol English Brithenig	357	0.94398 0.92308	0.00179 3e-05				0.0001	
caa	Chortí	7940	1.0	0.0				0.0001	
cab	Garifuna	228814	0.98498	0.00039			0.992	0.0001	
cac	Chuj	38234	0.999	3e-05				0.0005	
caf	Southern Carrier	7943	0.99198	0.00017					
cag	Nivaclé	9167	0.9995	0.0				0.00033	
cak	Kaqchikel	164900	0.99601	0.00019			1.0	0.0	
cao	Chácobo	7902	0.999	3e-05				0.0004	
cap	Chipaya	15847	0.999	3e-05				0.0001	
caq	Car Nicobarese	32067	1.0	0.0				0.0005	
car	Galibi Carib Tsimané	9359 7870	0.9995 0.998	3e-05 3e-05				0.0005	
cas cat	Catalan	1137480	0.998	0.00129	1.0	0.0	0.93023	0.0001	
cav	Cavineña	7741	0.9995	0.00129	1.0	0.0	0.73023	0.0001	
cax	Chiquitano	15872	1.0	0.0				0.0001	
cay	Cayuga	31							
cbc	Carapana	7791	0.9975	3e-05					
cbi	Chachi	7863	1.0	0.0			0.9771	0.0002	
cbk	Chavacano	111815	0.98029	0.00025				0.0003	
cbr	Cashibo-Cacataibo	7813	0.9995	0.0			0.7033	0.0	
cbs	Cashinahua	7502	1.0	0.0		6e-05	0.67308	0.0003	
cbt	Chayahuita	7804	0.9995	0.0			0.97479	0.0001	
cbu	Candoshi-Shapra	7588	1.0	0.0			0.33803	0.0	
cbv	Cacua Chopi	7694 120353	1.0 0.99299	0.0 0.00014		6e-05		0.0001	
cce	Comaltepec Chinantec	7890	1.0	0.00014		06-03		0.0001	
ceb	Cebuano	2111383	0.97987	0.00107	0.99503	0.0	0.96721	0.0013	
ceg	Chamacoco	7912	0.9995	0.00107	0.77505	0.0	0.70721	0.000	
cek	Eastern Khumi Chin	7873	1.0	0.0					
ces	Czech	1639384	0.99156	0.00044	0.99951	6e-05	0.98387	0.	
cfm	Falam Chin	38517	0.98848	0.00028			0.85714	0.	
cgc	Kagayanen	7823	0.9995	3e-05					
cgg	Chiga	40958	0.98943	0.00011				0.00022	
cha	Chamorro	16006	0.996	0.00014		6e-05	0.8381	0.0001	
		9202	0.000	ΛΛ		( - OF			
chd che	Highland Oaxaca Chontal Chechen	8393 60837	0.998 0.995	0.0 0.00017		6e-05		0.0001	

Table 8: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 4)

			GlotLID-C		FLOR	ES-200	UDHR	
iso639-3	Language	Sentences	F1↑	$\mathbf{FPR}\!\!\downarrow$	F1↑	$\mathbf{FPR}\!\!\downarrow$	<b>F</b> 1↑	FPR↓
chf	Tabasco Chontal	8213	0.998	6e-05				0.00022
chg	Chagatai	8	0.00					
chj chk	Ojitlán Chinantec Chuukese	6824 377198	0.72469 0.99701	0.00091 0.00017			0.12727 0.97521	0.00471 0.00011
chn	Chinook jargon	57/198	0.99701	0.00017			0.97321	0.00011
cho	Choctaw	124	0.78788	0.0				0.00263
chq	Quiotepec Chinantec	7891	1.0	0.0				0.00044
chr	Cherokee	7982	0.99699	3e-05			0.09677	0.0
chu	Church Slavic	7836	0.4985	0.0			0.06154	0.0
chv chw	Chuvash Chuwabu	39476 119383	0.99301 0.997	0.00025 0.00011		6e-05	0.86154	0.0
chz	Ozumacín Chinantec	7919	1.0	0.00		06-03		
cik	Chokwe	193952	0.9955	0.00011	0.84493	6e-05	0.92641	0.00033
cjo	Ashéninka Pajonal	7774	0.99354	0.00033				
cjp	Cabécar	7921	0.9995	0.0				
cjs	Shor	1553	0.98929	0.0			0.65217	0.0
cjv	Chuave Jinyu Chinese	7852 18	0.9995	0.0				
cjy ckb	Central Kurdish	138398	0.99007	0.00047	0.99901	0.00011		
cko	Anufo	7882	1.0	0.0	0.77701	0.00011		0.00131
ckt	Chukot	1675	0.98619	6e-05				0.00033
cle	Lealao Chinantec	7934	1.0	0.0				
clu	Caluyanun	7850	0.99451	0.00019				
cly	Eastern Highland Chatino	7928	0.77037	0.00217				0.00066
cme	Cerma Emberá-Chamí	7890 16270	0.9995 0.6085	0.0 0.01438				0.00011
cmi cmn	Mandarin Chinese	1073282	0.83808	0.01438		0.05727	0.51064	0.07148
cmo	Central Mnong	16195	0.99699	0.01009		0.03727	0.51004	0.00011
cnh	Hakha Chin	435869	0.99057	0.00047			0.93023	0.00099
cni	Asháninka	11125	0.80793	0.00228			0.90226	0.00142
cnl	Lalana Chinantec	7911	1.0	0.0				
cnt	Tepetotutla Chinantec	7924	1.0	0.0				
cnw	Ngawn Chin	7929	0.99548	3e-05				0.00055
coe cof	Koreguaje Colorado	7741 7555	0.9995 1.0	3e-05 0.0			0.74747	0.00164
cok	Santa Teresa Cora	18162	0.99449	0.00011			0.74747	0.0
con	Cofán	7876	0.9985	3e-05				0.00011
сор	Coptic	23773	1.0	0.0				
cor	Cornish	41272	0.99097	0.00017				
cos	Corsican	11141	0.97444	8e-05		0.00017	0.95082	0.00044
cot	Caquinte	7879	0.9975	3e-05			0.96774	0.00022
cpa cpb	Palantla Chinantec Ucayali-Yurúa Ashéninka	7946 7947	0.9995 0.98448	0.0 0.00039				0.00022
cpb cpc	Ajyíninka Apurucayali	7939	0.998	0.00039				0.00022
cpi	Chinese Pidgin English	7	0.770	0.0				
cpu	Pichis Ashéninka	7945	0.98754	0.00044			0.89908	0.0
сру	South Ucayali Ashéninka	6127	0.9937	6e-05				
crh	Crimean Tatar	28216	0.97352	0.00022	0.98902	6e-05	0.97561	0.00033
cri	Sãotomense	2594	0.94133	8e-05		6e-05	0.84404	0.00033
crk	Plains Cree Moose Cree	293 8076	0.86486 0.9995	0.00011				0.00547
crm crn	El Nayar Cora	23287	0.9993	0.00019				0.00547
crq	Iyo'wujwa Chorote	7731	0.36727	0.00954				0.00055
crs	Seselwa Creole French	506502	0.99104	0.00039			1.0	0.0
crt	Iyojwa'ja Chorote	7826	0.55489	0.0192				0.00066
crx	Carrier	7935	0.99151	0.00028				
csb	Kashubian	10947	0.98221	3e-05				0.00011
csk	Jola-Kasa	7918	0.999	0.0		6e-05		
cso	Sochiapam Chinantec Swampy Cree	7936 476	1.0 0.93671	0.0 3e-05			0.0	0.00186
csw csy	Siyin Chin	30034	0.98449	0.00041			0.0	0.00160
cta	Tataltepec Chatino	7908	0.999	0.0				0.00066
ctd	Tedim Chin	35149	0.88063	0.00564			0.78431	0.0
cto	Emberá-Catío	22638	0.86318	0.00358		6e-05		0.00011
ctp	Western Highland Chatino	7910	0.9995	3e-05				
ctu	Chol	174449	0.9879	0.00011				0.00044
cub	Cubeo	7943	0.9995	3e-05				0.00033
cuc	Usila Chinantec	7901	1.0	0.0				
cui cuk	Cuiba San Blas Kuna	7882 26510	0.9995 0.998	3e-05 3e-05		6e-05		0.00022
cuk	Culina	7821	1.0	0.0		00-03		0.00022
cut	Teutila Cuicatec	7835	0.999	0.0				
cux	Tepeuxila Cuicatec	7954	1.0	0.0				
cwd	Woods Cree	278	0.91304	0.00022				
	Kwere	7950	0.97405	0.00077				

Table 9: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 5)

			GlotI	LID-C	FLOR	ES-200	UDHR		
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	
cwt	Kuwaataay	7828	1.0	0.0					
cya	Nopala Chatino	7946	0.82102	0.00891				0.00033	
cym	Welsh	273301	0.99501	0.00019	0.99951	6e-05	1.0	0.0	
czt	Zotung Chin	9478	0.999	3e-05				0.00011	
daa	Dangaléat	7839	0.999	3e-05				0.00011	
dad	Marik	7726	0.9995	3e-05					
daf	Dan	12719	0.9995	0.0					
dah	Gwahatike	7704	0.999	3e-05					
dak	Dakota	2366	0.99856	0.0					
dan	Danish	3921737	0.96039	0.00173	0.9931	0.00051	0.85135	0.00241	
dar	Dargwa	2195	0.99543	3e-05				0.00055	
ddg	Fataluku	1603	0.98934	6e-05				0.00077	
ddo	Dido	20							
ded	Dedua	10276	0.999	0.0					
des	Desano	7740	1.0	0.0	0.00001	0.0	0.00745	0.00011	
deu	German	1800293	0.96193	0.00212	0.99901	0.0	0.98745	0.00011	
dga	Southern Dagaare	12612	0.998	3e-05			0.71166	0.00482	
dgc	Casiguran Dumagat Agta	7795	0.9995	0.0					
dgi	Northern Dagara	7943	0.9975	3e-05					
dgr	Dogrib	9376	0.9995	0.0				0.00011	
dgz	Daga Dhangu Diangu	7802	0.9975	0.00011				0.00011	
dhg	Dhangu-Djangu Zamba	630	1.0	0.0		0.00022		0.00022	
dhm dhv	Zemba Dehu	7908 403863	0.99649 0.95252	6e-05 0.00223		0.00023		0.00022	
								0.00514	
dig	Digo Southwestern Dinka	7865	0.99449	0.00011	0.00652	6. 05		0.00700	
dik din	Dinka	33790 3290	0.99551 0.38141	0.00019	0.99653	6e-05		0.00799	
dip	Northeastern Dinka	7933	0.38141	0.0 0.00017					
		30006	0.98742	6e-05		0.00011		0.00109	
diq dis	Dimli (individual language) Dimasa	7955	0.997	3e-05		6e-05		0.00109	
diu	Diriku	198	0.88889	0.0		06-03			
div	Dhivehi	30040	1.0	0.0			0.96774	0.0	
dje	Zarma	7899	0.99699	3e-05		6e-05	0.90774	0.00109	
dje djk	Eastern Maroon Creole	98689	0.99548	3e-05		06-03		0.00109	
djr djr	Djambarrpuyngu	7771	0.9985	8e-05		0.0004			
dks	Southeastern Dinka	10409	0.98705	0.00047		0.0004			
dng	Dungan	944	0.98962	0.00047		0.00011		0.00033	
dnj	Dungan Dan	15219	1.0	0.0				0.00033	
dob	Dobu	7854	0.9985	0.0					
dop	Lukpa	7934	1.0	0.0					
dow	Doyayo	7919	0.9995	3e-05				0.00022	
drg	Rungus	244	0.82857	0.0				0.00022	
drt	Drents	40	0.02037	0.0					
dru	Rukai	30027	0.996	0.00011					
dsb	Lower Sorbian	11095	0.97823	0.00011					
dtp	Kadazan Dusun	19197	0.95972	0.00162		6e-05		0.00011	
dts	Toro So Dogon	7822	0.9995	0.00102		00-03		0.00011	
dua	Duala	52748	0.9975	3e-05				0.00011	
due	Umiray Dumaget Agta	7864	0.9985	0.0				0.00011	
dug	Duruma	7836	0.99499	0.00011					
duo	Dupaninan Agta	7795	0.994	0.0					
dur	Dii	7870	0.9985	3e-05				0.00011	
dwr	Dawro	7801	0.99044	8e-05				0.00011	
dws	Dutton World Speedwords	57	0.46154	0.0					
dww	Dawawa	7876	0.9985	3e-05					
dww dyi	Djimini Senoufo	7927	1.0	0.0				0.00033	
dyo	Jola-Fonyi	9559	0.9985	3e-05			0.97391	0.00033	
dyu	Dyula	218015	0.95472	0.00234	0.12435	0.01449	0.23188	0.0069	
dzo	Dzongkha	6899	0.9843	8e-05	0.9496	0.00585	0.90769	0.0012	
ebk	Eastern Bontok	7913	0.9975	3e-05	170	2.30505	2.20.02	3.3012	
efi	Efik	1078995	0.99451	0.00022				0.00755	
egl	Emilian	144	0.38889	3e-05		6e-05			
eka	Ekajuk	7942	0.9985	3e-05		30 03			
ekk	Standard Estonian	300000	0.98759	0.00055			0.90226	0.00142	
eko	Koti	3176	0.99494	0.0			2.20220	5.001 FZ	
ell	Modern Greek (1453-)	4450890	0.98862	0.00061	1.0	0.0	0.97908	0.0	
emi	Mussau-Emira	4352	0.99753	0.0	1.0	0.0	0.7.700	0.0	
eml	Emiliano-Romagnolo	30000	0.98601	0.00041		0.00045		0.00952	
emp	Northern Emberá	8463	0.98001	6e-05		0.00043		0.00732	
emx	Erromintxela	12	0.331	00-03					
enb	Markweeta	7871	0.9995	3e-05					
		10703345	0.63088	0.03212	0.98732	0.00148	0.85294	0.00197	
	English					1/1/1/40			
eng	English Enlbet				0.90732	0.001.0	0.05271	0.001)/	
eng enl enm	English Enlhet Middle English (1100-1500)	7903 39815	1.0 0.9823	0.0 0.00017	0.90732	0.001.0	0.03271	0.00022	

 $Table\ 10:\ Performance\ of\ GlotLID\text{-}M\ on\ GlotLID\text{-}C\ test,\ FLORES\text{-}200\ and\ UDHR\ benchmarks\ (part\ 6)$ 

			GlotI	LID-C	FLOR	ES-200	UDHR		
iso639-3	Language	Sentences	<b>F1</b> ↑	$\mathbf{FPR}\!\!\downarrow$	F1↑	$\mathbf{FPR}\downarrow$	<b>F1</b> ↑	FPR↓	
еро	Esperanto	1161088	0.98377	0.00091	0.99852	0.00017	0.96825	0.00044	
eri	Ogea	7908	0.9995	3e-05					
ese	Ese Ejja	7842	0.9995	0.0			0.75	0.00011	
esi	North Alaskan Inupiatun	7915	0.992	0.00022				0.00011	
esk	Northwest Alaska Inupiatun	7921 3664155	0.99249 0.99399	0.00017 0.00011	1.0	0.0		0.00011	
est esu	Estonian Central Yupik	7942	0.99399	3e-05	1.0	0.0			
eto	Eton (Cameroon)	208	0.95082	3e-05		0.00011			
etr	Edolo	3182	0.99898	0.0		0.00011			
etu	Ejagham	7900	1.0	0.0					
eus	Basque	938424	0.97363	0.0014	0.99951	0.0	0.91045	0.00131	
eve	Even	1149	0.98382	6e-05			0.27869	0.00372	
evn	Evenki	116	0.73684	3e-05			0.20755	0.00394	
ewe	Ewe	1698872	0.99206	0.00044	1.0	0.0	0.98361	0.00022	
ewo	Ewondo	7942	0.9985	0.0				0.00197	
ext	Extremaduran	10066	0.96701	6e-05		0.00017		0.00011	
eza	Ezaa	30880	0.99353	0.0003					
faa fad	Fasu	7854	0.9995	3e-05					
fad fai	Wagi Faiwol	1147 7941	1.0 0.999	0.0 3e-05					
fal	South Fali	7941	0.999	3e-05					
fan	Fang (Equatorial Guinea)	22472	0.99043	6e-05				0.00142	
fao	Faroese	90577	0.99399	0.00011	0.99951	0.0	0.98305	0.00142	
fas	Persian	1000000	0.88456	0.00718	0.,,,,,,	0.0	0.70202	0.0	
fat	Fanti	54615	0.99448	3e-05			0.97521	0.00022	
ffm	Maasina Fulfulde	7872	0.97054	0.00085				0.00044	
fij	Fijian	1232612	0.99106	0.00044	0.99951	0.0	1.0	0.0	
fil	Filipino	38283	0.81967	0.00022					
fin	Finnish	3909988	0.94857	0.00286	0.99901	0.00011	0.36	0.02452	
fkv	Kven Finnish	539	0.67187	3e-05			0.28571	0.0	
fmp	Fe'fe'	104	0.92308	0.0	0.00750	0.0	0.04110	0.00066	
fon	Fon	259192	0.9945	0.00017	0.99752	0.0	0.94118	0.00044	
for	Fore French	7892 2570543	1.0 0.74664	0.0 0.01862	0.99951	6e-05	0.95238	0.00263 0.00066	
fra frm	Middle French (ca. 1400-1600)	32	0.74004	0.01802	0.99931	06-03	0.93238	0.00000	
fro	Old French (842-ca. 1400)	216	0.08333	0.0					
frr	Northern Frisian	12856	0.98633	3e-05		0.00017		0.00022	
fry	Western Frisian	131535	0.99651	0.00017		0.00017	0.99174	0.00011	
fub	Adamawa Fulfulde	34642	0.98303	0.00052		0.00017	0.5517.	0.00175	
fuc	Pulaar	7							
fud	East Futuna	11205	0.99246	6e-05		0.00028		0.00011	
fue	Borgu Fulfulde	4664	0.9815	0.00022		6e-05			
fuf	Pular	12566	0.98898	0.00025			0.04762	0.00044	
fuh	Western Niger Fulfulde	7899	0.97049	0.0008				0.00022	
fuq	Central-Eastern Niger Fulfulde	7908	0.96761	0.00099					
fur	Friulian	54651	0.94985	0.00072	0.99951	6e-05	0.80272	0.00306	
fuv	Nigerian Fulfulde	22406	0.97815	0.0008	0.96843	6e-05	0.76984	0.00241	
gaa	Ga	1217812	0.99501	0.00019			0.93846	0.00088	
gag	Gagauz	17347	0.99548	3e-05			0.94017	0.0	
gah	Alekano Borei	7879	0.999	3e-05				0.00011	
gai	Kandawo	7866 7799	0.9995 0.999	3e-05 3e-05				0.00011	
gam gaw	Nobonob	7838	1.0	0.0				0.00011	
gaz	West Central Oromo	335746	0.99301	0.00022	0.99411	0.00068	0.83221	0.00274	
gba	Gbaya (Central African Republic)	1010	0.99617	0.0	0.77111	0.00000	0.03221	0.00271	
gbi	Galela	7722	0.9985	6e-05					
gbm	Garhwali	36							
gbo	Northern Grebo	7939	1.0	0.0				0.00011	
gbr	Gbagyi	7660	0.998	0.0				0.00011	
gcf	Guadeloupean Creole French	82017	0.98254	0.00055		0.00023		0.00471	
gcr	Guianese Creole French	32425	0.98852	0.00036				0.00022	
gde	Gude	7901	1.0	0.0					
gdg	Ga'dang	7827	0.9995	0.0				0.00022	
gdn	Umanakaina	7737	1.0	0.0				0.00022	
gdr	Wipi	7880	1.0	0.0					
geb	Kire	7822	0.9995	3e-05					
gej	Gen Potrotor	7953	0.9985	6e-05					
gfk	Patpatar Southern Chale	7657 7953	0.9995 0.9995	0.0					
ghe	Southern Ghale Guhu-Samane	7953 7461	0.9995	0.0 3e-05					
ghs gid	Gunu-Samane Gidar	7919	0.998	3e-05 0.0					
gia gil	Gilbertese	428828	0.9993	8e-05					
gii giz	South Giziga	35118	0.998	0.00011					
51L	2		0.9903	6e-05			0.90476	0.00088	
gjn	Gonja	30289							

Table 11: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 7)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
gkp	Guinea Kpelle	45287	0.54231	0.01537			0.92063	0.00109
gla	Scottish Gaelic	95320	0.99298	0.00011	0.99951	6e-05	0.94574	0.00022
gle	Irish	274216	0.9935	0.00017	1.0	0.0	0.95	0.00088
glg	Galician	343533	0.98495	0.00033	0.99703	0.00011	0.98305	0.00011
glk	Gilaki	10879	0.93362	0.00011		0.00818	1.0	0.0
glv	Manx	45473	0.997	0.00011		0.00011	1.0	0.0
gmv	Gamo	15674 7955	0.99701 0.99296	0.00014 3e-05		0.00011		0.00022
gnb gnd	Gangte Zulgo-Gemzek	7873	0.99290	6e-05				0.00022
gng	Ngangam	7833	0.999	0.0				
gnn	Gumati	13043	0.9985	0.0				0.00022
gnw	Western Bolivian Guaraní	17302	0.996	0.00011				
goa	Guro	1971	0.99286	3e-05				0.00142
gof	Gofa	7908	0.98541	0.00022				
gog	Gogo	8642	0.99348	8e-05		0.00062		0.00011
gom	Goan Konkani	89931	0.96933	0.00069		0.00017		0.00044
gor	Gorontalo	7895	0.999	3e-05				
gos	Gronings	5670	0.94176	6e-05				
got	Gothic	3857	0.99652	0.0				
gqr	Gor	7931	0.9975	8e-05				0.00055
grc	Ancient Greek (to 1453)	87146	0.98889	3e-05	1.0	0.0		0.00055
grn	Guarani Garo	62443 8033	0.98069 0.9985	8e-05 0.0	1.0	0.0 6e-05		
grt	Southwest Gbaya	7902	0.9983	0.0		06-03		
gso	Swiss German	108513	0.9993	0.00201		0.00011	0.98333	0.00011
gsw gub	Guajajára	30075	0.93317	0.00201		0.00011	0.96333	0.00011
guc	Wayuu	248890	0.91032	6e-05			0.96063	0.00055
gud	Yocoboué Dida	7933	0.9985	6e-05			0.70003	0.00033
gug	Paraguayan Guaraní	384689	0.87191	0.00762			0.81967	0.0
guh	Guahibo	9114	0.95575	8e-05			0.01707	0.0012
gui	Eastern Bolivian Guaraní	15213	0.99499	8e-05				0.00153
guj	Gujarati	1018488	1.0	0.0	1.0	0.0	1.0	0.0
guk	Gumuz	7906	0.9985	0.0				
gul	Sea Island Creole English	7931	0.9985	6e-05				
gum	Guambiano	8925	0.95248	0.00039				0.00011
gun	Mbyá Guaraní	7929	0.9985	0.0				
guo	Guayabero	7809	1.0	0.0				
guq	Aché	7925	1.0	0.0				
gur	Farefare	71300	0.996	0.00014		6e-05		0.00011
guw	Gun	765163	0.9975	0.00011				0.00011
gux	Gourmanchéma Gusii	7927	0.9975 0.99599	3e-05				0.00022
guz	Guanano	7935 7775	0.99399	6e-05 0.0				
gvc gvf	Golin	7773 7896	0.9985	0.0				
gvl	Gulay	7956	0.9985	3e-05				0.00022
gvn	Kuku-Yalanji	8219	0.9985	6e-05				0.00022
gwi	Gwichin	7845	1.0	0.0				
gxx	Wè Southern	24463	0.63256	0.01293				0.00208
gya	Northwest Gbaya	35345	0.99499	0.00011				
gym	Ngäbere	272246	0.99551	0.00017				0.00022
gyr	Guarayu	15925	0.9985	8e-05			0.62745	0.0
hae	Eastern Oromo	7951	0.99649	6e-05				
hag	Hanga	7659	0.9985	6e-05				0.00044
hak	Hakka Chinese	38023	0.99598	0.0				
hat	Haitian	380465	0.98213	0.00069	0.99852	0.00017	0.90706	0.00274
hau	Hausa	401986	0.98854	0.00041	0.95427	0.00551	0.94488	0.0023
hav	Havu	8780	0.98434	0.00014		6e-05	1.0	0.0
haw	Hawaiian	7859	0.99497	0.0		6e-05	1.0	0.0
hay	Haya	16371	0.92727	8e-05		6e-05		0.00011
hbo hbs	Ancient Hebrew Serbo-Croatian	102471	0.9985 0.99401	8e-05 0.00019				0.00011
hch	Huichol	300000 13394	0.99401	0.00019				
hdn	Northern Haida	13394	0.9963	0.0				
heb	Hebrew	2021869	0.98328	0.00094	0.99606	0.00045	0.99145	0.00011
heg	Helong	9068	0.999	3e-05	0.77000	0.000	0.77173	0.00011
heh	Hehe	8605	0.9955	0.00011		0.00051		0.00022
her	Herero	154169	0.99549	6e-05		6e-05		0.00022
hif	Fiji Hindi	17894	0.98742	0.00017		0.00034		0.00077
hig	Kamwe	7900	0.999	0.0				
hil	Hiligaynon	1762387	0.98665	0.00069		0.00057	1.0	0.0
hin	Hindi	2227417	0.80097	0.01342	0.67444	0.05551	0.62	0.00832
hix	Hixkaryána	7756	1.0	0.0				
hla	Halia	7706	0.999	3e-05				
		7016	1.0	0.0				
hlt	Matu Chin Hmong	7916 163469	1.0	0.0			0.92982	0.0

 $Table\ 12:\ Performance\ of\ GlotLID\text{-}M\ on\ GlotLID\text{-}C\ test,\ FLORES\text{-}200\ and\ UDHR\ benchmarks\ (part\ 8)$ 

			Glotl	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	<b>F1</b> ↑	$\mathbf{FPR} \!\!\downarrow$	F1↑	$\mathbf{FPR} \!\!\downarrow$	F1↑	FPR↓
hmo	Hiri Motu	1029005	0.97791	0.00113				
hmr	Hmar	50021	0.99449	8e-05	0.0000	0.000.		0.00044
hne	Chhattisgarhi	60771	0.95589	0.00017	0.90296	0.00256		0.00011
hnj hnn	Hmong Njua Hanunoo	61134 7931	0.99552 0.9995	0.00022				
hns	Caribbean Hindustani	9791	0.9959	6e-05			0.88889	0.00033
hoc	Ho	1448	0.97035	8e-05			0.00007	0.00033
hop	Норі	7910	1.0	0.0				
hot	Hote	7646	1.0	0.0				
hra	Hrangkhol	30908	0.9935	0.00017				
hrv	Croatian	1901496	0.80685	0.01081	0.75157	0.03272	0.58824	0.00919
hrx	Hunsrik	46411	0.97319	0.00041				
hsb	Upper Sorbian	31517	0.98205	0.00058			1.0	0.0
hsn hto	Xiang Chinese Minica Huitoto	4 7926	0.9995	3e-05				
hub	Huambisa	15262	0.9995	6e-05				0.00033
hui	Huli	7838	0.9995	0.0				0.00033
hun	Hungarian	4361329	0.9726	0.00138	1.0	0.0	0.82192	0.00285
hus	Huastec	42824	0.98231	0.00019			0.97814	0.00044
huu	Murui Huitoto	7704	1.0	0.0			0.98305	0.0
huv	San Mateo Del Mar Huave	10600	0.998	0.0				0.00011
hvn	Sabu	7902	0.9995	0.0				
hwc	Hawai'i Creole English	17681	0.85699	0.00283				0.00011
hye	Armenian	1425068	0.9985	6e-05	1.0	0.0	1.0	0.0
hyw	Western Armenian	679292	0.9995	3e-05				
ian iba	Iatmul Iban	7674 210100	0.999 0.9995	3e-05 0.0				
iba ibg	Ibanag	117204	0.9993	8e-05				0.00033
ibo	Igbo	537005	0.99402	0.00025	0.99951	6e-05	0.98718	0.00033
icr	Islander Creole English	7849	0.99699	0.0	0.55501	00 00	0.50710	0.00022
ido	Ido	40359	0.97836	0.00041		6e-05	0.95	0.00011
idu	Idoma	74684	0.97688	0.0005			0.0	0.00011
ifa	Amganad Ifugao	30672	0.98516	0.00072				
ifb	Batad Ifugao	7913	0.98637	0.00011		6e-05		
ife	Ifè	7870	0.9995	0.0		6e-05		0.00011
ifk	Tuwali Ifugao	7699	0.99397	3e-05		C - 05		0.00022
ifu	Mayoyao Ifugao Keley-I Kallahan	7819 29643	0.999 0.99552	0.0		6e-05		0.00022
ify ige	Igede	76711	0.99332	0.00022				0.00022
ign	Ignaciano	15364	0.9995	3e-05				0.00022
igs	Interglossa	32	0.7773	30 03				
iii	Sichuan Yi	60						
ijc	Izon	3785	0.60347	0.00069				0.00022
ike	Eastern Canadian Inuktitut	30996	0.999	3e-05			0.96842	0.00033
ikk	Ika	7953	0.9995	0.0				
ikw	Ikwere	7934	0.999	0.0				
ilb	Ila	6805	0.99094	6e-05				
ile	Interlingue	17750	0.96945	0.00033	0.00051	6e-05	0.00625	0.00011
ilo	Iloko	2917828	0.9828	0.00096	0.99951	6e-05	0.90625	0.00131
imo ina	Imbongu Interlingua	7720 58339	0.998 0.97512	6e-05 0.00083		6e-05	0.84892	0.00219
inb	Inga	8000	0.9995	0.00		06-03	0.04092	0.00219
ind	Indonesian	2835053	0.8254	0.01117	0.91929	0.00983	0.72	0.00405
ino	Inoke-Yate	7474	0.9995	0.0	0.71727	0.00705	0.72	0.00044
iou	Tuma-Irumu	12564	0.9985	0.0				
ipi	Ipili	6181	0.99944	0.0				
iqw	Ikwo	7943	0.98849	0.0003				
iri	Rigwe	7948	1.0	0.0				
irk	Iraqw	7936	0.9985	0.0				
iry	Iraya	7904	0.999	3e-05				
isd	Isnag	7892	0.999	0.0				0.00011
ish	Esan	111255 150748	0.97726	0.00033	0.00001	0.00011	0.9916	0.00011
isl iso	Icelandic Isoko	656673	0.9955 0.995	0.00011 0.00017	0.99901	0.00011	0.9910	0.00011 0.00022
ita	Italian	2485451	0.993	0.00523	0.99803	0.00017	0.78947	0.00022
its	Isekiri	11791	0.70713	0.00323	5.77503	5.55017	5.10771	0.00000
itv	Itawit	7928	0.9975	3e-05				
ium	Iu Mien	54967	1.0	0.0				0.00099
ivb	Ibatan	7894	0.9975	0.00011				
ivv	Ivatan	7895	0.9975	3e-05				
iws	Sepik Iwam	7956	1.0	0.0				
ixl	Ixil	24719	0.9985	3e-05				
izh ·	Ingrian	21	0.000	0 05		. a.		
izr	Izere	7945	0.998	8e-05		6e-05		0.00011
izz	Izii	7947	0.98445	0.00033		00-03		0.000

 $Table \ 13: \ Performance \ of \ GlotLID-M \ on \ GlotLID-C \ test, \ FLORES-200 \ and \ UDHR \ benchmarks \ (part\ 9)$ 

jac Popti' jae Yabem jam Jamaican Creole English jav Javanese jbo Lojban jbu Jukun Takum jdt Judeo-Tat jic Tol jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kad Georgian kaz Kazakh kbb Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong ket Kei kek Kechí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukala kez Kajingang kha Kananga kha Kananga kha Kanano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong ket Kei kek Kechí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khy Kele (Democratic Republic o khz Keapara kia Kim	Sentences  8027 7624 23393 233182 16508 7940 9 7907 17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181 7909	0.998 1.0 0.99299 0.98066 0.99347 0.99599 0.80832 0.9975 0.13636 0.98375 0.9995 0.99448 0.99298 0.83958 0.99651	0.0 0.00014 0.00077 6e-05 6e-05 0.0 0.00165 8e-05 3e-05 0.00088 0.0 3e-05	F1↑ 0.98346	<b>FPR</b> ↓ 6e-05 0.00187  0.00017	F1↑  0.97581  0.48387	FPR↓ 0.00011 0.00044 0.00099 0.00044 0.01379 0.00066
jae yabem jam Jamaican Creole English jav javanese jbo Lojban jbu Jukun Takum jdt Judeo-Tat jic Tol jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbh Camsá kbh Camsá kbh Kalanga kkc Kalanga kdc Kalanga ka	7624 23393 233182 16508 7940 9 7907 17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181 7909	1.0 0.99299 0.98066 0.99347 0.99599 0.89832 0.9975 0.13636 0.98375 0.99944 0.99298 0.83958	0.0 0.00014 0.00077 6e-05 6e-05 0.0 0.00165 8e-05 3e-05 0.00088 0.0 3e-05		0.00187	0.48387	0.00044 0.00099 0.00044 0.01379
jae Yabem jam Jamaican Creole English jav Javanese jbo Lojban jbu Jukun Takum jdt Judeo-Tat jic Tol jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kannada kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbh Camsá kbh Kahiyè kbd Kahanano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kuha kgp Kaingang kha Khasi kha Khala kha Manogolian kha Kele (Democratic Republic o kha Kasu khy Kele (Democratic Republic o kel	7624 23393 233182 16508 7940 9 7907 17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181 7909	1.0 0.99299 0.98066 0.99347 0.99599 0.89832 0.9975 0.13636 0.98375 0.99944 0.99298 0.83958	0.0 0.00014 0.00077 6e-05 6e-05 0.0 0.00165 8e-05 3e-05 0.00088 0.0 3e-05		0.00187	0.48387	0.00099 0.00044 0.01379
jav Javanese jbo Lojban jbu Jukun Takum jdt Judeo-Tat jic Tol jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kuha kgf Kube kgf Kaingang kha Khasi khh Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khy Kele (Democratic Republic of ken Kelapara	233182 16508 7940 9 7907 17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181	0.98066 0.99347 0.99599 0.9995 0.80832 0.9975 0.13636 0.98375 0.99948 0.99298 0.83958	0.00077 6e-05 6e-05 0.00 0.00165 8e-05 3e-05 0.00088 0.0 3e-05		0.00187	0.48387	0.00099 0.00044 0.01379
jbo Lojban jbu Jukun Takum jdt Judeo-Tat jic Tol jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Kamano kdi Kamano kdi Kamano kdi Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukas kgf Kube kgk Kaingang kha Khasi khh Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o kel	16508 7940 9 7907 17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181	0.99347 0.99599 0.9995 0.80832 0.9975 0.13636 0.98375 0.9995 0.99448 0.99298 0.83958	6e-05 6e-05 0.0 0.00165 8e-05 3e-05 0.00088 0.0 3e-05		0.00017	0.48387	0.00099 0.00044 0.01379
jbu Jukun Takum jdt Judeo-Tat jic Tol jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kannada (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbh Camsá kbh Kahiyè kbq Kanano kbr Kafa kck Kalanga kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Kumam kdi Kumam kdi Kumam kdi Kanano kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukale kgf Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer kks Kasua khy Kele (Democratic Republic o kel	7940 9 7907 17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181	0.99599 0.9995 0.80832 0.9975 0.13636 0.98375 0.9995 0.99448 0.99298 0.83958	0.0 0.00165 8e-05 3e-05 0.00088 0.0 3e-05	1.0			0.00044
jit Judeo-Tat jic Tol jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kat Georgian kat Georgian kat Kadadian kbb Kabiyè kbd Kabardian kbh Camsá kbh Kahal kbh Kahal kbh Kahanad kbh Camsá kbh Camsá kbh Kahanad kbh Kahanad kbh Kabardian kbh Camsá kbh Kahiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Kumam kdi Kumam kdi Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o keapara	9 7907 17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181	0.9995 0.80832 0.9975 0.13636 0.98375 0.9995 0.99448 0.99298 0.83958	0.0 0.00165 8e-05 3e-05 0.00088 0.0 3e-05	1.0			0.01379
jic Tol jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kuiwá kgf Kube kgk Kaingang kha Khasi khh Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khy Kele (Democratic Republic of khy Kele (Democratic Republic of ken Kenyang kha Kasua khy Kele (Democratic Republic of ken Kelpapara	7907 17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181	0.80832 0.9975 0.13636 0.98375 0.9995 0.99448 0.99298 0.83958	0.00165 8e-05 3e-05 0.00088 0.0 3e-05	1.0			
jiv Shuar jmc Machame jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Kamano kdi Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaingang kha Khasi khh Halh Mongolian khi Kele (Democratic Republic of khy Kele (Democratic Republic of kel	17084 7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181	0.80832 0.9975 0.13636 0.98375 0.9995 0.99448 0.99298 0.83958	0.00165 8e-05 3e-05 0.00088 0.0 3e-05	1.0			
jmc Machame jmx Western Juxtlahuaca Mixtee jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Kamamo kdi Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kuka kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khi Kele (Democratic Republic o karamo, khi Kasua khy Kele (Democratic Republic o ken Kenyang ket Ket	7957 234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181 7909	0.9975 0.13636 0.98375 0.9995 0.99448 0.99298 0.83958	8e-05 3e-05 0.00088 0.0 3e-05	1.0			
jmx Western Juxtlahuaca Mixtec jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbh Camsá kbh Kafa kalanga kdc Kalanga kdc Kalanga kdc Makonde kdh Tem kdi Kumam kdi Kumam kdi Kamano kei Kei kew West Kewa kex Kukna kez Kukla kec Ket kew West Kewa kgp Kaingang kha Khasi khh Khmer khs Kasua khy Kele (Democratic Republic of keapara	234 17 2236956 7944 7750 53472 704680 213841 248414 359666 733181 7909	0.13636 0.98375 0.9995 0.99448 0.99298 0.83958	3e-05 0.00088 0.0 3e-05	1.0			0.00066
jpa Jewish Palestinian Aramaic jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Kumam kdi Kamamo kdi Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kainan khm Khmer khs Kasua khy Kele (Democratic Republic of khr Kele kek Kelo	17 2236956 7944 7750 53472 704680 213841 248414 359666 733181	0.98375 0.9995 0.99448 0.99298 0.83958	0.00088 0.0 3e-05	1.0	0.0		
jpn Japanese jra Jarai jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekhí ken Kenyang ket Ket kew West Kewa kex Kuha kgf Kube kgf Kaingang kha Khasi khh Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khr Kala kasu khy Kele (Democratic Republic of khr Kasu khy Kele (Democratic Republic of khr Kala kasu khy Kele (Democratic Republic of kela Kasua khy kele (La Kela Kasua khy Kele	7944 7750 53472 704680 213841 248414 359666 733181	0.9995 0.99448 0.99298 0.83958	0.0 3e-05	1.0	0.0		
jvn Caribbean Javanese kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Kumam kdi Kumam kdi Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Kumam kdi Kumam kdi Kumam kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o khy Kele (Democratic Republic o ken Kepyang	7750 53472 704680 213841 248414 359666 733181 7909	0.99448 0.99298 0.83958	3e-05			0.71498	0.01292
kaa Kara-Kalpak kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kechí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kainang kh Kaniang kh Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	53472 704680 213841 248414 359666 733181 7909	0.99298 0.83958					
kab Kabyle kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekhí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kjg Kaingang kha Khasi khk Halh Mongolian khm Khmer ksh Kele (Democratic Republic of kapara kan kapa kan kasua khy Kele (Democratic Republic of kehz Kapara	704680 213841 248414 359666 733181 7909	0.83958	0.00011				
kac Kachin kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukua kez Kukua kez Kukua kez Kukua kez Kukua ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	213841 248414 359666 733181 7909		0.00011			0.96667	0.00022
kal Kalaallisut kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khr Kafa kapanang ket ket Ket kew Kasua ky Kasua khy Kele (Democratic Republic of khz	248414 359666 733181 7909	0.99651	0.00572	0.85967	0.01221		0.00613
kam Kamba (Kenya) kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kuha kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of kapa Masanga kana Mas	359666 733181 7909	0.996	0.00014 0.00011	1.0	0.0	0.98305	0.00011
kan Kannada kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekhí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaingang kha Khasi khk Halh Mongolian khm Khmer ksh Kele (Democratic Republic of kasa kasa kasa khy Kele (Democratic Republic of khz	733181 7909	0.996	0.00011	0.92406	6e-05	0.98303	0.0
kao Xaasongaxango kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khi Kalanga khy Kele (Democratic Republic o khy Kele kel (Democratic Republic o kalanga kangang ka	7909	0.98377	0.00017	1.0	0.0	1.0	0.0
kap Bezhta kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukna kez Kukna kez Kukna kez Kukna kej Ket kew West Kewa kex Kukna kez Kukna kex Kukna kez Kuk		0.9985	6e-05	1.0	0.0	1.0	0.00033
kaq Capanahua kas Kashmiri kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukna kez Kukna kez Kukna kez Kukna key Ket kew West Kewa kex Kukna kez Kukna kez Kukna kez Kukna kez Kukna kez Kukna kex Kukna kez Kukele kff Koya kgf Kaimá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	912	0.99259	0.0				
kat Georgian kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukna kez Kukle kgf Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khy Kele (Democratic Republic o kbd	7924	1.0	0.0				0.00996
kaz Kazakh kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kuman kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukna kez Kukna kez Kukna kez Kukna kez Kukna kex Kukna kex Kukna kex Kukna kex Kukna kex Kalangang kha Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	12946	0.98941	6e-05	0.97674	0.0		
kbc Kadiwéu kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kuha kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khasi khm Kele (Democratic Republic of khr	734914	0.9975	0.00011	1.0	0.0	1.0	0.0
kbd Kabardian kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khr	386828	0.99452	0.00028	0.99951	0.0	0.96721	0.00033
kbh Camsá kbm Iwal kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khy Kele (Democratic Republic o kby	7861	0.9995	3e-05				
kbm Kabiyè kbq Kamano kbr Kafa kck Kafanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukle kgf Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khy Kele (Democratic Republic o	54247	0.99602	0.00022			0.87692	0.00175
kbp Kabiyè kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukna kej Kaj kya Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of krithale kola Kaira kara kanano kara kanano kara kanano kara kanano kara kanano k	7884	1.0 0.9995	0.0				
kbq Kamano kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khcle kck Kakana kasua khy Kele (Democratic Republic of khz	7796 234402	0.9993	3e-05 0.00017	0.99901	6e-05	0.85714	0.00219
kbr Kafa kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khs Kasua khy Kele (Democratic Republic of khs Kede Kalanga Kalanga Kasua khy Kele (Democratic Republic of khs Keapara	10526	0.9945	0.00017	0.99901	06-03	0.65714	0.00219
kck Kalanga kdc Kutu kde Makonde kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khs Kasua khy Kele (Democratic Republic o	7459	0.9995	3e-05			0.99174	0.00011
kdc Kutu kde Makonde kdh Tem kdi Kumam kdi Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukna kez Kukna kez Kukna khy Kaingang ket Kaiwá kgh Kaiwá kgh Kaiwá kgh Kaiwá kgh Kaiwá kgh Khasi khk Halh Mongolian khy Kele (Democratic Republic o kdh	23763	0.93843	0.0			0.55277	0.00033
kdh Tem kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khj Kudi Karaman Karaman kha Kasua khy Kele (Democratic Republic of khz Karaman Karaman kha Kasua khy Kele (Democratic Republic of khz Kapara	7929	0.97477	0.00044				0.00011
kdi Kumam kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	18823	0.99649	6e-05		0.00034	0.59813	0.0
kdj Karamojong kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kuklee kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	1071	0.99408	0.0			0.77551	0.0
kdl Tsikimba kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic of khz Kapara	7938	0.9965	0.00011				0.00022
kea Kabuverdianu kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	7928	0.99699	3e-05				0.00011
kei Kei kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	7901	0.996	8e-05				
kek Kekchí ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	147918	0.9449	0.00226	0.95238	0.0	0.72727	0.00109
ken Kenyang ket Ket kew West Kewa kez Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	297	0.95556	0.0		6e-05	0.07521	0.00657
ket Ket kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	203758 7933	0.99701	0.00014			0.97521	0.00033
kew West Kewa kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	20	0.999	0.0				
kex Kukna kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	9393	0.99198	0.00017				
kez Kukele kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	873	0.97143	0.0				
kff Koya kgf Kube kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	7935	1.0	0.0				
kgk Kaiwá kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	7934	0.999	0.0				
kgp Kaingang kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	10398	1.0	0.0				
kha Khasi khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	7725	0.9985	8e-05				0.00011
khk Halh Mongolian khm Khmer khs Kasua khy Kele (Democratic Republic o	9799	0.9995	0.0				
khm Khmer khs Kasua khy Kele (Democratic Republic of khz Keapara	36201	0.98589	0.00017		0.00011	0.97521	0.00022
khs Kasua khy Kele (Democratic Republic okhz Keapara	176464	0.9965	8e-05	1.0	0.0	0.98462	0.00011
khy Kele (Democratic Republic o khz Keapara	86506	0.999	6e-05	0.99951	0.0	1.0	0.0
khz Keapara	7848 7011	0.9985	8e-05		6-05		0.00033
	of Congo) 7911 7929	0.9975 0.997	3e-05 8e-05		6e-05		0.00011
Kia Kiiii	30712	0.99499	8e-05				
kik Kikuyu	519523	0.98863	0.00063	0.96562	0.00403		0.00022
kin Kinyarwanda	1575481	0.96376	0.0006	0.90302	0.00034	0.76336	0.0022
kir Kirghiz	740492	0.98714	0.00066	1.0	0.0	0.94488	0.00077
kiu Kirmanjki (individual langua							
kix Khiamniungan Naga		1.0	0.0				
kjb Q'anjob'al	7935	0.996	0.00011				
kje Kisar	30505	0.998	3e-05				_
kjh Khakas	30505 7827	0.88244	0.00322			0.83099	0.00252
kjs East Kewa	30505 7827 43856	0.99301	0.00025				0.00011
kkc Odoodee	30505 7827 43856 7917	0.99933	0.0				0.00077
kki Kagulu	30505 7827 43856 7917 5179	0.99102	0.0003				0.00077
kkj Kako	30505 7827 43856 7917 5179 7957	0.999	0.0				0.00044
kkl Kosarek Yale	30505 7827 43856 7917 5179 7957 7920	0.00007	0.0				
klj Khalaj kln Kalenjin	30505 7827 43856 7917 5179 7957	0.99907					

Table 14: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 10)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓		FPR↓	<b>F</b> 1↑	FPR↓
klt	Nukna	752	0.99567	3e-05				
klv	Maskelynes	7892	0.999	3e-05				
kma	Konni	7936	0.999	6e-05				
kmb	Kimbundu	385054	0.98706	0.0005	0.96321	0.00415	0.99194	0.00011
kmg	Kâte	6156	1.0 0.999	0.0 3e-05				
kmh kmk	Kalam Limos Kalinga	15160 7902	0.999	3e-05				
kmm	Kom (India)	30098	0.99253	0.0003				
kmo	Kwoma	7848	0.9995	3e-05				
kmr	Northern Kurdish	262682	0.999	3e-05	0.99901	0.0	0.66667	0.00646
kms	Kamasau	7838	1.0	0.0				0.00011
kmu	Kanite	7543	1.0	0.0				0.00044
knc	Central Kanuri	16253	0.99498	3e-05	0.8634	0.00153	0.9635	0.00044
kne	Kankanaey	7675	0.997	8e-05				
knf	Mankanya	9446	0.9985	0.0				
kng	Koongo	7934	0.99497	0.0			0.0	0.00033
knj	Western Kanjobal	7919	0.99699	3e-05		6 05		0.00022
knk	Kuranko	7863	0.998	3e-05		6e-05		
kno	Kono (Sierra Leone)	7827	0.9995	0.0				0.00121
knv	Tabo Kandayan	15492	0.9995	3e-05				0.00131
knx kny	Kendayan Kanyok	426 4209	0.95238 0.99619	6e-05 3e-05				
kog	Cogui	7874	0.99019	0.0				0.00131
koj koi	Komi-Permyak	10043	0.9993	8e-05			0.95082	0.00131
kom	Komi	10000	0.98939	0.0			0.73002	0.00033
kon	Kongo	885632	0.999	0.0	0.99802	0.0		
koo	Konzo	208525	0.99354	0.00033	0.55002	0.00017	0.79389	0.00011
kor	Korean	1736401	0.99701	0.00017	1.0	0.0	0.94488	0.00077
kos	Kosraean	87905	0.99501	0.00019				
kpf	Komba	7855	0.998	3e-05				0.00022
kpg	Kapingamarangi	30071	0.9955	0.00011				
kpj	Karajá	7642	0.9995	0.0				
kpr	Korafe-Yegha	7634	0.9995	3e-05				
kpv	Komi-Zyrian	9672	0.99699	0.0				0.00011
kpw	Kobon	7722	1.0	0.0				
kpx	Mountain Koiali	7794	0.9995	0.0				
kpz	Kupsabiny	7945	0.9975	8e-05				0.00044
kqc	Doromu-Koki	5185	0.99873	0.0				
kqe	Kalagan	7872	0.99298	0.00011				
kqf Iral	Kakabai Kyenele	654 667	0.99487 0.99	0.0				
kql kqn	Kaonde	506556	0.99	0.0 0.00014		0.00011	1.0	0.0
kqo	Eastern Krahn	7891	1.0	0.00014		0.00011	1.0	0.0
kqo kqp	Kimré	7916	1.0	0.0				0.00022
kqs	Northern Kissi	7926	0.9985	3e-05			0.20896	0.0
kqw	Kandas	3093	0.99782	6e-05			0.20070	0.0
kqy	Koorete	7827	0.9995	0.0				
krc	Karachay-Balkar	19397	0.98844	0.00017				0.00022
kri	Krio	200310	0.96654	0.00138			0.96875	0.0
krj	Kinaray-A	7942	0.98376	3e-05				
krl	Karelian	194	0.57895	3e-05			0.0875	0.0
kru	Kurukh	7898	0.9995	0.0				
ksb	Shambala	7920	0.99549	8e-05				
ksc	Southern Kalinga	7833	0.999	3e-05				
ksd	Kuanua	7947	0.99649	6e-05				
ksf	Bafia	8272	0.99548	0.0		6e-05		0.00066
ksh	Kölsch	10080	0.96923	0.00014		6e-05		0.00022
ksj	Uare	4199	0.9992	0.0				
ksp	Kaba	4842	0.99735	6e-05				0.00022
ksr	Borong Southorn Visi	9572 180188	0.9995	3e-05		6e-05		0.00033
kss	Southern Kisi		0.9985	6e-05		6e-05		0.00241
ksw ktb	S'gaw Karen Kambaata	149668 7788	1.0 0.9965	0.0 8e-05				0.00033
kti ktj	Plapo Krumen	7/88 7841	0.9965	6e-05				
ktm	Kurti	2425	0.98947	0.00014				
kto	Kuot	7810	0.98947	3e-05				
ktu	Kituba (Democratic Republic of Congo)	18217	0.99448	6e-05		6e-05	0.79322	0.00635
kua	Kuanyama	473208	0.93245	0.00358		0.0004	0., 7522	0.00033
kub	Kutep	7926	0.999	3e-05		2.3001		
kud	'Auhelawa	7895	0.997	8e-05				0.00011
kue	Kuman (Papua New Guinea)	7942	0.9995	3e-05				
kuj	Kuria	7933	0.9995	0.0				0.00022
kum	Kumyk	10568	0.99548	3e-05				0.00022
Kuiii								
kup	Kunimaipa	7530 7926	1.0	0.0				

 $Table\ 15:\ Performance\ of\ GlotLID-M\ on\ GlotLID-C\ test,\ FLORES-200\ and\ UDHR\ benchmarks\ (part\ 11)$ 

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	$\mathbf{FPR}\downarrow$	F1↑	FPR.
kvj	Psikye	7908	1.0	0.0				
kvn	Border Kuna	7926	1.0	0.0				
kwd	Kwaio	7876	0.9995	3e-05				
kwf	Kwara'ae	9038	0.9975	3e-05				
kwi	Awa-Cuaiquer	7920	0.999	0.0		6e-05	0.84716	0.0
kwj	Kwanga	7936	1.0	0.0		6 - 05		0.00022
kwn kwy	Kwangali San Salvador Kongo	304624 471082	0.99552 0.99352	0.00022 0.00028		6e-05 0.0004		0.00022
kwy kxc	Konso	7905	0.99332	0.00028		0.0004		0.00022
kxm	Northern Khmer	7912	1.0	0.0				
kxw	Konai	7887	1.0	0.0				
kyc	Kyaka	7891	0.998	8e-05				
kyf	Kouya	7797	0.9995	3e-05				
kyg	Keyagana	9517	0.999	6e-05				
kyq	Kenga	7902	1.0	0.0				0.00022
kyu	Western Kayah	7907	0.9995	0.0				
kyz	Kayabí	7550	1.0	0.0				
kze kzf	Kosena Do'o Koili	7704 6792	0.9965 0.99649	0.00011 6e-05				
kzi kzj	Da'a Kaili Coastal Kadazan	6159	0.95996	0.00047				0.00033
kzj kzn	Kokola	2619	0.82961	3e-05				0.0003
laa	Southern Subanen	10	0.02701	30 03				0.0001
lac	Lacandon	7923	0.999	3e-05				
lad	Ladino	11721	0.96319	0.0			0.90598	0.00044
lai	Lambya	7869	0.99548	3e-05				
laj	Lango (Uganda)	7941	0.99549	6e-05				0.0001
lam	Lamba	38968	0.98941	6e-05		0.00023		
lao	Lao	26289	0.9995	0.0	1.0	0.0	1.0	0.0
las	Lama (Togo)	7903	0.9995 0.97705	0.0			0.075	0.0001
lat lav	Latin Latvian	217775 345532	0.97703	0.00069 0.00019			0.975	0.0001
lbb	Label	667	1.0	0.00019				
lbe	Lak	218	0.98462	0.0				0.0004
lbi	Ladakhi	7163	1.0	0.0		0.00017		0.0001
lbk	Central Bontok	9400	0.996	0.00014				
lch	Luchazi	236	0.64286	0.0		0.00114		0.0001
lcm	Tungag	9544	0.99599	6e-05				
ldi	Laari	61299	0.9935	0.00017		6e-05		
ldn	Láadan	144	0.97872	0.0				
lea	Lega-Shabunda	3823	0.9907	6e-05		0.00011		0.0001
led	Lendu	4500	0.99485	8e-05 3e-05		6. 05		0.00022
lee lef	Lyélé Lelemi	7873 7901	0.999 0.998	0.0		6e-05		
leh	Lenje	60420	0.99249	0.00017		0.00011		0.0001
lem	Nomaande	7917	0.9995	3e-05		0.00011		0.0001
leu	Kara (Papua New Guinea)	7869	0.9995	0.0				
lew	Ledo Kaili	7859	0.997	8e-05				
lex	Luang	9630	0.9995	0.0				
lez	Lezghian	421	0.98305	3e-05				
lfn	Lingua Franca Nova	22272	0.97358	0.00028				0.0001
lgm	Lega-Mwenga	7945	0.99551	0.00017				
lhi	Lahu Shi	7872	1.0	0.0				0.00022
lhm	Lhomi	7812	0.9995	0.0				
lhu lio	Lahu Wast Cantrol Limbo	73972	1.0	0.0			0.04642	0.4
lia lid	West-Central Limba Nyindrou	7904 9513	1.0 1.0	0.0 0.0			0.94643	0.0001
lif	Nyinarou Limbu	15688	1.0	0.0				0.0001
ui lij	Lindu Ligurian	36632	0.97681	0.00041	0.99901	6e-05	0.49785	0.012
lim	Limburgan	141486	0.96436	0.00041	0.99253	0.0	0.17703	0.0001
lin	Lingala	1856585	0.98325	0.00088	0.99901	0.00011	0.99145	0.00022
lip	Sekpele	7899	0.9995	0.0				
lir	Liberian English	24782	0.53173	0.01958				
lit	Lithuanian	2813062	0.97971	0.00085	0.99951	0.0	0.9375	0.0008
liv	Liv	33						
ljp	Lampung Api	7900	0.99448	3e-05				
lkt	Lakota	22	0.00007	0.00001		0.00022		0.0001
llb	Lolo	30215	0.98327	0.00091		0.00023	0.52465	0.0001
lld	Ladin	1049	0.9589	0.0		6-05	0.53465	0.0015
lln Imk	Lele (Chad)	2151	0.90074	6e-05		6e-05		0.0012
lmk lmo	Lamkang Lombard	7953 62982	0.998 0.97	3e-05 0.00083	0.99554	0.00011		0.0001
lmp	Limbum	7927	0.97	3e-05	0.22334	0.00011		0.0091
lob	Lobi	7937	0.999	0.0			0.92857	0.00022
loe	Saluan	137	0.86667	0.0			0.72037	0.00022
		101		0.0				

 $Table\ 16:\ Performance\ of\ GlotLID-M\ on\ GlotLID-C\ test,\ FLORES-200\ and\ UDHR\ benchmarks\ (part\ 12)$ 

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	$\mathbf{FPR} \!\!\downarrow$	F1↑	$\mathbf{FPR} \!\!\downarrow$	F1↑	FPR↓
lol	Mongo	7934	0.997	0.00011				
lom	Loma (Liberia)	8918	0.96124	0.00014				
loq	Lobala	3745	0.99573	3e-05				
ou	Louisiana Creole	22	0.00000	0.00022		0.00011	0.04000	0.0
oz	Lozi	961751	0.99303	0.00033		0.00011	0.84892	0.0
lsi Ism	Lashi Saamia	7897 7940	0.9995 0.9985	0.0 3e-05		6e-05		0.00077
ltg	Latgalian	14697	0.9983	6e-05	0.99653	0.0		0.00077
ltz	Luxembourgish	133586	0.98798	0.00028	0.99951	0.0	0.98305	0.0
lua	Luba-Lulua	1138848	0.99353	0.0003	0.99653	6e-05	0.71186	0.00175
lub	Luba-Katanga	651814	0.99552	0.00025				0.00285
lue	Luvale	598110	0.998	8e-05		0.00074	0.99145	0.0
lug	Ganda	297207	0.98406	0.00055	0.99653	0.0	0.9589	0.00066
lun	Lunda	394555	0.9985	3e-05		0.00023	0.81752	0.00033
luo	Luo (Kenya and Tanzania)	562230	0.99155	0.00041	1.0	0.0	0.00540	0.00088
lus	Lushai	568212	0.99301	0.00025	0.99653	6e-05	0.93548	0.00088
lut lvs	Lushootseed Standard Latvian	59 3176411	1.0 0.96455	0.0 0.00182	0.99655	0.00034	0.94118	0.00164
lwo	Luwo	7810	0.90433	3e-05	0.99033	0.00034	0.94116	0.00104
lww	Lewo	7830	0.999	6e-05				
lzh	Literary Chinese	17606	0.95639	0.00014				
lzz	Laz	75	0.125	3e-05				
maa	San Jerónimo Tecóatl Mazatec	23769	0.9995	0.0				
mad	Madurese	8060	0.9985	6e-05		0.00028	0.92174	0.0
maf	Mafa	7943	0.998	3e-05				
mag	Magahi	6208	0.96204	3e-05	0.95459	0.00136	0.75385	0.00044
mah	Marshallese	532466	0.99651	0.00019			0.96063	0.00055
mai	Maithili	32796	0.95805	0.00017	0.97366	6e-05	0.83099	0.0
maj	Jalapa De Díaz Mazatec	7883	0.999	3e-05				
mak	Makasar	7860	0.9985	0.0	1.0	0.0	1.0	0.0
mal mam	Malayalam Mam	737267 244791	1.0 0.99601	0.0 0.00017	1.0	0.0	1.0 0.93913	0.00022
maq	Chiquihuitlán Mazatec	7930	0.99001	3e-05			0.55515	0.00022
mar	Marathi	1382828	0.9896	0.00055	1.0	0.0	0.99174	0.00011
mas	Masai	31306	0.999	0.0	1.0	0.0	0.77171	0.00055
mau	Huautla Mazatec	197845	0.9985	6e-05				0.00372
mav	Sateré-Mawé	15290	0.85929	0.00171				0.0023
maw	Mampruli	7890	0.999	6e-05				0.00296
max	North Moluccan Malay	427	0.9011	0.0				
maz	Central Mazahua	9655	0.93082	0.00055			0.83582	0.00186
mbb	Western Bukidnon Manobo	7852	0.9985	3e-05		6 05		0.00000
mbc	Macushi Dilakanan Manaka	9275	0.92423	0.00022		6e-05		0.00022
mbd mbf	Dibabawon Manobo	7818 7930	0.9945 0.99449	0.00014 8e-05		6e-05		
mbh	Baba Malay Mangseng	7930 7897	0.99449	3e-05		06-03		
mbi	Ilianen Manobo	7894	0.9985	6e-05				
mbj	Nadëb	7842	1.0	0.0				
mbl	Maxakalí	7908	1.0	0.0				
mbs	Sarangani Manobo	9330	1.0	0.0				
mbt	Matigsalug Manobo	7888	0.9995	3e-05				0.00044
mca	Maca	7939	1.0	0.0				
mcb	Machiguenga	7743	0.999	3e-05				0.00033
mcd	Sharanahua	7472	0.9995	3e-05			0.97521	0.00022
mcf	Matsés	7847	1.0	0.0		0.00110	1.0	0.0
mck	Mbunda Masana	157207 30987	0.99451	0.00022		0.00119 6e-05		0.00788
men meo	Coatlán Mixe	230569	0.99651 0.98645	0.00014 0.00028		06-03		0.00449
mcp	Makaa	13175	0.98043	3e-05		6e-05		0.00043
mcq	Ese	7924	1.0	0.0		00-03		0.0005
mcu	Cameroon Mambila	7894	0.9995	0.0				
mda	Mada (Nigeria)	7931	0.999	0.0				
mdf	Moksha	86	0.5	3e-05				
mdy	Male (Ethiopia)	37003	1.0	0.0				
med	Melpa	7510	1.0	0.0				
mee	Mengen	7874	0.9995	3e-05				
meh	Southwestern Tlaxiaco Mixtec	1543	0.10196	0.00014				0.00022
mej	Meyah	7842	0.999	0.0				
mek	Mekeo	7799	0.999	3e-05			0.0771	0.0000
	Mende (Sierra Leone) Merey	11481	0.99649	3e-05			0.9771	0.00033
		7903	0.998	8e-05		0.00011		
meq		2016	0.05790	// //				
meq mer	Meru	3946 119511	0.95789	0.0		0.00011		
meq mer meu	Meru Motu	119511	0.98073	0.00014		0.00011		0.00011
men meq mer meu mev mfa	Meru					0.00011		0.00011 0.00011

 $Table\ 17:\ Performance\ of\ GlotLID-M\ on\ GlotLID-C\ test,\ FLORES-200\ and\ UDHR\ benchmarks\ (part\ 13)$ 

mfh mfi mfk mfq mfy mfy mfz mgc mgh mgm mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mic mie mif mig mih mik mil	Language  Matal Wandala North Mofu Moba Mayo Mabaan Morokodo Makhuwa-Meetto Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec Mikasuki	Sentences     7949     7930     7937     9584     10521     7874     3827     78022     209     111     164338     70     7941     7578     22422     609     7918     7889     7887     7923     7899     7875	F1↑  1.0  1.0 0.99346 0.9965 0.99548 1.0 0.99911 0.997 0.68421 0.92 0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448 1.0 0.9995	PPR↓  0.0 0.0 3e-05 8e-05 3e-05 0.0 0.0 8e-05 6e-05 0.0 0.00047 0.0 3e-05 3e-05 0.00025 0.0 3e-05 0.0 0.0 3e-05 0.0 0.0	F1↑	0.00045 0.0004 0.00182 0.00028	F1↑ 0.88722	FPR↓ 0.00011 0.00164 0.00011 0.00033 0.00011 0.00022 0.00022 0.00011
mfi mfk mfq mfy mfy mfy mfz mgc mgh mgm mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Wandala North Mofu Moba Mayo Mabaan Morokodo Makhuwa-Meetto Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7930 7937 9584 10521 7874 3827 78022 209 111 164338 70 7941 7578 22422 609 7918 7889 7887	1.0 0.99346 0.99654 0.99548 1.0 0.99911 0.997 0.68421 0.99007 0.6 0.9985 0.9999 0.98593 0.97727 0.99948 1.0	0.0 3e-05 8e-05 3e-05 0.0 0.0 8e-05 6e-05 0.0 0.00047 0.0 3e-05 3e-05 0.00025 0.00 3e-05		0.0004 0.00182	0.88722	0.00164 0.00011 0.00033 0.00011 0.00022 0.00022
mfk mfq mfy mfz mgc mgh mgm mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	North Mofu Moba Mayo Mabaan Morokodo Makhuwa-Meetto Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7937 9584 10521 7874 3827 78022 209 111 164338 70 7941 7578 22422 609 7918 7889 7887	0.99346 0.9965 0.99548 1.0 0.99911 0.997 0.68421 0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448	3e-05 8e-05 3e-05 0.0 0.0 8e-05 6e-05 0.0 0.00047 0.0 3e-05 0.00025 0.0 3e-05		0.0004 0.00182	0.88722	0.00164 0.00011 0.00033 0.00011 0.00022 0.00022
mfq mfy mfz mgc mgh mgm mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Moba Mayo Mabaan Morokodo Makhuwa-Meetto Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	9584 10521 7874 3827 78022 209 111 164338 70 7941 7578 22422 609 7918 7889 7887 7923 7899	0.9965 0.99548 1.0 0.99911 0.997 0.68421 0.92 0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448 1.0	8e-05 3e-05 0.0 0.0 8e-05 6e-05 0.0 0.00047 0.0 3e-05 3e-05 0.00025 0.0 3e-05		0.0004 0.00182	0.88722	0.00011 0.00033 0.00011 0.00022 0.00022
mfy mfz mgz mgc mgh mgm mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Mayo Mabaan Morokodo Makhuwa-Meetto Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	10521 7874 3827 78022 209 111 164338 70 7941 7578 22422 609 7918 7889 7887 7923 7899	0.99548 1.0 0.99911 0.997 0.68421 0.92 0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448 1.0	3e-05 0.0 0.0 8e-05 6e-05 0.0 0.00047 0.0 3e-05 3e-05 0.00025 0.0 3e-05		0.0004 0.00182	0.88722	0.00011 0.00033 0.00011 0.00022 0.00022
mfz mgc mgh mgm mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Mabaan Morokodo Makhuwa-Meetto Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7874 3827 78022 209 111 164338 70 7941 7578 22422 609 7918 7889 7887 7923 7899	1.0 0.99911 0.997 0.68421 0.92 0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448 1.0	0.0 0.0 8e-05 6e-05 0.0 0.00047 0.0 3e-05 3e-05 0.00025 0.0 3e-05		0.00182		0.00033 0.00011 0.00022 0.00022
mgc mgh mgm mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Morokodo Makhuwa-Meetto Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	3827 78022 209 111 164338 70 7941 7578 22422 609 7918 7889 7887 7923 7899	0.99911 0.997 0.68421 0.92 0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448	0.0 8e-05 6e-05 0.0 0.00047 0.0 3e-05 3e-05 0.00025 0.0 3e-05		0.00182		0.00011 0.00022 0.00022
mgh mgm mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Makhuwa-Meetto Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	78022 209 111 164338 70 7941 7578 22422 609 7918 7889 7887 7923 7899	0.997 0.68421 0.92 0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.9448	8e-05 6e-05 0.0 0.00047 0.0 3e-05 3e-05 0.00025 0.0 3e-05		0.00182		0.00011 0.00022 0.00022
mgm mgo mgr mgv mhi mhi mhr mhw mhy mib mic mie mif mig mih mik	Mambae Meta' Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	209 111 164338 70 7941 7578 22422 609 7918 7889 7887 7923 7899	0.68421 0.92 0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448	6e-05 0.0 0.00047 0.0 3e-05 3e-05 0.00025 0.0 3e-05		0.00182		0.00011 0.00022 0.00022
mgo mgr mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Mambwe-Lungu Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	164338 70 7941 7578 22422 609 7918 7889 7887 7923 7899	0.99007 0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448	0.00047 0.0 3e-05 3e-05 0.00025 0.0 0.0 3e-05				0.00022
mgv mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Matengo Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	70 7941 7578 22422 609 7918 7889 7887 7923 7899	0.6 0.9985 0.999 0.98593 0.97727 0.9995 0.99448 1.0	0.0 3e-05 3e-05 0.00025 0.0 0.0 3e-05				0.00022
mhi mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Ma'di Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7941 7578 22422 609 7918 7889 7887 7923 7899	0.9985 0.999 0.98593 0.97727 0.9995 0.99448 1.0	3e-05 3e-05 0.00025 0.0 0.0 3e-05		0.00028		
mhl mhr mhw mhx mhy mib mic mie mif mig mih mik	Mauwake Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7578 22422 609 7918 7889 7887 7923 7899	0.999 0.98593 0.97727 0.9995 0.99448 1.0	3e-05 0.00025 0.0 0.0 0.0 3e-05		0.00028		
mhr mhw mhx mhy mib mic mie mif mig mih mik	Eastern Mari Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	22422 609 7918 7889 7887 7923 7899	0.98593 0.97727 0.9995 0.99448 1.0	0.00025 0.0 0.0 3e-05		0.00028		
mhw mhx mhy mib mic mie mif mig mih mik	Mbukushu Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	609 7918 7889 7887 7923 7899	0.97727 0.9995 0.99448 1.0	0.0 0.0 3e-05		0.00028		
mhx mhy mib mic mie mif mig mih mik	Maru Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7918 7889 7887 7923 7899	0.9995 0.99448 1.0	0.0 3e-05		0.00020		0.00011
mhy mib mic mie mif mig mih mik	Ma'anyan Atatláhuca Mixtec Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7889 7887 7923 7899	0.99448 1.0	3e-05				
mic mie mif mig mih mik	Mi'kmaq Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7923 7899		0.0				
mie mif mig mih mik	Ocotepec Mixtec Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec	7899	0.9995					
mif mig mih mik	Mofu-Gudur San Miguel El Grande Mixtec Chayuco Mixtec			0.0			0.15625	0.0
mig mih mik	San Miguel El Grande Mixtec Chayuco Mixtec	7975	1.0	0.0				
mih mik	Chayuco Mixtec		0.9985	3e-05				0.00011
mik		7940	0.9995	0.0				0.00011
		7897 104	0.998 0.72727	0.00011				
	Peñoles Mixtec	7894	0.72727	3e-05				0.00022
min	Minangkabau	132106	0.99248	0.00014	0.6616	0.00017	0.87591	0.00175
mio	Pinotepa Nacional Mixtec	7914	0.9985	6e-05				
miq	Mískito	86121	0.97908	0.00069			0.832	0.0
mir	Isthmus Mixe	7505	1.0	0.0				
mit	Southern Puebla Mixtec	7779	0.999	3e-05				
miy	Ayutla Mixtec	7915	1.0	0.0				0.00011
miz mia	Coatzospan Mixtec San Juan Colorado Mixtec	7953 7915	1.0 0.9995	0.0 0.0				0.00011
mje mjw	Karbi	7953	0.9995	0.0				
mkd	Macedonian	809994	0.99253	0.00033	1.0	0.0	0.99174	0.0
mkl	Mokole	7866	0.9995	0.0			*****	
mkn	Kupang Malay	9069	0.998	3e-05				
mks	Silacayoapan Mixtec	7949	0.9985	3e-05				
mkz	Makasae	1720	0.98266	0.0		6e-05		0.00033
mlg	Malagasy	30062	1.0	0.0				
mlh	Mape	7925	0.9985	6e-05		0.00017		0.00011
mlp mlt	Bargam Maltese	7729 2281035	1.0 0.97815	0.0	0.97401	0.00017 0.00307	0.77419	0.00011
mlu	To'abaita	1036	0.99375	3e-05	0.57401	6e-05	0.77417	0.00011
mmn	Mamanwa	7829	0.999	3e-05		00 00		0.0001
mmo	Mangga Buang	7937	0.9985	3e-05				
mmx	Madak	10379	0.999	0.0				
mna	Mbula	13167	0.998	3e-05				
mnb	Muna	7924	1.0	0.0				0.00022
mnc	Manchu	2	0.0005	0.0				
mnf mni	Mundani Manipuri	7866 48249	0.9995 0.9899	0.0 0.0	0.99901	6e-05		
mni mnk	Mandinka	7913	0.9899	3e-05	0.99901	06-03		0.00011
mnr	Mono (USA)	3	0.7703	30-03				0.0001
mnw	Mon	9						
mnx	Manikion	7376	0.9995	3e-05				
mny	Manyawa	50297	0.97712	0.00017				
moa	Mwan	7939	0.9995	0.0				
moc	Mocoví	16176	0.9995	3e-05				
mog	Mongondow	7903	1.0	0.0				
moh	Mohawk	953	0.99678	0.0				
mon mop	Mongolian Mopán Maya	102788 8965	0.98521 0.999	0.0008				
mor	Moro	7935	1.0	0.0			0.9916	0.0
mos	Mossi	626622	0.9925	0.00019	0.98138	0.0	0.97015	0.00044
mox	Molima	7830	0.998	6e-05	5100	0.0		
mpg	Marba	7909	0.9985	3e-05				
mph	Maung	598	1.0	0.0				
mpm	Yosondúa Mixtec	7900	0.999	6e-05				0.00011
mpp	Migabac	3959	1.0	0.0				
mps	Dadibi	30278	0.9995	0.0				0.000
mpt	Mian Minima Parasati	7692	0.999	3e-05				0.00241
mpx mqb	Misima-Panaeati Mbuko	8788 7873	0.998 0.9995	3e-05 0.0				0.00022

Table 18: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 14)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
mqj	Mamasa	8069	0.992	0.00022				0.00011
mqy	Manggarai	7953	0.9985	3e-05				
mrg	Mising	6373	0.9995	0.0				0.00022
mri	Maori	79437	0.98948	0.00025	0.99901	6e-05	0.8227	0.00022
mrj	Western Mari	10083	0.99041	0.0		6 05		0.00011
mrq	North Marquesan	1007 187	0.96774 0.8	0.0 0.0		6e-05		0.00011
mrv mrw	Mangareva Maranao	7932	0.9985	3e-05				
msa	Malay (macrolanguage)	53819	0.998	3e-05		6e-05		0.00011
msb	Masbatenyo	7900	0.99549	8e-05		00 03		0.00011
msc	Sankaran Maninka	1783	0.98641	6e-05				0.00077
mse	Musey	7917	0.9975	3e-05				
msk	Mansaka	7775	0.99101	0.00028				
msm	Agusan Manobo	7776	0.995	0.00014				
msy	Aruamu	7694	0.9995	3e-05				
mta	Cotabato Manobo	7857	1.0	0.0				
mtg	Una	7834	0.999	0.0				
mti	Maiwa (Papua New Guinea) Moskona	7899 7846	0.99699 0.9985	3e-05 6e-05				
mtj mto	Totontepec Mixe	7846 7906	1.0	0.0			0.0	0.00088
mtp	Wichí Lhamtés Nocten	7934	1.0	0.0			0.0	0.00011
mua	Mundang	7908	0.9995	0.0				0.00011
mug	Musgu	30824	0.99451	0.00019				
muh	Mündü	7469	1.0	0.0				
mur	Murle	7816	0.999	0.0				0.00011
mus	Creek	598	0.9172	8e-05				
mux	Bo-Ung	7692	0.999	3e-05				
muy	Muyang	7876	0.9995	3e-05				0.00011
mva	Manam	7947	0.999	0.0				
mvn	Minaveha	7827	0.99699	0.0				
mvp	Duri	7814	0.996	0.00011				
mvv	Tagal Murut	28						
mwc	Are	1150	0.99342	3e-05				
mwf	Murrinh-Patha	316	1.0	0.0				0.00022
mwl	Mirandese Sar	33797 30621	0.99247 0.999	8e-05 6e-05				0.00033
mwm mwn	Nyamwanga	54496	0.999	6e-05		0.0004		0.00011
mwp	Kala Lagaw Ya	4301	0.9984	3e-05		0.0004		0.00011
mwq	Mün Chin	7927	1.0	0.0				0.00022
mwy	Mentawai	7901	0.999	3e-05				0.00022
mww	Hmong Daw	8021	0.99346	0.0				
mxb	Tezoatlán Mixtec	7938	1.0	0.0				0.00022
mxp	Tlahuitoltepec Mixe	7924	0.9995	0.0				0.00011
mxq	Juquila Mixe	7933	1.0	0.0				0.00011
mxt	Jamiltepec Mixtec	7916	0.9975	3e-05				
mxv	Metlatónoc Mixtec	141566	0.99151	0.00028			0.14925	0.0
mya	Burmese	498977	0.998	0.00011	1.0	0.0	0.66292	0.00646
myb	Mbay	7908	0.9975	3e-05				0.00011
myk	Mamara Senoufo	7920	0.999	3e-05				
myu	Mundurukú	7683	0.9995	3e-05				
myv	Erzya	18314	0.992	0.00022				
nyw	Muyuw Masaaba	6727 7954	1.0 0.999	0.0 0.0				
myx myy	Macuna	7837	0.999	0.0				
mza	Santa María Zacatepec Mixtec	7940	1.0	0.0				0.00088
mzh	Wichí Lhamtés Güisnay	29905	0.996	0.00014				0.00011
mzk	Nigeria Mambila	7917	0.9995	0.0				0.0001
mzl	Mazatlán Mixe	7907	1.0	0.0				0.00011
nzm	Mumuye	7945	1.0	0.0				
mzn	Mazanderani	30000	0.96612	0.00019		0.00295		
mzw	Deg	7889	0.999	6e-05				0.0007
mzz	Maiadomu	652	1.0	0.0				
nab	Southern Nambikuára	7609	1.0	0.0				
naf	Nabak	7692	0.9995	3e-05				0.00011
nah	Nahuatl languages	212	0.68293	3e-05				0.00011
nak	Nakanai	7892	0.9995	0.0				
nan	Min Nan Chinese	37894	1.0	0.0			0.0	0.0001
nan	Min Nan Chinese	37894	1.0	0.0			0.0	0.00011
nap	Neapolitan	10002	0.97646	0.0				
naq	Khoekhoe	106437	0.9995	0.0				
nas	Naasioi	7985	1.0	0.0				
nau	Nauru	01212	0.000	6-05			0.0017	0.00011
nav	Navajo	91313 7948	0.999 1.0	6e-05 0.0			0.9916	0.00011
naw								
naw nba	Nawuri Nyemba	162410	0.98861	0.00058		0.00227		

Table 19: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 15)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
nbc	Chang Naga	7899	0.998	6e-05				
nbe	Konyak Naga	7951	0.9995	0.0				
nbl	South Ndebele	238555	0.9679	0.0008			0.0	0.00055
nbq nbu	Nggem Rongmei Naga	3714 30767	1.0 0.99198	0.0 0.00017				0.00033
nca	Iyo	7866	0.99198	3e-05				
nch	Central Huasteca Nahuatl	191991	0.97793	0.00116				0.00668
ncj	Northern Puebla Nahuatl	192101	0.99303	0.0003				0.00033
ncl	Michoacán Nahuatl	7934	0.998	6e-05				
nct	Chothe Naga	7936	0.998	3e-05				
ncu ncx	Chumburung Central Puebla Nahuatl	7654 161081	1.0 0.97718	0.0 0.00085				0.00011
ndc	Ndau	197046	0.99601	0.00083		6e-05		0.00011
nde	North Ndebele	234610	0.96552	0.00019		0.00273		0.00624
ndh	Ndali	743	0.96257	3e-05		0.00068		0.00011
ndi	Samba Leko	7924	1.0	0.0				
ndj	Ndamba	7955	0.9965	0.00011		6e-05	0.06765	0.00022
ndo	Ndonga Ndo	481932 7946	0.92503 1.0	0.0005 0.0		0.00136	0.86765	0.00197
ndp nds	Low German	128598	0.98218	0.00077			1.0	0.0
ndz	Ndogo	7937	0.9995	0.0			1.0	0.0
neb	Toura (Côte d'Ivoire)	7864	1.0	0.0				
nep	Nepali (macrolanguage)	137937	0.99649	0.0				
new	Newari	30017	0.97093	0.00025		0.00051		0.00011
nfa	Dhao	7649	1.0	0.0				
nfr	Nafaanra Northern Ngbandi	7930 3998	0.9985 0.99164	0.0 3e-05				0.00011
ngb ngc	Ngombe (Democratic Republic of Congo)	7941	0.99104	0.00017				0.00011
ngl	Lomwe	177993	0.97725	0.00017		6e-05		0.00033
ngp	Ngulu	7956	0.97885	0.00039		0.00011		0.00055
ngt	Kriang	19						
ngu	Guerrero Nahuatl	118903	0.9935	0.00017				0.00011
nhd	Chiripá	15822	0.83343	0.00033				
nhe	Eastern Huasteca Nahuatl	7941	0.94	0.00165				
nhg nhi	Tetelcingo Nahuatl Zacatlán-Ahuacatlán-Tepetzintla Nahuatl	7906 7911	0.998 0.99749	0.0 0.0				
nhk	Isthmus-Cosoleacaque Nahuatl	4466	0.8986	0.00014				0.00055
nho	Takuu	7908	0.9995	3e-05				0.00055
nhr	Naro	7906	1.0	0.0				
nhu	Noone	7919	0.999	3e-05				
nhw	Western Huasteca Nahuatl	7942	0.93259	0.00146				
nhx	Isthmus-Mecayapan Nahuatl	9954	0.999	6e-05				
nhy nia	Northern Oaxaca Nahuatl Nias	7931 205435	0.996 0.9985	0.00011 6e-05				0.00022
nif	Nek	3713	1.0	0.0				0.00022
nii	Nii	7794	1.0	0.0				
nij	Ngaju	7879	0.99399	0.00011				
nim	Nilamba	7948	0.998	3e-05		6e-05		
nin	Ninzo	7915	0.9995	3e-05				
niq	Nandi	35203	0.9975	8e-05				0.00427
niu	Niuean	565376	0.9975	6e-05			1.0	0.0
niv niy	Gilyak Ngiti	20 7950	1.0	0.0				
njb	Nocte Naga	7888	0.9995	3e-05				
njm	Angami Naga	30987	0.99699	0.0				
njn	Liangmai Naga	30075	0.99502	0.00025				
njo	Ao Naga	30939	0.997	6e-05			0.95312	0.0
njz	Nyishi	7935	0.9995	0.0				0.00142
nka	Nkoya	73	0.36364	0.0				0.00055
nki nko	Thangal Naga	7955 7825	0.98123 0.9995	0.00011 3e-05				0.00055
nla	Nkonya Ngombale	312	0.9993	3e-05				0.00022
nlc	Nalca	7873	1.0	0.0				0.00022
nld	Dutch	4208335	0.76911	0.01612	0.99803	0.00023	0.70238	0.00547
nlv	Orizaba Nahuatl	14						
nma	Maram Naga	7934	1.0	0.0				
nmf	Tangkhul Naga (India)	30939	0.996	8e-05		6e-05		
nmh	Monsang Naga	7951	0.9985	0.0				0.00041
nmo	Moyon Naga	7950	0.9985	6e-05				0.00044
nmw nmz	Nimoa Nawdm	1220 7874	1.0 0.999	0.0 0.0				0.00033
nmz nnb	Nawdm Nande	80966	0.999	0.00033		0.00386		0.00033
						0.00500		0.00109
	Maring Naga	7955	1.0	0.0				
nng nnh	Maring Naga Ngiemboon	7955	1.0	0.0				

Table 20: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 16)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
nno	Norwegian Nynorsk	463877	0.98089	0.00036	0.98507	0.00045	0.95868	0.00033
nnp	Wancho Naga	7948	1.0	0.0				0.00011
nnq	Ngindo Southern Nuni	7940 7874	0.99649 1.0	6e-05 0.0				
nnw noa	Woun Meu	15760	0.9995	0.0				0.00011
nob	Norwegian Bokmål	2890508	0.96898	0.00129	0.98185	0.00148	0.98462	0.00011
nog	Nogai	9743	0.99649	3e-05				
non	Old Norse	21						
nop	Numanggang	12584	0.9985	6e-05				
nor	Norwegian	1000000	0.997	6e-05			0.07201	0.0
not nou	Nomatsiguenga Ewage-Notu	7819 7758	0.998 0.9995	3e-05 0.0			0.97391	0.0
nov	Novial	430	0.71579	0.00011				0.00033
nph	Phom Naga	7947	0.999	0.0				
npi	Nepali (individual language)	99103	0.98559	0.00058	0.99104	0.00011	0.98214	0.0
npl	Southeastern Puebla Nahuatl	14454	0.99601	0.00017				
npo	Pochuri Naga	7954	0.999	3e-05				
npy	Napu	7750	0.9985	3e-05				
nre	Southern Rengma Naga	30149 1066	0.998	8e-05 0.0				0.00022
nrf nri	Jèrriais Chokri Naga	7954	0.98339 0.99498	6e-05				0.00022
nsa	Sangtam Naga	7931	1.0	0.0				
nse	Nsenga	106988	0.99047	0.00017		0.0004		0.00011
nsm	Sumi Naga	30168	0.9965	0.00011				
nsn	Nehan	7887	0.999	3e-05				
nso	Pedi	2010451	0.99253	0.00033	0.99704	0.00028	0.86957	0.00197
nss	Nali	2204	0.99849	0.0				
nst	Tase Naga	30918	0.9975	3e-05				
nsu ntp	Sierra Negra Nahuatl Northern Tepehuan	7903 7753	0.99599 1.0	3e-05 0.0				
ntr	Delo	7896	0.9995	0.0				0.00088
nus	Nuer	16408	0.9985	0.0	0.99951	0.0		0.00011
nuy	Nunggubuyu	8201	0.998	3e-05				
nvm	Namiae	7255	1.0	0.0				
nwb	Nyabwa	7725	0.9985	0.0				
nwi	Southwest Tanna	7454	0.9995	0.0				
nwx	Middle Newar	11272	0.99649	6e-05				
nxd nya	Ngando (Democratic Republic of Congo) Nyanja	7948 2582911	0.9975 0.93803	6e-05 0.0036	0.99753	0.00023	0.96414	0.00099
nyf	Giryama	8144	0.98947	0.00022	0.77133	6e-05	0.70414	0.000
nyk	Nyaneka	297246	0.98166	0.00074		0.0046		0.00066
nyn	Nyankole	236252	0.98166	0.00074		6e-05	0.85938	0.0
nyo	Nyoro	7946	0.98286	0.00025				
nyu	Nyungwe	176938	0.99052	0.00033				
nyy	Nyakyusa-Ngonde	110073	0.99102	0.0003		0.00034		0.00055
nzb	Njebi Nzima	70 384511	0.6 0.9985	0.0 8e-05		6e-05	1.0	0.00011
nzi nzm	Zeme Naga	30978	0.9985	3e-05			1.0	0.0
oar	Old Aramaic (up to 700 BCE)	22	0.7713	30-03				
obo	Obo Manobo	7651	0.9975	3e-05				
oci	Occitan (post 1500)	135269	0.98549	0.00039	0.99951	6e-05	0.41101	0.0
ofs	Old Frisian	13						
ogo	Khana	61553	0.999	6e-05				
ojb 	Northwestern Ojibwa	36949	0.70851	0.01862			0.81481	0.0
oji	Ojibwa Severn Ojibwa	7989 7937	0.999	0.0				0.00066
ojs oke	Okpe (Southwestern Edo)	64083	0.9843	8e-05				0.00011
okv	Orokaiva	7780	1.0	0.0				0.00011
old	Mochi	7955	0.98808	0.00052		0.00023		0.00044
omw	South Tairora	9414	0.9995	0.0				
ong	Olo	7881	0.9995	3e-05				
ons	Ono	15076	1.0	0.0		6 05		0.00011
ood	Tohono O'odham	7563 7657	0.99699	0.0		6e-05		
opm ori	Oksapmin Oriya (macrolanguage)	7657 100397	0.999 0.9995	0.0				
orm	Oromo	489160	0.9995	3e-05		6e-05		
orv	Old Russian	1307	0.94602	3e-05		00-03		
ory	Odia	122527	0.9995	3e-05	1.0	0.0		
osp	Old Spanish	23						
	Ossetian	630164	0.99502	0.00028			0.5	0.00679
oss						0.000.00		0.00011
ota	Ottoman Turkish (1500-1928)	2287	0.81188	8e-05		0.00267		0.00011
ota ote	Ottoman Turkish (1500-1928) Mezquital Otomi	58835	0.92369	0.00237		0.00267	0.0	0.00011
ota	Ottoman Turkish (1500-1928)					0.00267	0.0	

Table 21: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 17)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	$\mathbf{FPR}\!\!\downarrow$	F1↑	$\mathbf{FPR} \!\!\downarrow$	F1↑	FPR↓
ots	Estado de México Otomi	13242	0.95737	0.00041				0.0046
otw	Ottawa	108	1.0	0.0				0.00044
oym	Wayampi	7693	0.9995	3e-05				
ozm	Koonzime	7891	1.0	0.0				
pab	Parecís	7936	0.9995	3e-05				
pad	Paumarí	7771	1.0	0.0	0.00053	0.0		0.00022
pag	Pangasinan	1255155	0.99452	0.00025	0.99852	0.0		0.00033
pah	Tenharim	7699	0.9995	0.0				
pam	Pampanga	19422	0.98532	6e-05			1.0	0.0
pan	Panjabi	722260	1.0	0.0	1.0	0.0	1.0	0.0
pao	Northern Paiute	7028	0.999	6e-05				
pap	Papiamento	1601687	0.97782	0.00102	0.99069	0.00102	0.79195	0.00339
pau	Palauan	181209	0.99751	0.00014			0.97436	0.0
pbb	Páez	12673	0.81626	0.00333			0.7125	0.00482
pbc	Patamona	7939	0.9995	0.0				0.00011
pbi	Parkwa	7849	1.0	0.0				0.00011
pbl	Mak (Nigeria)	7924	0.38695	0.00242	0.04406	0.000.51		0.00011
pbt	Southern Pashto	63256	0.96663	0.00061	0.81486	0.00051		0.00109
pcd	Picard	1348	0.89552	0.0				
pck	Paite Chin	30968	0.97284	0.0011				0.00033
pcm	Nigerian Pidgin	8364	0.97864	0.00011			0.71739	0.0
pdc	Pennsylvania German	11954	0.94379	0.00066				
odt	Plautdietsch	152305	0.998	8e-05				
em	Phende	9968	0.99649	3e-05		0.00034		0.00044
pes	Iranian Persian	2814370	0.80032	0.01356	0.57435	0.08493	0.65922	0.00668
pfe	Pere	10404	0.9995	3e-05				0.00044
flo	Pfaelzisch	10003	0.96516	0.00028				0.00011
phm	Phimbi	45602	0.98943	0.00011		0.00017		0.00011
phn	Phoenician	15						
pib	Yine	7937	0.999	0.0				
pid	Piaroa	7255	0.47033	0.00085				
pio	Piapoco	7655	1.0	0.0				
pir	Piratapuyo	7740	0.9995	3e-05				
ois	Pijin	703022	0.998	0.00011			0.9916	0.0
pis pjt	Pitjantjatjara	10949	1.0	0.00			0.5510	0.00547
pkb	Pokomo	7824	0.9985	6e-05				0.00022
		8729	1.0	0.0				0.00022
plg	Pilagá Pali	2	1.0	0.0				0.00011
pli -1-			0.96927	0.00286				0.00011
pls	San Marcos Tlacoyalco Popoloca	23439	0.86827	0.00286	0.00052	0.0	0.00102	0.00011
plt	Plateau Malagasy	202954	0.99552	0.00022	0.99852	0.0	0.98182	0.0
plu	Palikúr	8749	0.999	0.0		0.00011		0.0012
plw	Brooke's Point Palawano	7940	0.9995	3e-05				
pma	Paama	15067	0.999	6e-05				
pmf	Pamona	7956	0.9985	0.0				
pms	Piemontese	30824	0.98993	8e-05				0.00033
pmx	Poumei Naga	30182	0.99549	6e-05				
pnb	Western Panjabi	300035	0.9762	0.0003		0.00102	0.65969	0.00668
pne	Western Penan	7928	0.999	0.0				
poe	San Juan Atzingo Popoloca	19275	0.9995	0.0				
poh	Poqomchi'	41239	0.998	0.0				0.00011
poi	Highland Popoluca	17342	0.7267	0.00613				0.00011
pol	Polish	4592867	0.9621	0.00187	0.9907	0.00108	0.7362	0.00471
pon	Pohnpeian	431877	0.997	0.00011			1.0	0.0
por	Portuguese	5403043	0.82411	0.01166	0.99655	0.0004	0.84806	0.00471
pot	Potawatomi	2078	1.0	0.0				
pov	Upper Guinea Crioulo	28501	0.99147	0.00014		0.00233	0.96552	0.0
poy	Pogolo	7955	0.9975	8e-05		0.00200	0.70222	0.0
poy ppk	Uma	7760	0.999	3e-05				
ppk ppl	Pipil	59	0.999	0.0			0.42105	0.0
ppo	Folopa	7679	1.0	0.0			0. F21UJ	0.0
	San Luís Temalacayuca Popoloca	7950	0.9995	3e-05				0.00055
pps								0.00033
prf	Paranan	7865	0.9985	0.0				
prg	Prussian	1088	0.96067	0.0				
pri	Paicî	6986	1.0	0.0				
prk	Parauk	8909	0.63062	0.0014	0.47505	0.0		0.00=:-
prs	Dari	93926	0.80441	0.00083	0.14688	0.0192	0.0	0.00547
pse	Central Malay	7905	0.9985	0.0				
ptp	Patep	7918	0.999	0.0				
ptu	Bambam	7808	0.99649	6e-05				0.00077
pua	Western Highland Purepecha	7950	0.52827	0.00077				
pua	Pushto	30046	0.88156	3e-05				
pus		7914	0.99551	0.00019				
pus pwg	Gapapaiwa	7914 30880	0.99551 1.0	0.00019				
pus pwg pww qub		7914 30880 64459	0.99551 1.0 0.81356	0.00019 0.0 0.00715		6e-05		0.02704

Table 22: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 18)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
que	Quechua	694846	0.97263	0.0014			0.9916	0.0
quf	Lambayeque Quechua	8072	0.98582	3e-05		6e-05		0.00394
qug	Chimborazo Highland Quichua	160594	0.84767	0.00787			0.0375	0.0
quh	South Bolivian Quechua	46618	0.81818	0.00861		0.00028	0.92174	0.00044
qul	North Bolivian Quechua	15852	0.77368	0.00223		6e-05		0.00011
qup	Southern Pastaza Quechua	7700	0.99701	0.00014				0.0093
qus	Santiago del Estero Quichua	6856	0.99649	0.0				0.00208
quw	Tena Lowland Quichua	33203	0.67937	0.01062	0.75004	0.0	0.67402	0.00055
quy	Ayacucho Quechua	457040	0.97855	0.00066	0.75904	0.0	0.67403	0.00646
quz	Cusco Quechua	347402	0.9414	0.00281		0.02176	0.54822	0.00898
qva	Ambo-Pasco Quechua	7824 7799	0.98297 0.998	0.00041 6e-05		6e-05	0.0 0.92035	0.00011
qvc qve	Cajamarca Quechua Eastern Apurímac Quechua	7924	0.998	0.0		06-03	0.92033	0.00033
qve qvh	Huamalíes-Dos de Mayo Huánuco Quechua	7304	0.98799	0.0003			0.0	0.00022
qvii qvi	Imbabura Highland Quichua	227687	0.97923	0.0003			0.0	0.00022
qvm	Margos-Yarowilca-Lauricocha Quechua	7299	0.9824	0.00033			0.15385	0.0
qvni qvn	North Junin Quechua	7948	0.9945	0.00017			0.31884	0.0
qvo	Napo Lowland Quechua	7853	0.99198	0.00017			0.51001	0.00011
qvs	San Martín Quechua	7872	0.99649	3e-05				0.00252
qvw	Huaylla Wanca Quechua	16232	0.77036	0.00239				0.00055
qvz	Northern Pastaza Quichua	8730	0.94858	6e-05				0.00011
qwh	Huaylas Ancash Quechua	7834	0.997	6e-05			0.48276	0.00066
qxh	Panao Huánuco Quechua	7727	0.99247	0.00011				
qxl	Salasaca Highland Quichua	7876	0.9995	3e-05				
qxn	Northern Conchucos Ancash Quechua	7937	0.98087	0.00033			0.03333	0.00011
qxo	Southern Conchucos Ancash Quechua	7421	0.97364	0.00088				
qxq	Qashqa'i	14						
qxr	Cañar Highland Quichua	9639	0.9646	0.00025				
qya	Quenya	144	0.28571	3e-05				
rad	Rade	30874	0.9975	6e-05				
rai	Ramoaaina	7828	0.9995	0.0				
rap	Rapanui	16603	0.57556	0.00776				0.00011
rar	Rarotongan	920894	0.98958	0.0005			0.99174	0.00011
rcf	Réunion Creole French	13290	0.98891	8e-05		0.00045		0.00022
rhg	Rohingya	3850	0.98712	3e-05		0.00028		0.00142
ria	Riang (India)	7947	0.9985	0.0				
rif	Tarifit	227	0.43137	6e-05				
rim	Nyaturu	7954	0.9995	3e-05				
rkb	Rikbaktsa	7766	0.999	3e-05				
rmc	Carpathian Romani	8938	0.99649	6e-05				
rme	Angloromani Baltic Romani	168 4828	0.76923 0.73838	0.0 0.00028		6e-05		0.00077
rml	Balkan Romani	338459	0.73636	8e-05		6e-05	0.86636	0.00077
rmn rmo	Sinte Romani	11235	0.99749	0.0		0.00011	0.80030	0.00011
	Caló	2273	0.99749	0.0		0.00011		
rmq	Vlax Romani	96254	0.99341	0.00184		6e-05		0.00394
rmy rnd	Ruund	29279	0.91893	3e-05		0.00011		0.00334
rng	Ronga	77778	0.9853	3e-05		0.00011		0.00044
rnl	Ranglong	10406	0.994	0.00017				0.0001
roh	Romansh	30149	0.9945	0.00017			0.99268	0.0
rom	Romany	876	0.44602	0.00828			0.55200	0.0
ron	Romanian	1542662	0.98327	0.00020	0.99951	0.0	0.80992	0.00493
roo	Rotokas	7890	1.0	0.0	0.77751	0.0	0.00//2	0.00172
rop	Kriol	29167	0.998	6e-05				
rro	Waima	7946	0.999	3e-05				0.00011
rtm	Rotuman	11052	0.9985	0.0				0.00011
rub	Gungu	7912	0.999	0.0				0.0001
rue	Rusyn	10117	0.95084	8e-05				
ruf	Luguru	7951	0.99649	6e-05		6e-05		
run	Rundi	1361196	0.96652	0.00094	0.92541	0.00881	0.87591	0.00186
rup	Macedo-Romanian	2219	0.99573	3e-05			0.125	0.0
rus	Russian	9074266	0.65357	0.02904	0.99901	6e-05	0.43321	0.01718
rwo	Rawa	15237	0.9995	3e-05				
ryu	Central Okinawan	42						
sab	Buglere	7507	0.999	0.0				
sag	Sango	1017526	0.99552	0.00025	0.99901	0.0	0.81553	0.0
sah	Yakut	115824	0.98601	0.00041			0.53881	0.01106
san	Sanskrit	147128	0.97656	0.00072	0.99104	6e-05	0.66667	0.0
sas	Sasak	7890	0.9985	3e-05				
sat	Santali	21927	1.0	0.0	1.0	0.0		
sba	Ngambay	30900	0.9995	0.0				
sbd	Southern Samo	7909	0.9975	3e-05				0.00011
sbe	Saliba	6215	0.998	6e-05				
	D + 1 C 1 1		1.0	0.0				
sbl	Botolan Sambal	7848	1.0	0.0				

Table 23: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 19)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	$\mathbf{FPR}\!\!\downarrow$	F1↑	FPR↓
sby	Soli	208	0.95833	0.0				0.00022
sck	Sadri	29	0.0000	0.00074	0.00000	6.05		0.00262
scn	Sicilian	62549	0.96888	0.00074	0.99802	6e-05	0.02692	0.00263
sco	Scots	101211	0.97563	0.00025		0.00028	0.92683	0.00044 0.00011
sda sdh	Toraja-Sa'dan Southern Kurdish	8864 1048	0.99198 0.93968	0.00017 0.0				0.00011
sdo	Bukar-Sadung Bidayuh	787	0.93908	3e-05				
seh	Sena	301781	0.98462	0.00063		0.00034		
ses	Koyraboro Senni Songhai	12790	0.9955	0.00011		0.00051		
sey	Secoya	7912	1.0	0.0			0.02985	0.00044
sfw	Sehwi	10131	0.99548	0.0				0.00033
sgb	Mag-antsi Ayta	7857	0.998	8e-05				
sgh	Shughni	717	1.0	0.0				0.00077
sgs	Samogitian	10047	0.98889	3e-05		6e-05		
sgw	Sebat Bet Gurage	7909	0.99749	0.0				
sgz	Sursurunga	7745	0.9995	3e-05		0.00011		
shi	Tachelhit	10669	0.98226	0.00011		0.00011	0 00000	0.0
shk shn	Shilluk Shan	7907 24569	1.0 1.0	0.0	1.0	0.0	0.88889 0.99145	0.0
shp	Shipibo-Conibo	9806	0.9995	3e-05	1.0	0.0	0.99143	0.0
shr	Shi	14876	0.9993	0.0005		0.00011	0.27397	0.0
shs	Shuswap	95	0.8125	0.0		0.00011		
shu	Chadian Arabic	7923	0.998	6e-05		0.00835		0.0012
shy	Tachawit	247	0.27907	0.0		0.00000		0.0012
sid	Sidamo	130089	0.999	6e-05			0.90625	0.00131
sig	Paasaal	7893	0.998	3e-05				0.00011
sil	Tumulung Sisaala	7868	0.99649	0.0				
sim	Mende (Papua New Guinea)	7790	0.9995	3e-05				0.00033
sin	Sinhala	554048	1.0	0.0	1.0	0.0	1.0	0.0
sja	Epena	7870	0.9995	0.0				
sjn	Sindarin	92	0.33333	3e-05				
skg	Sakalava Malagasy	56311	0.9955	0.00011		0.00011		0.00022
skr	Saraiki	134	0.51429	3e-05				0.0025
sld	Sissala	7906	0.999	6e-05	0.00053	6 05	0.06057	0.0035
slk sll	Slovak	3544374	0.97476	0.00099	0.99852	6e-05	0.86957	0.00197
slv	Salt-Yui	7869 4072739	0.999 0.96881	3e-05 0.0016	0.99459	0.00062	0.88889	0.00164
sma	Slovenian Southern Sami	4072739 59	0.83333	0.0016	0.99439	0.00062	0.00009	0.00104
sme	Northern Sami	18205	0.83333	6e-05		6e-05	0.96667	0.00022
smk	Bolinao	7859	0.9985	3e-05		00-03	0.70007	0.00022
sml	Central Sama	7891	0.9995	0.0		6e-05		
smo	Samoan	1640628	0.99352	0.00025	0.99603	0.0	1.0	0.0
smt	Simte	7953	0.99247	8e-05				
sna	Shona	2150482	0.98521	0.0008	0.99901	0.00011	0.93846	0.00088
snc	Sinaugoro	7926	1.0	0.0				
snd	Sindhi	132171	0.9985	0.0	0.99362	0.00074		
snf	Noon	7907	0.99599	3e-05				0.0012
snn	Siona	7892	1.0	0.0			0.60773	0.0
snp	Siane	15669	0.999	0.0				0.00022
snw	Selee	7890	1.0	0.0				
sny	Saniyo-Hiyewe	7848	1.0	0.0				0.00011
soe	Songomeno	1127	0.96988	3e-05	0.06657	0.00200	0.75017	0.00011
som	Somali	227769 208326	0.99649 0.9955	6e-05	0.96657	0.00398	0.75817	0.00405
sop	Songe Kanasi	10512	0.9955	0.00011 3e-05		0.00011		0.00055 0.00022
soq sot	Southern Sotho	2131930	0.99305	0.00039	1.0	0.0	0.98333	0.00022
soy	Miyobe	7920	1.0	0.00037	1.0	0.0	0.76555	0.00011
spa	Spanish	2583672	0.50519	0.05363	0.99508	0.00057	0.71681	0.00679
spl	Selepet	7031	0.9995	3e-05	0.77500	0.00037	0.71001	0.00077
spm	Akukem	1622	0.99785	0.0				
spp	Supyire Senoufo	7847	0.9985	6e-05				
sps	Saposa	8166	0.999	0.0				
spy	Sabaot	15366	1.0	0.0				
sqi	Albanian	326340	0.999	6e-05				
srd	Sardinian	53845	0.93574	6e-05	0.99951	0.0		
sri	Siriano	7808	0.9985	0.0				
srm	Saramaccan	75703	0.9975	6e-05				0.00055
srn	Sranan Tongo	1166639	0.99107	0.00047				
srp	Serbian	1390294	0.98142	0.00039	0.99901	0.00011	0.5124	0.00657
srq	Sirionó	7814	0.9995	0.0				
srr	Serer	3524	0.99191	0.0			0.89231	0.00131
ssd	Siroi	10880	0.9965	0.00011				
ssg	Seimat	7891	0.998	3e-05	0.00.55	0.005	0.045-:	0.005
	Swati	426339	0.97691	0.00052	0.99654	0.00023	0.94891	0.00066
SSW SSX	Samberigi	9408	1.0	0.0			0.71071	0.00011

Table 24: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 20)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
stn	Owa	7884	0.9985	6e-05				
stp	Southeastern Tepehuan	7918	1.0	0.0				0.00022
stq	Saterfriesisch	10507	0.99147	0.00014				
sua	Sulka Western Subanon	7558 7896	0.999 0.999	3e-05 0.0				
suc sue	Suena	7882	0.999	8e-05				
suk	Sukuma	8083	0.99599	3e-05		6e-05	0.68712	0.00514
sun	Sundanese	109886	0.98094	0.00044	0.99012	0.00057	0.9697	0.00033
sur	Mwaghavul	7952	0.999	3e-05				
sus	Susu	11639	0.99449	8e-05		6e-05	0.92683	0.00088
sux	Sumerian	183	0.92754	0.0				
suz	Sunwar	30868	0.9985	0.0				
swa	Swahili (macrolanguage)	100000	0.998	8e-05		6e-05	0.50125	0.00074
swb	Maore Comorian	1412	0.97387	0.00011		0.00400	0.79137	0.00274
swc swe	Congo Swahili Swedish	452844 3997074	0.9025 0.96724	0.00454 0.00154	0.99754	0.00409 0.00028	0.86301	0.00285 0.00219
swg	Swabian	9915	0.97724	0.00134	0.77134	0.00026	0.00501	0.00217
swh	Swahili (individual language)	370928	0.9401	0.00267	0.94869	0.00187	0.84956	0.00044
swk	Malawi Sena	7727	0.98992	6e-05	0.5 .005	0.00107	0.0.750	0.00011
swp	Suau	11467	0.997	0.00011				
sxb	Suba	7906	0.998	0.0				0.00011
sxn	Sangir	51443	0.995	0.00014				
syb	Central Subanen	7644	0.999	3e-05				
syc	Classical Syriac	7926	1.0	0.0				0.00635
syl	Sylheti	15	1.0	0.0				
szb	Ngalum	7940	1.0	0.0	0.00104	C - 05		
szl	Silesian	57496	0.99247 0.999	0.00011	0.99104	6e-05		
tab tac	Tabassaran Lowland Tarahumara	7851 11398	0.999	3e-05 0.0				
tah	Tahitian	1185188	0.99255	0.00039			0.91892	0.00011
taj	Eastern Tamang	7884	0.9995	0.0			0.66667	0.0
tam	Tamil	1581134	1.0	0.0	1.0	0.0	1.0	0.0
tap	Taabwa	216	0.875	0.0		0.00011		
taq	Tamasheq	24410	0.90069	0.00325	0.80642	0.02022		0.00438
tar	Central Tarahumara	25433	0.98077	0.00019				0.00022
tat	Tatar	372101	0.98657	0.00052	1.0	0.0	0.65556	0.00668
tav	Tatuyo	7676	0.9975	8e-05				
taw	Tai	7683	0.9985	6e-05				
tbc	Takia	7836	1.0	0.0				
tbg tbk	North Tairora	19510 7653	0.999 1.0	6e-05 0.0				
tbl	Calamian Tagbanwa Tboli	7806	0.9985	0.0				0.00011
tbo	Tawala	7895	0.99701	0.00014				0.00011
tby	Tabaru	7878	0.9995	3e-05				0.00011
tbz	Ditammari	30712	0.9995	3e-05			0.20896	0.0
tca	Ticuna	25611	0.81432	0.00393			0.9916	0.0
tcc	Datooga	7953	1.0	0.0				
tcf	Malinaltepec Me'phaa	125443	0.997	0.00011				0.00022
tcs	Torres Strait Creole	12298	0.99046	0.00014				
tcy	Tulu	10000	0.98219	0.0				
tcz	Thado Chin	44548	0.997	0.00011			0.66202	0.00646
tdt	Tetun Dili	450685	0.99056	0.00044 6e-05		C - 05	0.66292	0.00646
tdx ted	Tandroy-Mahafaly Malagasy Tepo Krumen	73631 7812	0.9975 0.999	6e-05		6e-05		
tee	Huehuetla Tepehua	7938	1.0	0.0				
tel	Telugu	634652	0.999	6e-05	1.0	0.0	1.0	0.0
tem	Timne	7951	1.0	0.0	1.0	0.0	0.97345	0.0
teo	Teso	36835	0.99451	0.00019				0.00044
ter	Tereno	8019	0.999	3e-05				
tet	Tetum	9162	0.99197	0.00011				
tew	Tewa (USA)	4831	1.0	0.0				
tfr	Teribe	7534	0.9995	0.0				
tgk	Tajik	232287	0.99599	3e-05	1.0	0.0	0.67429	0.00624
tgl	Tagalog	1391946	0.85393	0.00897	0.99901	0.00011	0.9403	0.00077
tgo	Sudest	8042	0.9995	0.0				
tgp	Tangoa	7927	0.999	0.0	1.0	0.0	1.0	0.0
tha	Thai	883065	0.99502	0.00028	1.0	0.0	1.0	0.0
thk thv	Tharaka Tahaggart Tamahag	7890 589	0.9995 0.66038	3e-05 0.0		0.00011 0.00182		0.00011
tnv tif	Tahaggart Tamahaq Tifal	7682	0.00038	0.0		0.00182		0.00011
tig	Tigre	3874	0.9983	3e-05		0.00125		
tih	Timugon Murut	7913	0.74834	3e-05		0.00123		
	C	7900	0.9995	0.0				
tik	HKar							
tik tim	Tikar Timbe	7791	0.9995	0.0				

 $Table\ 25:\ Performance\ of\ GlotLID-M\ on\ GlotLID-C\ test,\ FLORES-200\ and\ UDHR\ benchmarks\ (part\ 21)$ 

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
tiv	Tiv	481805	0.9965	0.00011			0.98551	0.00022
tiy	Tiruray	7896	1.0	0.0				0.00011
tke tkl	Takwane Tokelau	10656 629	0.99498 0.91026	6e-05 0.0				0.00011
tkr	Tsakhur	912	0.98932	0.0				
tku	Upper Necaxa Totonac	7936	0.99303	0.0003				
tlb	Tobelo	7902	0.999	3e-05				0.00011
tlf	Telefol	7676	0.9995	3e-05				
tlh	Klingon	55689	0.99498	6e-05		6e-05		
tlj	Talinga-Bwisi	7885	0.999	3e-05				
tll	Tetela	584747	0.99304	0.00036		0.00017		0.00011
tly	Talysh	66	0.57143	0.0			0.03175	0.0
tmd tmr	Haruai	7725 218	1.0 0.7	0.0				
tmw	Jewish Babylonian Aramaic Temuan	5	0.7	0.0				
tna	Tacana	7705	0.999	3e-05				
tnc	Tanimuca-Retuarã	3025	1.0	0.0				
tnk	Kwamera	7870	1.0	0.0				
tnn	North Tanna	7865	0.9975	3e-05				
tnp	Whitesands	7864	0.998	8e-05				
tob	Toba	39496	0.99599	6e-05			0.97561	0.00033
toc	Coyutla Totonac	7915	0.9985	6e-05				0.00011
tod	Toma	11025	0.996	8e-05				
tog	Tonga (Nyasa)	231197	0.99699	3e-05		0.00011		
toh	Gitonga	107233	0.995	0.00014		0.00011	1.0	0.0
toi	Tonga (Zambia) Tojolabal	746307 189077	0.98961 0.98953	0.00058 0.00036		0.00011 6e-05	1.0 0.83688	0.0 0.00022
toj tok	Toki Pona	52772	1.0	0.00030		06-03	0.03000	0.00022
ton	Tonga (Tonga Islands)	1234253	0.99502	0.00025			1.0	0.0
too	Xicotepec De Juárez Totonac	7940	0.99297	8e-05			1.0	0.0
top	Papantla Totonac	238408	0.99601	0.00017			0.97561	0.00033
tos	Highland Totonac	7906	0.998	3e-05				0.00022
tpa	Taupota	656	0.94792	8e-05				
tpi	Tok Pisin	1846778	0.99155	0.00039	0.99951	0.0	0.98361	0.00011
tpm	Tampulma	30663	0.997	8e-05				0.00066
tpp	Pisaflores Tepehua	7926	0.9995	3e-05		0.00011		
tpt	Tlachichilco Tepehua	7927 563	0.9995	0.0		6e-05		0.00011
tpw tpz	Tupí Tinputz	7846	0.90566 1.0	6e-05 0.0				0.00011
tqb	Tembé	30084	0.48998	0.01293				
trc	Copala Triqui	7881	1.0	0.01255				
trn	Trinitario	7840	1.0	0.0				0.00022
tro	Tarao Naga	7952	0.9995	0.0				
trp	Kok Borok	30861	0.998	8e-05				
trq	San Martín Itunyoso Triqui	7937	1.0	0.0				
tsc	Tswa	297653	0.99097	0.00017				0.00011
tsg	Tausug	7892	0.9995	3e-05				
tsn	Tswana	799821	0.94537	0.00303	0.99753	6e-05	0.98361	0.00022
tso	Tsonga Taishin aini	2723082 7902	0.97416 0.99699	0.00143	0.99803	0.00023	0.94158	0.00153
tsw tsz	Tsishingini Purepecha	132907	0.99699	3e-05 0.01735			0.81944	0.00274
ttc	Tektiteko	7954	1.0	0.01733			0.01744	0.00274
tte	Bwanabwana	7734	0.99551	0.00017				0.00200
ttj	Tooro	106342	0.97983	0.00102		0.00017		0.00175
ttq	Tawallammat Tamajaq	2766	0.98647	0.0				
tts	Northeastern Thai	55	0.5	0.0				0.00011
tuc	Mutu	15211	0.9995	3e-05				
tue	Tuyuca	7812	0.999	0.0				
tuf	Central Tunebo	7875	0.9985	3e-05				
tui	Tupuri	30989	0.998	3e-05	0.00000	0.00022	0.04021	0.001.40
tuk	Turkmen	696538	0.99601	0.00017	0.99803	0.00023	0.94821	0.00142
tum	Tumbuka	808156	0.99551	0.00019	0.99852	0.00011		
tuo tur	Tucano Turkish	15602 2439747	1.0 0.92159	0.0 0.00465	0.9907	0.00108	0.4918	0.01357
tuv	Turkana	2439747	0.89655	3e-05	0.5507	0.00108	0.4716	0.01337
tvk	Southeast Ambrym	13248	0.89033	0.0				0.00133
tvl	Tuvalu	520271	0.99206	0.00044				
twi	Twi	1934311	0.98668	0.00074	0.99951	0.0	0.95349	0.00131
twu	Termanu	7903	0.9975	0.00011				
twx	Tewe	31794	0.98376	3e-05				
txq	Tii	9062	0.997	8e-05				
txu	Kayapó	7661	1.0	0.0				
tyv	Tuvinian	147493	0.9945	0.00014			0.98361	0.00022
tzh	Tzeltal	223502	0.98949 0.99352	0.00028 0.00025			0.98333	0.00022
tzj	Tz'utujil	17101						0.00011

 $Table\ 26:\ Performance\ of\ GlotLID-M\ on\ GlotLID-C\ test,\ FLORES-200\ and\ UDHR\ benchmarks\ (part\ 22)$ 

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	<b>F1</b> ↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
tzl	Talossan	343	0.775	3e-05				
tzm	Central Atlas Tamazight	8142	0.88564	0.00292	0.94421	0.0054	0.01754	0.00569
tzo	Tzotzil	521363	0.9985	8e-05			0.97479	0.00011
ubr	Ubir	9424	0.9975	8e-05				
ubu	Umbu-Ungu	15261	0.9985	3e-05				
udm	Udmurt	95670	0.99053	0.00036				0.00022
udu	Uduk	7952	0.9995	0.0			0.98361	0.00022
uig	Uighur	118987	0.9995	0.0	0.99901	0.00011	0.89916	0.0012
ukr	Ukrainian	2374463	0.95992	0.00212	0.99951	6e-05	0.98361	0.00022
umb	Umbundu	646290	0.99301	0.00022	0.88585	0.00045	0.87931	0.00109
upv	Uripiv-Wala-Rano-Atchin	7916	0.998	6e-05				
ura	Urarina	7752	0.9985	3e-05			0.82963	0.0
urb	Urubú-Kaapor	7742	0.9995	0.0				
ırd	Urdu	775141	0.97065	0.00143	0.98346	0.00187	0.96522	0.00077
urh	Urhobo	181379	0.99302	0.00028				0.00011
ıri	Urim	2487	1.0	0.0				
ırk	Urak Lawoi'	7911	0.9995	0.0				
urt	Urat	7816	0.9985	0.0				
usa	Usarufa	8134	1.0	0.0				
usp	Uspanteco	7898	0.999	0.0				
uvh	Uri	7690	0.9995	0.0				
uvl	Lote	7908	0.999	0.0				
ızb	Uzbek	181303	0.999	6e-05				
ızn	Northern Uzbek	1516837	0.99054	0.00039	0.96885	0.00364	0.48819	0.00788
vag	Vagla	7938	0.9995	0.0				0.00011
vap	Vaiphei	30918	0.98504	0.0005				0.00011
var	Huarijio	7954	0.9975	3e-05				
vec	Venetian	124915	0.96296	0.00099	0.99703	6e-05	0.86957	0.00197
ven	Venda	806164	0.998	0.00011			1.0	0.0
vep	Veps	13						
vgt	Vlaamse Gebarentaal	9618	0.78372	3e-05				
vid	Vidunda	7943	0.99154	0.00036		0.00017		0.00022
vie	Vietnamese	2010052	0.99303	0.00033	0.99951	6e-05	0.66304	0.00011
viv	Iduna	7521	0.9985	3e-05				
vls	Vlaams	30000	0.97166	0.00044		0.00023		0.00011
vmk	Makhuwa-Shirima	1970	0.88306	0.0				0.00011
vmw	Makhuwa	306018	0.97205	0.00132		0.00011	0.95798	0.00022
vmy	Ayautla Mazatec	7941	0.999	0.0				0.00263
vol	Volapük	105178	0.99751	0.00014				0.00044
vro	Võro	10015	0.98739	0.00011				0.00328
vun	Vunjo	7951	0.99145	8e-05				
vut	Vute	7912	1.0	0.0				0.00328
waj	Waffa	7854	0.9985	0.0				
wal	Wolaytta	309841	0.98961	0.00058				0.00033
wap	Wapishana	14453	0.9985	0.0				0.00099
war	Waray (Philippines)	606273	0.99305	0.00039	0.99951	0.0	0.9916	0.0
wat	Kaninuwa	2596	0.99868	3e-05				
way	Wayana	7923	0.9995	0.0				
wba	Warao	388	0.97521	3e-05				0.00044
wbm	Wa	30852	0.76979	0.01416				0.00197
wbp	Warlpiri	10006	1.0	0.0				
vca	Yanomámi	7788	0.80093	0.00803				
wed	Wedau	1309	0.96658	0.00019				
wer	Weri	7854	1.0	0.0				0.00011
wes	Cameroon Pidgin	91652	0.94163	0.00267				0.00252
wew	Wejewa	884	0.98893	0.0				
whg	North Wahgi	977	0.9699	3e-05				0.00011
whk	Wahau Kenyah	7945	0.99548	3e-05				
wib	Southern Toussian	6982	0.9995	3e-05				
wim	Wik-Mungkan	7697	1.0	0.0				
viu	Wiru	7809	0.9995	0.0				0.00099
wln	Walloon	30053	0.99198	0.00014			0.62105	0.00777
wls	Wallisian	880578	0.99255	0.00039				
wlv	Wichí Lhamtés Vejoz	1809	0.9899	3e-05				0.00033
wmt	Walmajarri	1149	1.0	0.0				
wmw	Mwani	7940	0.99549	8e-05				0.00022
wnc	Wantoat	10243	0.999	0.0				
wnu	Usan	7720	1.0	0.0				
wob	Wè Northern	7924	0.9985	3e-05				
wol	Wolof	79608	0.97988	0.00039	0.99852	0.0	0.79747	0.0035
wos	Hanga Hundi	7811	0.97988	0.00039	0.77032	0.0	0.17141	0.0033
wos wrk	Garrwa	4838	0.999	3e-05				0.00011
	Waris	4838 8985	0.99862	0.0				
	77 dl 15	0703	0.999	0.0				
		12060	0.00701	0.00014				
wrs wsk wuu	Waskia Wu Chinese	13069 104765	0.99701 0.8768	0.00014 0.00033		0.00011	0.35811	0.01905

 $Table\ 27:\ Performance\ of\ GlotLID-M\ on\ GlotLID-C\ test,\ FLORES-200\ and\ UDHR\ benchmarks\ (part\ 23)$ 

			GlotI	ID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
wuv	Wuvulu-Aua	7938	0.998	0.0				
wwa	Waama	7901	0.9985	0.0			0.88636	0.0
xal	Kalmyk	8727	0.99147	0.00014				0.00022
xav	Xavánte	24284	0.78285	0.00803				0.00022
xbi xbr	Kombio Kambera	4326 7547	0.99924 0.999	0.0 0.0				
xed	Hdi	7945	0.9985	3e-05				0.00011
xho	Xhosa	1011828	0.98372	0.00083	0.99118	0.00097	0.93846	0.00011
xla	Kamula	9641	0.9995	3e-05	0.55110	0.00077	0.550.0	0.00000
xmf	Mingrelian	124528	0.99303	0.0003				
xmv	Antankarana Malagasy	76882	0.99699	3e-05		6e-05		0.00011
xnn	Northern Kankanay	7735	0.99649	3e-05				
xog	Soga	25897	0.99249	0.00017				
xon	Konkomba	15023	0.99651	0.00019				
xpe	Liberia Kpelle	31074	0.55157	0.00919				
xqa	Karakhanid	12	0.0005	2- 05				
xrb xsb	Eastern Karaboro Sambal	7887 7915	0.9995 0.997	3e-05 0.00011				
xsi	Sio	10302	1.0	0.00				0.00044
xsm	Kasem	7874	0.9985	6e-05				0.00044
xsr	Sherpa	7935	1.0	0.0				
xsu	Sanumá	7788	0.76697	0.00371				0.00011
xtd	Diuxi-Tilantongo Mixtec	8182	0.9985	3e-05				0.00044
xtm	Magdalena Peñasco Mixtec	7929	0.9985	0.0				0.00427
xtn	Northern Tlaxiaco Mixtec	14968	0.9985	8e-05				
xuo	Kuo	7884	0.999	3e-05				
yaa	Yaminahua	7622	1.0	0.0				
yad	Yagua	7454	1.0	0.0			0.88889	0.0
yal	Yalunka	7932	0.998	0.0				0.00055
yam	Yamba	7927	0.9995	0.0				
yan	Mayangna	30722	0.99449	8e-05		6e-05	0.07245	0.00022
yao	Yao	204519 352203	0.99701 0.99651	0.00014 0.00017		6e-03	0.97345 0.96721	0.00022 0.00022
yap	Yapese Yaqui	7934	1.0	0.00017			0.90721	0.00022
yaq ybb	Yemba	8028	0.91398	0.00028				0.00197
yby	Yaweyuha	7883	0.999	0.0				0.00177
ycn	Yucuna	7857	0.9995	0.0				
ydd	Eastern Yiddish	911	0.99661	0.0	0.99603	0.0	0.99187	0.0
yid	Yiddish	44101	0.99497	0.0				
yim	Yimchungru Naga	30883	0.99548	3e-05				
yka	Yakan	8455	0.9975	3e-05				
ykg	Northern Yukaghir	20						
yle	Yele	7585	0.9995	0.0		6e-05		
yli ,	Angguruk Yali	7905	0.999	3e-05				0.00088
yml	Iamalele	7317	0.9985	0.0		6 05		0.00646
yom	Yombe	77077	0.98856	0.00047		6e-05		0.00646
yon	Yongkom Yoruba	11798 1812160	0.9995 0.99206	0.0 0.00041	0.99406	0.00023	0.85106	0.00022 0.0023
yor yrb	Yareba	7117	0.99200	8e-05	0.55400	0.00023	0.05100	0.0023
yre	Yaouré	7908	1.0	0.0				
yrk	Nenets	1908	0.99112	3e-05			0.8381	0.00011
yrl	Nhengatu	7439	0.9322	0.00022				
yss	Yessan-Mayo	15808	0.999	6e-05				
yua	Yucateco	616290	0.99701	0.00014			1.0	0.0
yue	Yue Chinese	64647	0.9549	0.00022	0.00394	0.0	0.46897	0.00449
yuj	Karkar-Yuri	7845	0.9995	0.0				
yup	Yukpa	329	0.96078	3e-05				0.00077
yut	Yopno	10245	1.0	0.0				
yuw	Yau (Morobe Province)	7846	0.999	6e-05				
yuz	Yuracare	7826	1.0	0.0				0.00011
yva	Yawa	7651	0.9995	3e-05				0.00011
zaa	Sierra de Juárez Zapotec	7891	1.0 0.99549	0.0				
zab zac	Western Tlacolula Valley Zapotec Ocotlán Zapotec	9862 7941	0.99349	6e-05 0.0				
zad	Cajonos Zapotec	7938	1.0	0.0				0.00033
zae	Yareni Zapotec	7916	0.999	6e-05				0.00033
zai	Isthmus Zapotec	276740	0.98903	0.00039				0.00055
zam	Miahuatlán Zapotec	7943	0.9995	3e-05			0.0	0.00011
zao	Ozolotepec Zapotec	7940	0.998	3e-05				0.00109
zar	Rincón Zapotec	7919	0.9975	8e-05				
zas	Santo Domingo Albarradas Zapotec	7928	0.9995	3e-05				0.00131
zat	Tabaa Zapotec	7938	1.0	0.0				
zav	Yatzachi Zapotec	11233	0.87575	0.00099				0.00088
	MCd 77	7951	0.9995	0.0				
zaw	Mitla Zapotec Coatecas Altas Zapotec	7938	1.0	0.0				0.00022

Table 28: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 24)

			GlotI	LID-C	FLOR	ES-200	UD	HR
iso639-3	Language	Sentences		FPR↓		FPR↓	F1↑	FPR↓
zdj	Ngazidja Comorian	2097	0.97484	6e-05		0.00011	0.78125	0.00208
zea	Zeeuws	10012	0.91037	0.00025		0.00045		
zgh	Standard Moroccan Tamazight	3285	0.93333	0.00039		0.00068	0.17647	0.0
zho	Chinese	4212269	0.998	0.0	1.0	0.0		
zia	Zia	7893	0.99749	0.0				
ziw	Zigula	7957	0.97857	0.00069				
zlm	Malay (individual language)	2260	0.86341	3e-05			0.0	0.00011
zne	Zande (individual language)	315310	0.99053	0.00036				0.00219
zom	Zou	30810	0.64431	0.0192				0.0012
zos	Francisco León Zoque	7953	0.999	0.0				
zpa	Lachiguiri Zapotec	67840	0.75362	0.01389				0.00055
zpc	Choapan Zapotec	7914	0.999	0.0				
zpd	Southeastern Ixtlán Zapotec	106	0.82927	3e-05				0.0023
zpf	San Pedro Quiatoni Zapotec	94	1.0	0.0				0.00208
zpg	Guevea De Humboldt Zapotec	1020	0.98462	0.0				
zpi	Santa María Quiegolani Zapotec	7856	0.999	6e-05				0.00011
zpj	Quiavicuzas Zapotec	124	0.89362	0.0				0.00077
zpl	Lachixío Zapotec	7953	0.999	3e-05				
zpm	Mixtepec Zapotec	7695	0.9995	0.0				0.00033
zpo	Amatlán Zapotec	7913	0.9985	3e-05				0.00033
zpq	Zoogocho Zapotec	7889	0.99649	3e-05				
zpt	San Vicente Coatlán Zapotec	7929	1.0	0.0				0.00383
zpu	Yalálag Zapotec	7935	0.999	0.0				
zpv	Chichicapan Zapotec	7946	1.0	0.0				0.00438
zpz	Texmelucan Zapotec	7936	0.9995	0.0				
zsm	Standard Malay	445673	0.9223	0.00168	0.93506	0.00307		0.0081
zsr	Southern Rincon Zapotec	7918	0.998	0.0				
ztq	Quioquitani-Quierí Zapotec	7898	1.0	0.0				0.00011
ztý	Yatee Zapotec	7908	0.999	6e-05				
zul	Zulu	990448	0.99295	0.0	0.96893	0.0	0.98305	0.0
zyb	Yongbei Zhuang	10631	0.9985	0.0			0.912	0.00066
zyp	Zyphe Chin	7934	0.999	0.0				0.00011
zza	Zaza	1713	0.936	0.0				

Table 29: Performance of GlotLID-M on GlotLID-C test, FLORES-200 and UDHR benchmarks (part 25)

									wi	th confiden	ce threshol	d θ		
			GlotI	ID-M	CI	.D3	GlotLII	<b>9-M</b> θ=.3	GlotLII	<b>)-M</b> θ=.5	CLD	3 θ=.5	CLD	3 θ= <b>.</b> 7
iso639-3	FLORES Code(s)	CLD3 Code(s)	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
ace afr	ace afr	- of	0.95757 1.0	0.01099 0.0	0.86863	0.00308	0.95732 1.0	0.00984	0.95689 1.0	0.00788	0.88042	0.00275	0.91091	0.00188
aka	aka/twi	af -	0.99876	0.00012			0.99901	0.0	0.99901	0.0				
amh ara	amh arz/ars/acm/ary/aeb/acq/apc/arb/ajp	am ar	0.99951 0.93244	0.00012 0.06061	0.66579 0.88458	0.01046 0.0137	0.99951 0.92725	0.00011 0.0542	0.99951 0.92631	0.0001 0.04535	0.66579 0.89253	0.01043 0.01176	0.66579 0.90924	0.0102 0.00751
asm ast	asm ast	-	1.0 0.99209	0.0			1.0 <b>0.99308</b>	0.0	1.0 0.99257	0.0 0.00049				
awa	ast	-	0.38951	0.00012			0.38982	0.0	0.35313	0.0				
ayr aze	ayr azb/azj	az	$\frac{0.99556}{0.71808}$	0.00086	0.45528	0.01446	0.96738 0.71546	0.00011 0.00033	0.93193 0.69627	0.0	0.48299	0.0118	0.53112	0.00768
bak	bak	-	1.0	0.0			1.0	0.0	1.0	0.0				
bam ban	bam ban	-	0.52563 0.97521	0.11122 0.00012			0.52664 0.97571	0.0991 0.0	0.53084 0.97467	0.08467 0.0				
bel bem	bel bem	be	0.9906	0.0	0.98827	0.00024	1.0 <b>0.99256</b>	0.0 0.00044	1.0 0.99256	0.0	0.98972	0.00021	0.99312	0.00013
ben	ben	bn	0.99852	0.00012	0.5005	0.02059	0.99852	0.00011	0.99852	0.0001	0.5005	0.02053	0.5005	0.02006
bho bod	bho bod	-	0.94329 <b>0.94589</b>	0.00963 0.00012			0.94374 0.94589	0.00852 0.00011	0.94846 0.94589	0.00477 0.0001				
bos	bos bug	bs	0.58206	0.00679 0.00012	0.53913	0.00518	0.57353 0.99703	0.00608	0.49605 0.99404	0.00331	0.55291	0.00431	0.00197	1e-05
bug bul	bul	bg-Latn/bg	0.99951	0.00012	0.93506	0.00141	0.99951	0.0	0.99951	0.0	0.96413	0.00073	0.98051	0.00034
cat ceb	cat ceb	ca ceb	0.99503	0.0	0.54988 0.65466	0.017 0.01081	1.0 0.99454	0.0	1.0 0.99404	0.0	0.56949 0.67137	0.01565 0.00999	0.60701 0.68434	0.01305 0.00908
ces	ces	cs	0.99951	0.00012	0.89569	0.0024	0.99951	0.00011	0.99901	0.0001	0.92435	0.00166	0.95071	0.00096
cjk ckb	cjk ckb	-	0.84493 1.0	0.00012 0.0			0.83429 1.0	0.00011	0.79834 1.0	0.0001				
cos crh	crh	co	0.98851	0.00037 0.0		0.02364	0.988	0.00033	0.988	0.00019		0.02132		0.0177
cym	cym	cy	0.99951	0.00012	0.84123	0.00396	0.99951	0.00011	1.0	0.0	0.89947	0.00232	0.93828	0.00133
dan deu	dan deu	da de	0.99357 <b>0.99901</b>	0.00074	0.93422 0.98011	0.00118	0.99554 0.99901	0.00022	0.99554 0.99852	0.00019	0.95082 0.98826	0.00079 0.00023	0.96071 0.99016	0.00046 0.00014
dik	dik	-	0.99653	0.00012			0.99653	0.0	0.99454	0.0				
dyu dzo	dyu dzo	-	0.12435 0.9496	0.03148 0.01271			0.11878 0.9491	0.0282 0.01139	0.11186 0.9491	0.02472 0.01002				
ell eng	ell eng	el-Latn/el en	1.0 0.9878	0.0	0.90811 0.95943	0.00207 0.00081	1.0 0.99215	0.0 0.00166	1.0 <b>0.99556</b>	0.0 0.00058	0.94382 0.97473	0.0012 0.00044	0.96691 0.98132	0.00066 0.00024
epo	еро	eo	0.99901	0.00025	0.91773	0.00178	0.99951	0.00011	1.0	0.0	0.95121	0.00098	0.97423	0.00043
est	est eus	et eu	0.99852 <b>0.99951</b>	0.00037 0.0	0.92477 0.86818	0.00166 0.00317	0.99951 0.99951	0.00011	0.99951 0.99951	0.0001	0.95905 0.93137	0.00084 0.00153	0.9781 0.96099	0.00038 0.00081
ewe	ewe	-	1.0	0.0			1.0	0.0	1.0	0.0				
fao fas	fao pes/prs	fa	0.99951 0.79937	0.0 0.12542	0.62121	0.02544	0.99951 0.80032	0.0 0.11171	0.99951 0.82343	0.0 0.08448	0.64803	0.02256	0.71721	0.01595
fij fil	fij	fil	0.99901	0.0		0.01989	0.99901	0.0	0.99901	0.0		0.01719		0.01419
fin	fin	fi	0.99951	0.00012	0.92449	0.00169	1.0	0.0	1.0	0.0	0.95825	0.00089	0.97817	0.00041
fon fra	fon fra	fr	0.99752 0.99951	0.0 0.00012	0.82909	0.00428	0.99752 0.99951	0.0	0.99703 0.99852	0.0 0.0001	0.85641	0.00345	0.89511	0.00233
fry fur	- fur	fy	0.99951	0.00012		0.00228	0.99951	0.00011	1.0	0.0		0.00168		0.00099
fuv	fuv	-	0.96738	0.00012			0.96099	0.0	0.94693	0.0				
gaz gla	gaz gla	- gd	0.99312 0.99951	0.0016 0.00012	0.82382	0.00446	0.90232 <u>1.0</u>	0.00055	0.78878 1.0	0.00029	0.86919	0.00312	0.91561	0.00185
gle	gle	ga	<u>1.0</u>	0.0	0.92696	0.00162	1.0	0.0	1.0	0.0	0.95234	0.00101	0.97961	0.00039
glg grn	glg grn	gl -	0.99703 1.0	0.00025 0.0	0.76147	0.0063	0.99703 1.0	0.00022 0.0	0.99703 1.0	0.0001	0.79904	0.00501	0.84291	0.0035
guj hat	guj hat	gu ht	0.99852	0.0 0.00037	0.99703 0.63645	0.0 0.01196	1.0 0.99852	0.0	1.0 <b>0.99901</b>	0.0 0.00019	0.99703 0.70798	0.0 0.00861	0.99703 0.78066	0.0 0.0057
hau	hau	ha	0.95924	0.01062	0.44685	0.02592	0.98348	0.00376	0.99313	0.00136	0.53795	0.0179	0.64867	0.01101
haw heb	heb	haw iw	1.0	0.0	0.99555	0.01547 4e-05	1.0	0.0	1.0	0.0	0.99555	0.01097 4e-05	0.99604	0.00655 3e-05
hin hmn	hin	hi-Latn/hi hmn	0.67624	0.11961	0.21078	0.07843 0.00069	0.67692	0.10685	0.69697	0.08564	0.22372	0.07248 0.00029	0.25377	0.05996 0.00014
hne	hne	-	0.90296	0.00555			0.90343	0.00487	0.898	0.0035				
hrv hun	hrv hun	hr hu	0.75157 <b>1.0</b>	0.0711 0.0	0.56313 0.71804	0.0049 0.00822	0.75573 1.0	0.06216 0.0	0.768 0.99951	0.04389	0.56847 0.79889	0.00456 0.00525	0.00394 0.88105	0.0 0.00275
hye	hye	hy	1.0	0.0	0.99703	0.0	1.0	0.0	1.0	0.0	0.99703	0.0	0.99703	0.0
ibo ilo	ibo ilo	ig -	0.99951 <b>0.99951</b>	0.00012 0.00012	0.66843	0.01036	0.99951	0.0 0.00011	1.0 0.99951	0.0 0.0001	0.75769	0.00665	0.85581	0.0034
isl ita	isl ita	is it	0.99901 0.99803	0.00025 0.00037	0.62928 0.53638	0.01231 0.01807	0.99951 0.99852	0.00011 0.00022	0.99951 <b>0.99901</b>	0.0001	0.64432 0.56196	0.01148 0.01622	0.6569 0.61908	0.01061 0.01244
jav	jav	jv	0.98442	0.00383	0.57216	0.0156	0.99166	0.00177	0.99213	0.00127	0.62126	0.01266	0.67272	0.00972
jpn kab	jpn kab	ja-Latn/ja -	0.86127	0.0 0.02605	0.67627	0.00998	1.0 0.87886	0.0 0.01858	1.0 <b>0.90909</b>	0.0 0.00954	0.76672	0.00631	0.854	0.00345
kac kam	kac	-	<u>1.0</u>	0.0			1.0 0.91183	0.0	1.0	0.0				
kam	kam kan	kn	0.91658 1.0	0.00012 0.0	0.99153	0.0	1.0	0.0	0.87368 1.0	0.0	0.99153	0.0	0.99153	0.0
kas kat	kas kat	ka	0.97649 1.0	0.0	0.99354	0.0	0.97597 1.0	0.0	0.96945 1.0	0.0	0.99354	0.0	0.99354	0.0
kaz	kaz	kk	0.99951	0.0	0.71835	0.00819	0.99951	0.0	0.99951	0.0	0.72531	0.00788	0.75968	0.00643
kbp kea	kbp kea	-	0.99901 0.95238	0.00012 0.0			0.99901 0.9513	0.00011	0.99901 0.93586	0.0001				
khm kik	khm kik	km	0.99951 0.96562	0.0 0.00876	0.99404	0.0	0.99951 0.96509	0.0 0.00774	0.99951 0.96456	0.0 0.00672	0.99404	0.0	0.99404	0.0
kin	kin	-	0.91471	0.00074			0.91471	0.00066	0.91471	0.00058				
kir kmb	kir kmb	ky	1.0 0.96321	0.0 0.00901	0.63286	0.01214	1.0 0.96923	0.0 0.00664	1.0 <b>0.97713</b>	0.0	0.63803	0.01182	0.67267	0.00987
kmr	kmr	ku (Latn)	0.99901	0.0	0.51859	0.01944	0.99901	0.0	0.99901	0.0	0.60922	0.01339	0.72318	0.00781
knc kon	knc kon	-	0.86459 0.99359	0.00272 0.00111			0.86869 0.99408	0.00055 0.00088	0.86966 0.99703	0.0001 0.00019				
kor lao	kor lao	ko lo	$\frac{1.0}{1.0}$	0.0	0.98657 0.97726	7e-05 0.0	1.0 0.99901	0.0	1.0 0.99802	0.0	0.98805 0.97726	4e-05 0.0	$\frac{0.98853}{0.97726}$	2e-05 0.0
lat	-	la	1.0	0.0	0.71120	0.00042	0.73301	0.0	0.77602	0.0	0.71120	0.00028	0.71120	0.00013

Table 30: Comparison of GlotLID vs CLD3 on FLORES-200 benchmark (part 1)

			GlotI	ID-M	CL	.D3	GlotLII	<b>)-M</b> θ <b>=.3</b>	GlotLII	<b>)-M</b> θ <b>=.</b> 5	CLD	3 θ=.5	CLD	3 θ=.7
iso639-3	FLORES Code(s)	CLD3 Code(s)	F1↑	FPR↓	F1↑	FPR↓		FPR↓	—————————————————————————————————————	FPR↓		FPR↓	—————————————————————————————————————	FPR↓
lav	lvs/ltg	lv	0.99951	0.00012	0.89202	0.00348	0.99975	0.0	0.99951	0.0	0.91429	0.00225	0.92211	0.00122
lij	lij	-	0.99901	0.00012			0.99852	0.00011	0.99753	0.0001				
lim lin	lim lin	=	0.99253 0.99901	0.0 0.00025			0.99253 0.99852	0.0	0.99153 0.99901	0.0				
lit	lit	lt	0.99951	0.0	0.78767	0.00561	0.99951	0.0	0.99951	0.0	0.84719	0.00373	0.91057	0.00196
lmo ltz	lmo	-	0.99554 0.99951	0.00025	0.02972	0.00126	0.99554	0.00022	0.99504 0.99901	0.0001	0.96011	0.00006	0.07921	0.00042
lua	ltz lua	lb	0.99653	0.00012	0.93872	0.00136	0.99553	0.0	0.99901	0.0	0.96011	0.00086	0.97821	0.00043
lug	lug	-	0.99603	0.0			0.99603	0.0	0.99454	0.0				
luo lus	luo lus	-	1.0 0.99653	0.0 0.00012			1.0 <b>0.99703</b>	0.0	0.99951 0.99653	0.0				
mag	mag	-	0.95459	0.00296			0.95507	0.00254	0.95408	0.00127				
mai mal	mai	- ml	0.97366 1.0	0.00012 0.0	0.99653	0.0	0.97366 1.0	0.00011	0.97102 1.0	0.0	0.99653	0.0	0.99653	0.0
mal mar	mal mar	mr	1.0 1.0	0.0	0.47801	0.02287	1.0	0.0	1.0	0.0	0.50855	0.02018	0.59325	0.01397
mkd	mkd	mk	<u>1.0</u>	0.0	0.99407	6e-05	1.0	0.0	1.0	0.0	0.99357	5e-05	0.99305	2e-05
mlg mlt	plt mlt	mg mt	0.99951 0.97731	0.00012 0.0058	0.89399 0.55065	0.00249 0.01708	0.99951 0.99216	0.00011 0.00177	0.99951 <b>0.99803</b>	0.0001 0.00039	0.94757 0.62752	0.00116 0.01237	0.97352 0.72662	0.00055 0.00765
mni	mni	=	0.99901	0.00012			0.99901	0.00011	0.99901	0.0001				
mon mos	khk mos	mn	0.98138	0.0	0.99508	0.0001	1.0 0.97415	0.0	0.99951 0.96418	0.0	0.99704	6e-05	0.99901	2e-05
mri	mri	mi	0.99901	0.00012	0.60242	0.01228	0.99951	0.0	0.99901	0.0	0.67426	0.00878	0.7575	0.00525
msa	min/ind/bjn/zsm	ms/id	0.97122	0.02271	0.64861	0.01076	0.97515	0.01482	0.97478	0.01051	0.64377	0.00722	0.54044	0.00419
mya nep	mya npi	my ne	0.99852	0.0 0.00025	0.67006 0.34321	0.00983 0.03993	1.0 0.99852	0.0	1.0 <b>0.99951</b>	0.0	0.67006 0.36071	0.0098 0.03687	0.67006 0.41741	0.00958 0.02834
nld	nÎd	nl	0.99803	0.00049	0.77945	0.00588	0.99901	0.00022	0.99901	0.0001	0.78535	0.00565	0.80854	0.00471
nor nso	nno/nob nso	no	0.99729 <b>0.99704</b>	0.00111 0.00062	0.95306	0.0011	0.99753 0.99704	0.00088 0.00055	0.99778 0.99655	0.00068 0.00049	0.96076	0.0007	0.95885	0.00038
nus	nus	-	0.99951	0.0			0.99951	0.0	0.99951	0.0				
nya	nya	ny	0.99753	0.00049 0.00012	0.37034	0.03552	0.99803	0.00033	0.99852	0.0001	0.41506	0.02935	0.50325	0.01996
oci ory	oci ory	-	0.99951 <b>1.0</b>	0.00012			0.80519	0.0	0.99951 0.66314	0.0				
pag	pag	-	0.99852	0.0			0.99852	0.0	0.99852	0.0				
pan pap	pan pap	pa	1.0 0.99069	0.0 0.00222	0.99553	0.0	1.0 0.99118	0.0 0.00188	1.0 <b>0.99557</b>	0.0 0.00078	0.99553	0.0	0.99553	0.0
pol	pol	pl	0.9907	0.00235	0.585	0.01483	0.99167	0.00188	0.99167	0.00165	0.61774	0.01289	0.64081	0.01137
por	por pbt	pt	0.99655	0.00086	0.77611 0.66315	0.00597 0.01051	0.99704	0.00066 0.00166	0.99704 <b>0.89142</b>	0.00049 0.00088	0.81641 0.70238	0.0046 0.00869	0.86528 0.80064	0.00305 0.00494
pus quy	quy	ps	0.88805 <b>0.75676</b>	0.00198	0.00313	0.01051	0.88853 0.625	0.0	0.57163	0.0	0.70236	0.00009	0.80004	0.00494
ron	ron	ro	0.99951	0.0	0.82339	0.00442	0.99951	0.0	0.99951	0.0	0.87289	0.00297	0.91857	0.00172
run rus	run rus	ru-Latn/ru	0.92541 <b>0.99901</b>	0.01913 0.00012	0.94255	0.00124	0.92584 0.99901	0.01703 0.00011	0.92627 0.99901	0.01489 0.0001	0.96459	0.00072	0.97521	0.00042
sag	sag	-	0.99901	0.0			0.99901	0.0	0.99901	0.0				
san sat	san sat	-	0.99104 1.0	0.00012			0.99104 1.0	0.00011	0.99103 1.0	0.0				
scn	scn	-	0.99802	0.00012			0.99802	0.00011	0.99852	0.0				
shn	shn	-	1.0	0.0	0.00254	0.0	1.0	0.0	1.0	0.0	0.00254	0.0	0.00254	0.0
sin slk	sin slk	si sk	1.0 0.99852	0.0 0.00012	0.99354 0.75414	0.0	1.0 0.99852	0.0	1.0 <b>0.99901</b>	0.0	0.99354 0.81083	0.0 0.00474	0.99354 0.87511	0.0 0.00279
slv	slv	sl	0.99508	0.00123	0.97107	0.00057	0.99655	0.00077	0.99951	0.0001	0.97955	0.00037	0.98528	0.00022
smo sna	smo sna	sm sn	0.99603 0.99951	0.0 0.00012	0.90934 0.61449	0.00198 0.01309	0.99603 0.99951	0.0	0.99603 <b>1.0</b>	0.0	0.944 0.66955	0.00114 0.01024	0.97187 0.75336	0.00048 0.00662
snd	snd	sd	0.99606	0.00099	0.47115	0.02287	0.99606	0.00088	0.99704	0.00058	0.49206	0.02092	0.57735	0.01439
som	som	so	0.97028	0.00765	0.52313 0.5043	0.01912 0.02015	0.98973 1.0	0.00232	0.99803 1.0	0.00039	0.57094 0.52382	0.01571 0.01851	0.61892 0.54545	0.01256 0.01644
sot spa	sot spa	st es	1.0 0.99508	0.00123	0.63533	0.02013	0.99508	0.00111	0.99508	0.00088	0.52582	0.01831	0.67561	0.01044
sqi	als	sq	0.99951	0.00012	0.79984	0.00523	1.0	0.0	1.0	0.0	0.88762	0.00263	0.94382	0.00117
srd srp	srd srp	sp	0.99951 0.99901	0.0 0.00025	0.99753	2e-05	0.99901 0.99951	0.0	0.99901 <b>1.0</b>	0.0	0.99802	1e-05	0.99653	1e-05
ssw	ssw		0.99455	0.00037			0.99455	0.00033	0.99455	0.00029				
sun swa	sun swh	su sw	0.9906 0.96611	0.00099 0.00876	0.45112 0.26502	0.02448 0.05802	0.99306 0.97542	0.00033 0.00564	0.99304 <b>0.98635</b>	0.0001 0.00273	0.4952 0.29567	0.02034 0.04969	0.55461 0.35717	0.01544 0.03665
swe	swe	sv	0.99803	0.00049	0.96728	0.00063	0.99951	0.00011	1.0	0.0	0.97431	0.00048	0.97991	0.00029
szl	szl tam	- ta	0.99104 1.0	0.00012 0.0	0.99303	0.0	0.99104 1.0	0.00011	0.99104 1.0	0.0001	0.99303	0.0	0.99303	0.0
tanı	taq	- ta	0.80906	0.04234	0.77303	0.0	0.83861	0.02168	0.84449	0.00876	0.77303	0.0	0.22303	0.0
tat	tat	=	1.0	0.0	0.97881	0.0	1.0	0.0	1.0	0.0	0.07001	0.0	0.97881	0.0
tel tgk	tel tgk	te tg	$\frac{1.0}{1.0}$	0.0	0.97881	0.0 0.00012	1.0 1.0	0.0	1.0 1.0	0.0	0.97881 0.99754	0.0 5e-05	0.97881	0.0 3e-05
tgl	tgl	-	0.99951	0.00012			0.99901	0.00011	0.99901	0.0001				
tha tir	tha tir	th -	$\frac{1.0}{0.98851}$	0.0	0.98749	0.0	1.0 0.98851	0.0	1.0 0.988	0.0	0.98749	0.0	0.98749	0.0
tpi	tpi	-	0.99951	0.0			0.99951	0.0	0.99901	0.0				
tsn	tsn	-	0.99753 0.99753	0.00012 0.00049			0.99753 0.99753	0.00011 0.00044	0.99753 <b>0.99901</b>	0.0001				
tso tuk	tso tuk	=	0.99755	0.00049			0.99951	0.00044	0.99951	0.0001				
tum	tum	-	0.99852	0.00025	0.54053	0.01710	0.99901	0.00011	0.99901	0.0	0.56606	0.01505	0.50005	0.0125:
tur tzm	tur tzm	tr -	0.99119 0.94421	0.00222 0.01173	0.54852	0.01718	0.99119 0.94421	0.00199 0.01051	0.99119 <b>0.94524</b>	0.00175 0.00837	0.56606	0.01595	0.59982	0.01354
uig	uig	=	1.0	0.0			1.0	0.0	1.0	0.0	0.5	_	0.5	_
ukr umb	ukr umb	uk	$\frac{0.99951}{0.88585}$	0.00012 0.00099	0.9936	0.0001	0.99951 0.8781	0.00011 0.00055	0.99951 0.834	0.0001 0.00029	0.99409	9e-05	0.99309	8e-05
urd	urd	ur	0.98346	0.00407	0.64759	0.0113	0.98346	0.00365	0.834 0.99021	0.00029	0.66866	0.01026	0.73611	0.00724
uzb	uzn	uz	0.96015	0.01037	0.63806	0.01187	0.98396	0.00365	0.99411	0.00117	0.70282	0.00882	0.77099	0.00604
vec vie	vec vie	vi	0.99703 0.99951	0.00012 0.00012	0.27281	0.0559	0.99703 <b>1.0</b>	0.00011	0.99653 1.0	0.0	0.30667	0.04728	0.37036	0.03475
war	war	-	0.99951	0.0			0.99951	0.0	0.99951	0.0		20		
wol xho	wol xho	- xh	0.99852 0.98918	0.0 0.00198	0.58763	0.0121	0.99802 0.98918	0.0 0.00177	0.99802 <b>0.99113</b>	0.0 0.00117	0.64438	0.00924	0.71054	0.00591
yid	ydd	yi yi	1.0	0.0	0.99304	1e-05	1.0	0.0	1.0	0.00117	0.99304	1e-05	0.99254	1e-05
yor	yor	yo	0.99455	0.00037	0.16841	0.00856	0.99355	0.00033	0.99053	0.0001	0.1928	0.00562	0.21661	0.00333
zho zul	yue/zho zul	zh-Latn/zh zu	0.96158	0.0 0.00185	0.88912 0.41074	0.00752 0.02908	1.0 <b>0.96353</b>	0.0 0.00122	1.0 0.96293	0.0	0.93055 0.4457	0.00435 0.02503	0.9619 0.50587	0.00208 0.01868

Table 31: Comparison of GlotLID vs CLD3 on FLORES-200 benchmark (part 2)

GlotLID-M θ=.3 GlotLID-M FT176 FT176 θ=.5 GlotLID-M  $\theta$ =.5 FT176 θ=.3 FPR↓ FLORES Code(s) FT176 Code(s) F1↑ FPR. FPR. F1↑ FPR. F1↑ FPR. F1↑ 0.0121 0.0 0.0 0.00014 0.0666 0.0 0.00082 0.0 0.00014 0.00041 0.0 0.12179 ace afr aka/twi amh 0.81658 0.00033 0.82312 6e-05 0.00012 0.05753 0.0 0.66689 0.7875 0.99553 0.01069 0.04127 0.0 0.00991 0.03454 0.0 2e-05 0.66689 0.9995 0.9324 0.04342 0.0 0.00067 0.92631 arz/ars/acm/ary/aeb/acq/apo /arb/ajp 1.0 0.99209 0.38951 0.99655 0.71808 1.0 0.52563 asm ast awa ayr b/azj bak bam ban 0.0 0.00113 0.00014 0.00099 0.00056 0.0 0.12687 0.00014 0.99553 0.47151 0.99257 0.35313 0.99951 0.69627 1.0 as ast 0.00062 0.0 0.00012 0.00025 0.0 0.10741 0.99308 0.38982 0.99951 0.71546 1.0 0.52664 0.47655 0.00012 0.74843 0.98705 0.0041 5e-05 0.002 1e-05 0.76746 0.98754 0.53084 0.97467 bar bcl be 0 1e-05 0.0 0.0 bel bem ben bho 0.0 0.00113 0.00014 0.01098 0.0 0.00054 0.00014 0.01047 0.9906 0.99852 0.94329 0.99951 0.99901 0.99951 0.99256 bn 0.01133 0.0108 0.01006 0.6647 0.99852 0.99832 0.00118 0.01109 0.00278 0.00113 0.01066 0.00022 0.00054 0.00993 5e-05 bod 0.94589 0.00014 0.94589 0.00014 0.94589 0.00012 0.66755 0.00014 0.0 0.0 0.99802 0.99951 1.0 0.99404 0.99951 1.0 bug bul cat 1e-05 0.00249 bg ca cbk ceb cs ce 0.0 0.00014 0.0 0.00014 0.99404 0.99901 0.0 0.00012 0.99503 0.99951 0.85532 0.94535 0.00014 0.0 0.84493 1.0 0.00014 0.83429 1.0  $0.00012 \\ 0.0$ ckb kw co 0.0 4e-05 1e-05 0.0 0.99803 0.00264 9e-05 0.00042 0.0 0.00014 0.00127 0.0 0.00014 0.00028 0.00025 0.0 0.0 0.00025 0.0 0.0 0.00041 0.00041 0.0 0.00014 0.00054 0.0 0.0 0.00027 crh cym dan deu dik 0.74279 0.91718 0.63409 0.00027 0.00107 0.00068 0.0 0.00049 0.00026 0.97985 0.93032 0.96935 0.00755 1.0 0.99554 0.99852 0.99752 0.97881 0.00733 0.00145 0.01279 0.9931 0.99901 0.99802 0.00026 2e-05 0.00025 0.11878 0.9491 1.0 0.03591 0.03466 0.03136 0.03466 0.014 0.0 0.00082 0.00204 0.00014 0.00014 0.0 0.0145 0.00019 0.00104 0.21432 0.01599 0.00335 0.00286 0.0 0 0.00422 6e-05 5e-05 4e-05 0.0 0.0001 0.02914 0.00085 0.00034 0.99167 <u>1.0</u> 0.00 0.00113 0.00352 0.00028 0.00042 0.0 0.0 0.00062 0.00074 0.0 0.00012 0.0 0.0 0.9878 0.99901 0.99852 **0.99951** 1.0 0.99215 0.99951 **0.99951** 0.99951 1.0 0.42352 0.96148 0.97997 0.98531 eng epo est eus ewe fao s/prs fij fin fon fra 0.09376 0.99556 0.58053 0.99951 0.99951 1.0 0.8848 1.0 0.99951 0.79937 0.99901 0.99951 0.99752 0.99951 0.99951 0.80032 0.99901 1.0 0.99752 0.99951 0.0 0.13728 0.0 0.0 0.0 0.0 0.00014 0.00041 0.99951 0.82343 0.99901 1.0 0.99703 0.99852 0.0 0.10716 0.0 0.0 0.0 0.00012 0.00025 fa 0.1430 0.85221 0.00769 0.00727 0.14306 0.0 0.00014 0.0 0.00014 0.00042 0.46242 0.02578 0.69102 0.00957 0.85981 0.00325 0.00475 0.02273 4e-05 0.00022 0.00112 0 0 fr frr fy 0.49378 0.81844 0.94619 0.99951 0.96738 0.99951 1.0 0.99703 0.00014 0.00014 0.00014 0.0 0.00028 0.99951 0.96099 <u>1.0</u> 1.0 0.00014 0.0 0.0 0.0 0.0 0.00027 fur fuv gla gle glg 0.94693 1.0 1.0 0.99703 0.00018 0.00354 0.00081 0.00018 0.00019 0.00064 0.00042 5e-05 2e-05 0.00231 0.00021 2e-05 0.71818 0.90054 0.88375 0.95846 0.85702 0.889 0.91426 gom gom als gu ht 0.0 0.00028 0.0 0.00027 0.0 0.00041 0.00462 0.00068 0.0 0.00068 0.0 0.00025 0.0 grn <u>1.0</u> 0.77784 0.60893 0.2891 0.00028 0.0 0.00042 0.01211 0.00099 0.0 0.00084 0.13644 0.00634 1.0 0.99852 0.98348 0.99901 1.0 0.00025 0.00025 0.00173 0.0 guj hat hau hrv heb 1.0 0.99852 0.95924 0.99868 0.99754 0.48932 1.0 0.05374 5e-05 0.0017 0.22877 0.00011 0.01623 0.0 2e-05 7e-05 0.0 0 0.80096 0.00092 0.77693 0.97202 1.0 0.00049 0.10864 0.00444 0.67624 0.90296 0.2581 0.06373 0.67692 **0.90343** 0.69697 0.898 0.25813 0.06152 0.26337 0.05577 hsb hu hy hun hye ibo 0.0 0.0 0.00014 0.88772 0.99754 1.0 1.0 <u>1.0</u> 0.98828 1.0 1.0 0.99951 0.99951 0.0 0.00015 0 0.00125 4e-05 0.009 0.02418 0.003 0.00022 0.00553 0.00045 0.0096 0.04818 0.00342 0.00049 0.00343 2e-05 ilo 0.99951 0.00014 0.79124 0.99951 0.00014 0.99951 0.00012 0.918140.88235 0.00014 isl ita jav 0.00028 0.00042 0.00436 0.00012 0.00012 0.0016 0.70219 0.46925 0.69871 0.00741 0.01162 3e-05 0.99901 0.99803 0.98442 0.69613 0.3149 <u>0.70892</u> 0.99951 0.99852 0.99166 0.00014 0.00027 0.00217 0.02418 0.00047 5e-05 4e-05 jv jbo ja 0.0 0.02971 0.0 0.0121 0.0 0.0 jpn kab kac kam kas kat kaz kbp kea khm kik kin kir kmb 1.0 0.87886 1.0 0.91183 0.0 0.86127 0.86607 0.0 0.02284 0.0 0.0 0.0 0.0 0.0 0.00 0.00 0.00 0.00 0.00951 0.00082 0.0 0.00014 1.0 **0.90909** 1.0 0.00014 0.0 0.00014 0.0 0.0 0.0 0.00014 0.0 0.01 0.00084 0.0 0.01028 1.0 0.91658 1.0 0.97649 1.0 0.99951 0.99901 0.95238 0.99951 0.96562 0.91471 0.87368 1.0 0.96945 1.0 0.99951 0.99901 0.93586 0.99951 0.96456 0.91471 kn 0.92632 0.00176 0.0 1.0 0.97597 1.0 0.99951 0.99901 0.9513 0.99951 0.96509 1e-05 1.0 0.99704 1.0 0.99655 km <u>1.0</u> 0.96509 0.91471 1.0 0.96923 0.99901 0.86869 0.0 0.99752 ky 0.997520.00481 0.97713 ku 0.94046 0.00129 0.98717 0.00015 2e-05 0.0031 0.00068 0.00012 0.00027 0 0.00109 0.0 0.0 kon kor lao 0.99359 0.00127 0.99408 0.00025 0.99703 0.0 0.0 2e-05 0.00034 0 0.0 1.0 0.99653 1.0 0.99802 0.99901 0.99802 0.99926 0.00014 0.87141 0.99951 0.99951 0.0 0.0 0.90388 0.00014 0.0 0.00028 0.0 0.00028 0.00014 0.0 0.00027 0.0 0.99753 0.99153 0.99901 0.99951 0.00012 0.0 0.00012 0.0 0.99852 lij lim lin lit lmo li 0.0 0.31 2e-05 0.0 0.0036 0.00133 1e-05 0.00027 0.00012

Table 32: Comparison of GlotLID vs FT176 on FLORES-200 benchmark (part 1)

GlotLID-M  $\theta$ =.3 GlotLID-M FT176 GlotLID-M  $\theta$ =.5 FT176  $\theta = 3$ FT176  $\theta = 5$ FLORES Code(s) FT176 Code(s) FPR↓ FPR↓ F1↑ F1↑ F1↑ iso639-3 F11 F1↑ FPR↓ FPR↓ F1↑ FPR↓ FPR ↓ 0.89035 ltz ltz 0.99951 0.0 0.95608 0.00011 0.99901 0.0 0.99901 0.0 0.94966 0.0 0.0 0.99653 0.99603 0.00014 0.99553 0.0 0 99404 0.0 lua lug luo lus 0.99454 0.99951 0.99653 lug luo lus 0.99603 0.99653 0.99703 0.00014 0.0 mag mai mal mar mkd 0.00313 mag 0.95459 0.00338 0.95507 0.95408 0.0016 mai mal mar 0.97366 1.0 1.0 mai 0.00014 1e-05 0.97366 0.00014 0.97102  $0.0 \\ 0.0$ 0.32838 1e-05 0.16998 0.0 0.32838 0.97683 ml 0.0 0.0 7e-05 4e-05 0.00053 0.0 0.99951 0.9907 1e-05 0.0002 0.99655 0.99654 0.9907 0.99556 0.0 mkc mk 0.0 7e-05 0.00055 1.0 0.99951 0.99654 0.51211 4e-05 mlg plt mlt mg mt 0.99951 0.97778 0.00014 0.79112 0.99951 0.00014 0.00012 2e-05 0.20885 0.0 mlt 0.00648 0.91161 0.00139 0.99216 0.00217 0.99803 0.99901 0.00049 0.90527 5e-05 0.75599 0.0 0.99901 1.0 0.98138 0.99901 0.00217 0.00014 0.0 0.0 0.0 mni 0.00014 0.99901 0.00012 0.99951 mn 0.99951 1e-05 0.0 0.99951 0.0 1.0 0.97415 mos mos 0.00014 mri mri 0.99951 0.99901 0.0 mrj msa mwl mrj 3e-05 min/ind/bin/zsm id/min/n 0.97122 0.02591 0.52247 0.05449 0.975150.01821 0.97478 0.01333 0.65691 0.01246 0.57549 0.00236 mwl 3e-05 0.01108 0.0 0.00062 0.0 0.00197 0.66689 1.0 0.0 0.00177 0.66755 0.01066 0.6702 1.0 1.0 mya mya my 0.00019 mzn mzr 6e-05 1e-05 nah nah 5e-05 nap 0.00026 1e-05 1e-05 nap nds 7e-05 0.00016 0.00937 3e-05 8e-05 0.00572 0.00016 0.99852 0.99803 0.98507 0.98671 0.60661 0.65506 0.00019 0.99852 **0.99901 0.98606** 0.00027 0.00027 0.00082 0.99951 0.99901 0.986 0.0 0.00012 0.00025 0.00028 0.00056 0.98768 0.69464  $\begin{array}{c} \underline{0.9901} \\ \underline{0.77509} \\ 0.59654 \end{array}$ nep nld nno nob nso nus npi nld ne nl nno nob nn 0.00113 0.00034 0.66016 0.00018 2e-05 no 0.98185 0.99704 0.00366 0.71096 0.00772 0.95835 0.00353 0.89931 0.00259 0.00605 0.76308 0.00435 nso 0.0007 0.99704 0.00068 0.99655 0.00062 0.99751 0.99753 0.99951 0.99951 0.0 0.00012 0.00041 0.99852 0.99951 nya oci ori orm pag pam pan nya oci ory gaz pag 0.70333 0.0017 0.0004 0.63818 0.73798 8e-05 oc 0.00014 1.0 1.0 0.0 or 1.0 0.99167 0.0 1.0 0.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 0.99803 0.99852 0.00239 0.99655 0.00095 0.00049 0.99852 0.0 0.99852 0.0 0.00031 1e-05 2e-05 0.0 0.0 pan 0.0 0.99951 1.0 0.0 0.0 pan 1.0 1.0 pa 1.0 0.99069 pap pfl pms pnb pol pap 0.00253 0.99118 0.00231 0.99557 0.00099 pfl 2e-05 0 0.00162 0.0026 0.0229 0.00042 0.00246 0.01138 0.00012 0.00145 pms pnb 0.00253 0.00268 0.00245 0.00231 0.00136 0.0021 pol 0.9907 0.49198 0.99167 0.99167 0.6529 0.66601 pl 0.01 por pus que roh ron por pbt pt ps qu rm ro 0.99655 0.00099 0.62192 0.01343 0.99704 0.88853 0.00082 0.99704 0.00062 0.81947 0.00469 0.92062 0.98295 0.00168 0.89142 0.98757 0.73444 0.88805 0.00225 0.9861 0.0001 0.00204 0.00111 6e-05 2e-05 0.00273 0.00138 0.00719 0.00016 0.0001 0.00142 0.0 1e-05 0.00018 0.99901 0.00014 0.78925 0.99951 0.38209 quy 0.0 ron 0.0 0.75522 0.99951 0.0 0.0 0.93791 0.9902 0.99951 run rus sag san 0.02182 0.02093 0.01889 run rus sag san sat 0.92541 0.92584 0.92627 ru 0.99901 0.00014 0.91501 0.00206 0.99901 0.00014 0.00012 0.99216 0.00017 0.99557 9e-05 0.99901 0.0 0.00014 0.0 0 99901 0.0 0.00014 0 0000 3e-05 0.95791  $0.0 \\ 0.00014$ sat 0.99802 0.00014 0.99802 0.00059 0.99852 0.33826 0.0 0.12419 0.0 scn scn scn 0.48256 0.0 sco 0.0007 0.00024 0.00041 0.00025 1e-05 sco shn sin slk slv shn sin slk slv 1.0 1.0 0.99852 0.99655 0.0 0.0 0.00014 1.0 1.0 0.99852 0.99508 0.0 3e-05 si sk sl 0.98753 0.94732 0.99901 0.99951 0.99603 0.9824 0.00141 0.6687 0.01048 0.00095 0.00012 0.00081 0.93215 0.00011 smo sna snd som sot smo 0.99603 0.0 0.99603 0.0 0.0 sna snd som 0.99951 0.99606 0.97028 0.00014 0.99951 0.00014 1.0 0.99704 0.99803 0.0 0.00113 0.00873 0.00119 0.00285 0.00074 0.00049 0.00021 0.00055 0.98964 0.10467 0.00013 2e-05 0.99405 0.00197 0.56777 sot 0.0 0.001360.0 0.00141 0.05073 0.99508 0.00111 0.57615 0.01575 0.72832 0.95549 0.00744 spa sqi srd ssw sun swa swe szl tam spa als es 0.99508 0.30413 0.99508 0.99308 1.0 0.99901 0.99455 0.99306 0.97542 0.00028 0.82767 0.0046 1.0 0.0 0.92795 0.00165 0.0009 0.99901 0.99951 0.99455 0.9906 0.96611 0.99803 0.0 0.0 0.00041 0.00041 0.00693 srd 0.0 0.00042 0.02822 0.00039 n gaan 0.0 2e-05 0.0 0.99455 0.99304 0.00995 0.00044 sun swh 0.00113 0.51105 0.41875 0.0 0.00012 0.65131 0.53494 sw 0.01 0.27392 0.956520.05511 0.98635 0.00346 0.0138 0.62159 0.99357 0.00248 swe szl tam 0.00056 sv 0.00101 0.99951 0.00014 0.0 0.98538 0.00031 6e-05 0.99<sub>></sub>... 0.99104 1.0 0.99104 1.0 0.80906 0.00030 0.00014 0.0 0.0483 0.00014 0.00014 0.0 0.02664 0.99104 0.00012 0.00012 0.0 0.01111 0.99557 0.0001 0.0 1.0 0.83861 0.84449 taq tat tel taq tat 0.98583 0.00028 0.98922 0.0002 0.98917 0.00015 tt  $\frac{1.0}{1.0}$ 1.0 0.0 0.0 2e-05 7e-05 0.0576 5e-05 0.99802 0.77129 tel 0.0 0.99901 1.0 0.0 1.0 0.0 0.0 1.0 0.0 0.99556 0.27747 0.99754 1e-05 0.00631 0.0 tgk tgl tha tir tpi tsn tso tuk 0.0 0.0 0.99752 0.0 tgk tgl tha tir 0.00014 0.0 0.0 0.99901 1.0 0.98851 0.00014 0.0 0.0 0.99901 1.0 0.988 0.99951 0.00012 0.94112 1.0 0.98851 0.99951 1.0 th 0.0 0.0 0.99951 0.0 0.99901 0.0 tpi tsn tso tuk 0.99753 0.99753 0.99753 0.99951 0.99852 0.00014 0.99753 0.00014 0.99753 0.00012 0.00014 0.00054 0.00014 0.00014 0.99901 0.99901 0.999119 0.00056 0.00014 0.99753 0.99951 0.00012 0.00012 0.00012 tk 3e-05 0.91416 0.0 0.92876 0.99901 0.99119 tum tur tum 0.00028 0.0 0.00222 0.99852 0.99119 0.94421 1.0 0.99951 0.88585 0.98346 tr 0.56113 0.01734 0.64768 0.01164 0.67692 0.00952 tui 0.00253 0.00245 0.00243 0.01291 0.0 0.00014 0.00068 0.00449 tzm uig ukr umb urd tzm uig ukr umb urd 0.01338 0.94421 0.94524 0.01062 n gggn1 0.0  $0.0 \\ 0.0$ ug uk  $\frac{1.0}{1.0}$ 0.00 0.00014 0.00113 0.00465 0.00012 0.00037 0.00235 0.99951 0.8781 0.99951 0.834 0.0 0.69461 0.00973 0.73985 0.00751 0.00591 ur 0.99021 0.77087 0.98346 3e-05 uzn vec 0.96015 0.01183 0.88813 0.3007 0.00144 0.98396 0.00449 0.99411 0.99653 0.00148 0.87171 0.00018 0.64847 uzb vec vep vie vls uz vec vep vi 2e-05 3e-05 0.99703 0.00014 0.0008 0.99703 0.00014 0.0 0.23345 0.07054 0.0 5e-05 0.00505 2e-05 0.0006 0.0 0.00054 0.0 0.00037 0.97074 vie 0.99951 0.81449 1.0 1.0 0.92126 0.00183 vls 0.00056 1e-05 7e-05 vol war wln wol xal xho yid yor zho war wa war 0.99951 0.0 0.56436 0.00767 0.99951 0.0 0.99951 0.0 0.7045 0.00209 0.65677 0.00029 0.00062 3e-05 wol 0.99852 0.0 0.99802 0.0 0.0 0 xal 2e-05 0 xhc 0.00225 0.98918 0.00217 0.00148 0.98918 0.99113 0.70831 0.82283 ydd 1.0 0.99455 0.0 0.0 0.0 0.0 1.0 0.0 1.0 0.0 0.00042 0.0 0.00197 0.99355 1.0 **0.96353** 0.00041 0.0 0.0015 0.00012 0.0 0.00111 0.99053 1.0 0 5491 0.00024 0.01431 0.67366 0.9762 0.99835

Table 33: Comparison of GlotLID vs FT176 on FLORES-200 benchmark (part 2)

			GlotI	ID-M	Ope	nLID	GlotLII	<b>)-M</b> θ=.3	GlotLII	<b>9-M</b> θ=.5	OpenL	ID θ=.3	OpenL	ID θ=.5
iso639-3	FLORES Code(s)	OpenLID Code(s)	F1↑	FPR↓		FPR↓	F1↑	FPR↓	F1↑	FPR↓		FPR↓	F1↑	FPR ↓
ace	ace	ace	0.95503	0.00579	0.96012	0.00734	0.955	0.00426	0.95689	0.00299	0.96012	0.00734	0.96099	0.0067
acm	acm	acm	0.01562	0.00023	0.03279	0.00051	0.00784	0.00017	0.00393	0.00011	0.03282	0.00051	0.02713	0.00038
acq aeb	acq aeb	acq aeb	0.00197 0.28501	6e-05 0.00199	0.00197 0.33982	0.0 0.00624	0.00197 0.20348	4e-05 0.00089	0.00197 0.15064	0.0 0.00026	0.00197 <b>0.34033</b>	0.0 0.00624	0.00197 0.32223	0.0 0.00444
afr	afr	afr	1.0	0.0	0.99951	0.0	1.0	0.0	1.0	0.0	0.99951	0.0	0.99951	0.0
ajp	ajp	ajp	0.10836 0.99852	0.00102	0.19064	0.00206	0.09328	0.00042	0.05369	0.00011	0.18924	0.00206	0.14808	0.00163
aka als	aka/twi als	twi als	0.99852	0.0	0.99852 0.99951	0.0 6e-05	0.99852 0.67539	0.0	0.99852 0.44785	0.0	0.99852 1.0	0.0 6e-05	0.99802 1.0	0.0
amh	amh	amh	0.99951	6e-05	0.99951	6e-05	0.99951	4e-05	0.99951	4e-05	0.99951	6e-05	0.99951	6e-05
apc arb	apc arb	apc arb	0.17857 0.25705	0.00915 0.21515	0.23324 0.24409	0.01287 0.14709	0.13223 0.12788	0.00498 0.06529	0.09179 0.09585	0.00255 0.03457	0.23229 0.24413	0.01287 0.14709	0.21749 0.24699	0.01001 0.13319
ars	ars	ars	0.00894	0.00574	0.01843	0.0179	0.00377	0.00202	0.00387	0.00074	0.01846	0.0179	0.01784	0.01314
ary	ary	ary	0.56588	0.05164	0.48937 0.42345	0.09958	0.71835 0.57422	0.00578	0.69151 <b>0.58652</b>	0.00218	0.48966	0.09958	0.50306 0.43993	0.08957
arz asm	arz asm	arz asm	0.46309 <u>1.0</u>	0.09806	0.42343 1.0	0.14168 0.0	1.0	0.03125	1.0	0.01647 0.0	0.42387 1.0	0.14168 0.0	1.0	0.12643
ast	ast	ast	0.9916	0.00051	0.99011	0.00058	0.99308	0.00025	0.99257	0.00018	0.99011	0.00058	0.99009	0.00044
awa ayr	awa ayr	awa ayr	0.38951 0.99557	6e-05 0.00045	0.67704 0.99852	0.00051 0.00019	0.38982 0.96738	0.0 4e-05	0.35313 0.93193	0.0	0.67704 0.99852	0.00051 0.00019	0.64761 <b>0.99951</b>	0.00031 6e-05
azb	azb	azb	0.36583	0.00011	0.75139	0.0	0.25065	0.0	0.13112	0.0	0.75139	0.0	0.74286	0.0
azj	azj	azj bak	0.99901 1.0	0.0	0.99901 1.0	6e-05 0.0	0.49963 1.0	0.0	0.27304 1.0	0.0	0.99901 1.0	6e-05 0.0	0.99901 1.0	6e-05 0.0
bak bam	bak bam	bam	0.52563	0.05119	0.61044	0.06424	0.52664	0.03779	0.53084	0.03213	0.61123	0.06424	0.61308	0.0614
ban	ban	ban	0.97521	6e-05	0.97887	0.00019	0.97571	0.0	0.97467	0.0	0.97937	0.00019	0.97885	0.00013
bel bem	bel bem	bel bem	0.9906	0.0 0.00045	0.97961	0.0 0.00251	1.0 <b>0.99256</b>	0.0 0.00017	1.0 0.99256	0.0 0.00015	1.0 0.98152	0.0 0.00251	1.0 0.99116	0.0 0.00094
ben	ben	ben	0.99852	6e-05	0.99253	0.0	0.99852	4e-05	0.99852	4e-05	0.99253	0.0	0.99253	0.0
bho	bho	bho	0.94329	0.00443	0.89206	0.01481	0.94374	0.00325	0.94846	0.00181	0.89206	0.01481	0.90785	0.01195
bjn bod	bjn bod	bjn bod	0.79496 <b>0.94589</b>	0.05329 6e-05	0.79638 0.80449	0.06225	0.7956 0.94589	0.03927 4e-05	0.79547 0.94589	0.03335 4e-05	0.79638 0.80449	0.06225	0.79741 0.80378	0.05965 0.0
bos	bos	bos	0.58206	0.00312	0.69239	0.01229	0.57353	0.00232	0.49605	0.00126	0.69239	0.01229	0.69172	0.01183
bug bul	bug bul	bug bul	0.99802 0.99951	6e-05 0.0	0.99654 1.0	0.00013	0.99703 0.99951	0.0	0.99404 0.99951	0.0	0.99653 1.0	0.00013	0.99703 0.99951	0.0
bul cat	bul cat	bul cat	0.99951 1.0	0.0	1.0 1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	0.99951	0.0
ceb	ceb	ceb	0.99503	0.0	0.99951	6e-05	0.99454	0.0	0.99404	0.0	0.99951	6e-05	1.0	0.0
ces cjk	ces cjk	ces cjk	0.99951 0.84493	6e-05 6e-05	0.99753 0.90232	0.00019 0.00032	0.99951 0.83429	4e-05 4e-05	0.99901 0.79834	4e-05 4e-05	0.99704 0.89554	0.00019 0.00032	0.99704 0.8716	0.00019
ckb	ckb	ckb	0.99901	0.00011	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
crh	crh	crh	0.98902	6e-05	0.99204	6e-05	0.988	0.0	0.988	0.0	0.99204	6e-05	0.99204	6e-05
cym dan	cym dan	cym dan	0.99951 0.9931	6e-05 0.00051	0.98661	0.0 0.00064	0.99951 0.99505	4e-05 0.00017	1.0 0.99554	0.0 7e-05	1.0 0.98758	0.0 0.00064	1.0 0.98757	0.0
deu	deu	deu	0.99901	0.0	<u>1.0</u>	0.0	0.99901	0.0	0.99852	0.0	1.0	0.0	1.0	0.0
dik dyu	dik dyu	dik dyu	0.99653 0.12435	6e-05 0.01449	0.99951 0.04212	0.0 0.00367	0.99653 0.11878	0.0 0.01075	0.99454 0.11186	0.0 0.00938	0.99901 0.04212	0.0 0.00367	0.99802 0.04033	0.0 0.00357
dzo	dzo	dzo	0.9496	0.00585	0.85848	0.00307	0.9491	0.00434	0.9491	0.0038	0.85848	0.00307	0.85848	0.02072
ell	ell	ell	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
eng epo	eng epo	eng epo	0.98732 0.99852	0.00148 0.00017	0.99263 0.99901	0.00084 0.00013	0.99215 0.99951	0.00063 4e-05	0.99556 1.0	0.00022	0.99308 1.0	0.00084 0.00013	0.99256 0.99951	0.00025 0.0
est	est	est	<u>1.0</u>	0.0	0.99753	0.00026	1.0	0.0	1.0	0.0	0.99901	0.00026	0.99802	0.0
eus	eus	eus	0.99951	0.0	0.99704	0.00032	0.99951	0.0	0.99951	0.0	0.99852	0.00032	0.99951	0.0
ewe fao	ewe fao	ewe fao	0.99951	0.0	0.99803 1.0	0.00026	1.0 0.99951	0.0	1.0 0.99951	0.0	0.99803 1.0	0.00026	0.99803 1.0	0.00025 0.0
fij	fij	fij	0.99951	0.0	0.99852	6e-05	0.99901	0.0	0.99901	0.0	0.99852	6e-05	0.99852	6e-05
fin fon	fin	fin fon	0.99901 0.99752	0.00011	0.99951 <b>0.99802</b>	6e-05 0.0	0.99752	0.0	1.0 0.99703	0.0	0.99802	6e-05 0.0	1.0 0.99802	0.0
fra	fon fra	fra	0.99752	6e-05	0.99503	0.0	0.99951	4e-05	0.99852	4e-05	0.99454	0.0	0.99253	0.0
fur	fur	fur	0.99951	6e-05	0.99852	0.00019	0.99951	4e-05	1.0	0.0	0.99901	0.00019	1.0	0.0
fuv gaz	fuv gaz	fuv gaz	0.96843 0.99411	6e-05 0.00068	0.98649 0.99264	6e-05 0.00097	0.96099 0.90281	0.0 0.00017	0.94693 0.78925	0.0 7e-05	0.98699 0.99508	6e-05 0.00097	0.98189 <b>0.99852</b>	0.0
gla	gla	gla	0.99951	6e-05	0.99704	0.00039	<u>1.0</u>	0.0	1.0	0.0	0.99754	0.00039	0.99901	0.00013
gle	gle	gle	0.99703	0.0	1.0 0.99704	0.0	1.0 0.99703	0.0 8e-05	1.0 0.99703	0.0 4e-05	1.0 0.99704	0.0 0.00032	1.0 0.99704	0.0
glg grn	glg grn	glg grn	1.0	0.0	0.99754	0.00032	1.0	0.0	1.0	0.0	0.99803	0.00032	0.99901	0.00031
guj	guj	guj	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
hat hau	hat hau	hat hau	0.99852 0.95427	0.00017 0.00551	0.99655 0.90196	0.00045 0.01416	0.99852 0.98348	0.00013 0.00143	0.99901 0.99313	7e-05 0.00052	0.99754 0.93143	0.00045 0.01416	0.99852 0.97495	0.00019 0.00325
heb	heb	heb	0.99606	0.00045	0.99901	0.00013	1.0	0.0	1.0	0.0	0.99901	0.00013	0.99901	0.00013
hin hne	hin	hin bne	0.67444	0.05551	0.84774	0.02279	0.6767	0.04078	0.69697	0.0325	0.8481	0.02279 0.00406	0.86814	0.01859 0.00344
hne hrv	hne hrv	hne hrv	0.90296 0.75157	0.00256 0.03272	0.93617 0.74355	0.00406 0.02427	0.90343 0.75573	0.00186 0.0237	0.898 <b>0.768</b>	0.00133 0.01666	0.93617 0.74389	0.00406	0.9314 0.74309	0.00344
hun	hun	hun	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	0.99951	0.0	1.0	0.0	0.99951	0.0
hye ibo	hye ibo	hye ibo	0.99951	0.0 6e-05	0.99951	0.0 6e-05	1.0 <b>1.0</b>	0.0	1.0 1.0	0.0	1.0 0.99951	0.0 6e-05	1.0 0.99951	0.0 6e-05
ilo	ilo	ilo	0.99951	6e-05	0.99901	0.00013	0.99951	4e-05	0.99951	4e-05	0.99901	0.00013	0.99951	6e-05
ind	ind isl	ind isl	0.91929	0.00983	0.92788	0.00566	0.92775 0.99951	0.00645 4e-05	0.93204 0.99951	0.00528	0.92788 1.0	0.00566	0.92728 1.0	0.00545
isl ita	isl ita	isl ita	0.99901 0.99803	0.00011 0.00017	1.0 0.99404	0.0	0.99951	4e-05 8e-05	0.99951 <b>0.99901</b>	4e-05 4e-05	0.99404	0.0	0.99203	0.0
jav	jav	jav	0.98346	0.00187	0.96103	0.00521	0.99166	0.00067	0.99213	0.00048	0.96978	0.00521	0.98394	0.002
jpn kab	jpn kab	jpn kab	0.85967	0.0 0.01221	0.99951 0.83636	0.0 0.02549	1.0 0.87886	0.0 0.00709	1.0 <b>0.90909</b>	0.0 0.00362	0.99951 0.8404	0.0 0.02549	0.99951 0.84887	0.0 0.02247
kac	kac	kac	<u>1.0</u>	0.01221	<u>1.0</u>	0.0	1.0	0.00709	1.0	0.00302	1.0	0.0	1.0	0.02247
kam	kam	kam	0.92406	6e-05	0.90011	6e-05	0.91416	0.0	0.87368	0.0	0.89651	6e-05	0.87382	6e-05
kan kas	kan kas	kan kas	0.97674	0.0	0.98497	0.0	1.0 0.97597	0.0	1.0 0.96945	0.0	1.0 0.98497	0.0	1.0 0.98445	0.0 6e-05
kat	kat	kat	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
kaz	kaz	kaz	0.99951 0.99901	0.0 6e-05	0.99951	0.0	0.99951 0.99901	0.0 4e-05	0.99951 0.99901	0.0 4e-05	0.99951 1.0	0.0	0.99951 1.0	0.0
kbp kea	kbp kea	kbp kea	0.95238	0.0	0.96524	0.0	0.99901	0.0	0.99901	0.0	0.96258	0.0	0.95455	0.0
khk	khk	khk	1.0	0.0	1.0	0.0	0.36246	0.0	0.21674	0.0	1.0	0.0	1.0	0.0
khm kik	khm kik	khm kik	$\frac{0.99951}{0.96562}$	0.0	0.99951 0.96282	0.0 0.00489	0.99951 0.96509	0.0 0.00295	0.99951 0.96456	0.0 0.00255	0.99951 0.96374	0.0 0.00489	0.99951 0.96512	0.0 0.00444
kin	kin	kin	0.90502	0.00403	0.96282	0.00489	0.96309	0.00293	0.90436	0.00233	0.8872	0.00489	0.88768	0.000444
kir	kir	kir	1.0	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
kmb kmr	kmb kmr	kmb kmr	0.96321 <b>0.99901</b>	0.00415 0.0	0.93939 0.99852	0.00695 0.00013	0.96923 0.99901	0.00253	0.97713 0.99901	0.00144	0.94291 0.99852	0.00695 0.00013	0.95349 0.99852	0.00426 6e-05
knc	knc	knc	0.8634	0.00153	0.86942	0.00013	0.86869	0.00021	0.86966	4e-05	0.86935	0.00013	0.86935	6e-05
kon	kon	kon	0.99802	0.0	0.99458	0.00058	0.99802 1.0	0.0	0.99802 1.0	0.0	0.99507	0.00058	0.99654 1.0	0.00013
kor	kor	kor	<u>1.0</u>	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0

Table 34: Comparison of GlotLID vs OpenLID on FLORES-200 benchmark (part 1)

			GlotI	JD-M	Ope	nLID	GlotLII	<b>)-M</b> θ=.3	GlotLII	<b>)-M</b> θ=.5	OpenL	ID θ=.3	OpenL	ID θ=.5
iso639-3	FLORES Code(s)	OpenLID Code(s)	F1↑	FPR↓		FPR↓	F1↑	FPR↓	F1↑	FPR↓		FPR↓		FPR ↓
lao	lao	lao	1.0	0.0	1.0	0.0	0.99901	0.0	0.99802	0.0	1.0	0.0	1.0	0.0
lij	lij	lij	0.99901	6e-05	0.99803	0.00019	0.99852	4e-05	0.99753	4e-05	0.99803	0.00019	0.99852	0.00013
lim lin	lim lin	lim lin	0.99253 0.99901	0.0	0.99654 <b>0.99901</b>	0.00019 0.00013	0.99253 0.99852	0.0 8e-05	0.99153 0.99901	0.0 4e-05	0.99703 0.99901	0.00019 0.00013	0.99703 0.99802	0.00013 0.00013
lit	lit	lit	0.99951	0.0	0.99852	0.00013	0.99951	0.0	0.99951	0.0	0.99852	0.00013	0.99901	6e-05
lmo ltg	lmo ltg	lmo ltg	0.99554 0.99653	0.00011	0.99753 <b>0.99852</b>	0.00026	0.99554 0.99653	8e-05 0.0	0.99504 0.99503	4e-05 0.0	0.99753 0.99852	0.00026	0.99802 0.99802	6e-05 0.0
ltz	ltz	ltz	0.99951	0.0	0.99951	0.0	0.99901	0.0	0.99901	0.0	0.99951	0.0	0.99951	0.0
lua	lua	lua	0.99653	6e-05 0.0	0.99604 0.99409	6e-05 0.00058	0.99553 0.99603	0.0	0.99404	0.0	0.99554	6e-05 0.00058	0.99553 0.99605	0.00031
lug luo	lug luo	lug luo	0.99653 1.0	0.0	0.99409	0.00038	1.0	0.0	0.99454 0.99951	0.0	0.99458 0.99951	0.00038	0.99951	6e-05
lus	lus	lus	0.99653	6e-05	0.99852	0.0	0.99703	0.0	0.99653	0.0	0.99852	0.0	0.99802	0.0
lvs mag	lvs mag	lvs mag	0.99655 0.95459	0.00034 0.00136	0.99901 0.96204	6e-05 0.00174	0.92495 0.95507	0.00021 0.00097	0.80189 0.95408	0.00015 0.00048	0.99901 0.96204	6e-05 0.00174	0.99901 <b>0.96393</b>	6e-05 0.00138
mai	mai	mai	0.97366	6e-05	0.98802	0.00013	0.97366	4e-05	0.97102	0.0	0.98802	0.00013	0.98701	0.00013
mal mar	mal mar	mal mar	$\frac{1.0}{1.0}$	0.0	0.99901	0.0	1.0 1.0	0.0	1.0 1.0	0.0	1.0 0.99901	0.0	1.0 1.0	0.0
min	min	min	0.6616	0.00017	0.66183	0.00039	0.66182	8e-05	0.66116	4e-05	0.66183	0.00039	0.66205	0.00019
mkd mlt	mkd mlt	mkd mlt	0.97401	0.0 0.00307	0.99951 0.93143	6e-05 0.00959	1.0 0.99216	0.0 0.00067	1.0 <b>0.99803</b>	0.0 0.00015	0.99951 0.95788	6e-05 0.00959	0.99951 0.98684	6e-05 0.00169
mni	mni	mni	0.99901	6e-05	0.99411	0.00077	0.99901	4e-05	0.99901	4e-05	0.99411	0.00077	0.99411	0.00075
mos	mos	mos	0.98138	0.0	0.9814 0.99951	6e-05	0.97415	0.0	0.96418	0.0	0.97881	6e-05	0.96997	0.0
mri mya	mri mya	mri mya	0.99901 <u>1.0</u>	6e-05 0.0	0.99931 1.0	6e-05 0.0	0.99951 1.0	0.0	0.99901 1.0	0.0	1.0 1.0	6e-05 0.0	1.0 1.0	0.0
nld	nld	nld	0.99803	0.00023	0.99704	0.00019	0.99901	8e-05	0.99901	4e-05	0.99704	0.00019	0.99704	0.00019
nno nob	nno nob	nno nob	0.98507 <b>0.98185</b>	0.00045 0.00148	0.98277 0.97188	0.00135 0.00193	0.98606 0.95835	0.00025	0.986 0.89931	7e-05 0.00078	0.98277 0.97086	0.00135 0.00193	0.98374 0.96883	0.00119 0.00188
npi	npi	npi	0.99104	0.00011	0.99803	0.00026	0.53362	8e-05	0.30628	0.0	0.99803	0.00026	0.99803	0.00019
nso nus	nso nus	nso nus	0.99704 0.99951	0.00028	0.9868 <b>0.99951</b>	0.00154	0.99704 0.99951	0.00021	0.99655 0.99951	0.00018	0.9868 0.99951	0.00154	0.98776 0.99951	0.00138
nya	nya	nya	0.99753	0.00023	0.99606	0.00051	0.99803	0.00013	0.99852	4e-05	0.99704	0.00051	0.99754	0.00031
oci	oci	oci	0.99951	6e-05	0.9941	0.00071	0.80510	0.0	0.99951	0.0	0.9941	0.00071	0.99557	0.0005
ory pag	ory pag	ory pag	<u>1.0</u> 0.99852	0.0 0.0	1.0 0.99901	0.0 6e-05	0.80519 0.99852	0.0	0.66314	0.0	1.0 0.99901	0.0 6e-05	1.0 0.99901	0.0 6e-05
pan	pan	pan	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
pap pbt	pap pbt	pap pbt	0.99069 0.81486	0.00102 0.00051	0.97681 0.99704	0.00303 0.00032	0.99118 0.76381	0.00072 0.00025	0.99557 0.68523	0.0003	0.9787 0.99704	0.00303 0.00032	0.9815 <b>0.99753</b>	0.00213 0.00025
pes	pes	pes	0.57435	0.08493	0.54791	0.06997	0.60647	0.04812	0.57502	0.02962	0.54829	0.06997	0.55288	0.06641
plt pol	plt pol	plt pol	0.99852 0.9907	0.0	1.0 0.99411	0.0 0.00077	0.99802 0.99167	0.0	0.99603 0.99167	0.0	1.0 <b>0.99606</b>	0.0	1.0 0.99606	0.0
por	por	por	0.99655	0.0004	0.99408	0.00051	0.99704	0.00025	0.99704	0.00018	0.99457	0.00051	0.99654	0.00019
prs quy	prs quy	prs quy	0.14688 0.75904	0.0192	0.51273 0.99951	0.01571 6e-05	0.14348 0.625	0.01135	0.1171 0.57163	0.00716	0.51273 0.99951	0.01571 6e-05	0.51395 1.0	0.01502
ron	ron	ron	0.99951	0.0	0.99754	0.00032	0.99951	0.0	0.99951	0.0	0.99852	0.00032	0.99852	0.00019
run	run	run	0.92541	0.00881	0.9044	0.01268	0.92584	0.0065	0.92627	0.00565	0.9044	0.01268	0.90563	0.01214
rus sag	rus sag	rus sag	0.99901 0.99901	6e-05 0.0	0.99901 0.99901	6e-05 0.0	0.99901 0.99901	4e-05 0.0	0.99901 0.99901	4e-05 0.0	0.99901 0.99901	6e-05 0.0	0.99901 0.99901	0.0
san	san	san	0.99104	6e-05	0.99002	0.0	0.99104	4e-05	0.99103	0.0	0.99002	0.0	0.98749	0.0
sat scn	sat scn	sat scn	0.99802	0.0 6e-05	0.99507	0.0 0.00051	1.0 0.99802	0.0 4e-05	1.0 <b>0.99852</b>	0.0	1.0 0.99556	0.0 0.00051	1.0 0.99556	0.0
shn	shn	shn	<u>1.0</u>	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
sin slk	sin slk	sin slk	1.0 0.99852	0.0 6e-05	1.0 0.99654	0.0	1.0 0.99852	0.0 4e-05	1.0 <b>0.99901</b>	0.0	1.0 0.99703	0.0 0.00019	1.0 0.99753	0.0 6e-05
slv	slv	slv	0.99459	0.00062	0.99606	0.00015	0.99655	0.0003	0.99951	4e-05	0.99753	0.00015	0.99951	0.0
smo sna	smo sna	smo sna	0.99603 0.99901	0.0	0.99852 0.99411	0.00013 0.00077	0.99603 0.99951	0.0 4e-05	0.99603 1.0	0.0	0.99901 0.99704	0.00013 0.00077	0.99951 0.99852	0.0
snd	snd	snd	0.99362	0.00074	0.99901	0.0	0.99508	0.00042	0.99704	0.00022	0.99901	0.0	0.99901	0.0
som	som	som	0.96657	0.00398	0.97683	0.00309	0.98973	0.00089	0.99803	0.00015	0.98828	0.00309	0.99557	0.00056
sot spa	sot spa	sot spa	0.99508	0.0 0.00057	0.9567 0.99211	0.0 0.00064	1.0 0.99508	0.0 0.00042	1.0 0.99508	0.0	0.9567 0.9921	0.0 0.00064	0.95401 0.99259	0.0
srd	srd	srd	0.99951	0.0	0.99606	0.00039	0.99901	0.0	0.99901	0.0	0.99704	0.00039	0.99704	0.00025
srp ssw	srp ssw	srp ssw	0.99901 <b>0.99654</b>	0.00011 0.00023	0.99951 0.99106	0.0 0.00026	0.99951 0.99456	4e-05 0.00017	0.99455	0.0	0.99951 0.99205	0.0 0.00026	0.99951 0.99254	0.0 6e-05
sun	sun	sun	0.99012	0.00057	0.99014	0.00077	0.99355	0.00013	0.99304	4e-05	0.99112	0.00077	0.99259	0.00044
swe swh	swe swh	swe swh	0.99754 0.94869	0.00028 0.00187	0.99852 0.92378	0.00019 0.01075	0.99951 0.91684	4e-05 0.00072	1.0 0.74599	0.0	0.93015	0.00019 0.01075	1.0 <b>0.95247</b>	0.0 0.00632
szl	szl	szl	0.99104	6e-05	0.99504	0.00013	0.99104	4e-05	0.99104	4e-05	0.99554	0.00013	0.99553	0.00032
tam	tam	tam	0.80642	0.0 0.02022	0.82365	0.0 0.01635	1.0 0.83861	0.0 0.00827	1.0 0.84449	0.0 0.00332	1.0 0.83486	0.0 0.01635	1.0 <b>0.85028</b>	0.0 0.00814
taq tat	taq tat	taq tat	0.80642 1.0	0.02022	<u>1.0</u>	0.01033	1.0	0.00827	1.0	0.00332	1.0	0.01033	1.0	0.00814
tel	tel	tel	1.0	0.0	0.99901	0.0	1.0	0.0	1.0	0.0	0.99901	0.0	0.99901	0.0
tgk tgl	tgk tgl	tgk tgl	0.99901	0.0	$\frac{1.0}{1.0}$	0.0	1.0 0.99901	0.0 4e-05	1.0 0.99901	0.0 4e-05	1.0 1.0	0.0	1.0 0.99951	0.0
tha	tha	tha	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
tir tpi	tir tpi	tir tpi	0.98851 0.99951	0.0	0.99951 1.0	0.0	0.98851 0.99951	0.0	0.988 0.99901	0.0	0.99951 0.99951	0.0	0.99951 0.99951	0.0
tsn	tsn	tsn	0.99753	6e-05	0.96932	0.00406	0.99753	4e-05	0.99753	4e-05	0.96932	0.00406	0.97305	0.00344
tso	tso	tso	0.99803	0.00023 0.00023	0.99606 0.99951	0.00045 6e-05	0.99753 0.99951	0.00017 4e-05	0.99901	4e-05 4e-05	0.99655	0.00045 6e-05	0.99852	0.00013
tuk tum	tuk tum	tuk tum	0.99803 0.99852	0.00023	0.99556	0.00045	0.99931	4e-05	0.99951 0.99901	0.0	0.99655	0.00045	0.99802	0.00013
tur	tur	tur	0.9907	0.00108	0.99362	0.00084	0.9907	0.0008	0.99119	0.00066	0.99362	0.00084	0.99362	0.00081
tzm uig	tzm uig	tzm uig	0.94421 0.99901	0.0054 0.00011	0.95352 1.0	0.00515	0.94421 <u>1.0</u>	0.00401	0.94524 1.0	0.00318	0.95352 1.0	0.00515	0.95302 1.0	0.00501
ukr	ukr	ukr	0.99951	6e-05	0.99951	6e-05	0.99951	4e-05	0.99951	4e-05	0.99951	6e-05	0.99951	6e-05
umb urd	umb urd	umb urd	0.88585 0.98346	0.00045 0.00187	0.97762 0.98491	0.00103 0.002	0.8781 0.98346	0.00021 0.00139	0.834 <b>0.99021</b>	0.00011 0.0007	0.97906 0.98491	0.00103 0.002	0.97433 0.98684	0.00044 0.00169
uzn	uzn	uzn	0.96885	0.00364	0.92844	0.01004	0.87839	0.00089	0.76439	0.0003	0.94934	0.01004	0.97731	0.00294
vec	vec	vec	0.99703	6e-05	0.99605	0.00026	0.99703	4e-05	0.99653	0.0	0.99605 0.99951	0.00026	0.99605	0.00025
vie war	vie war	vie war	0.99951 0.99951	6e-05 0.0	0.99951 1.0	6e-05 0.0	0.99951	0.0	1.0 0.99951	0.0	1.0	6e-05 0.0	0.99951	0.0
wol		wol	0.99852	0.0	0.99704	0.00026	0.99802	0.0	0.99802	0.0	0.99753	0.00026	0.99852	0.0
	wol			0.00097	0.98581	0.00154	0.98968	0.00067	0.99113	0.00044	0.98725	0.00154	0.98968	0.001
xho	xho	xho ydd	0.99118 0.99603	0.0	0.99901	0.0					0.99901	0.0	0.99901	0.0
xho ydd yor	xho ydd yor	ydd yor	0.99603 0.99406	0.0 0.00023	0.99901 0.99901	0.0 0.00013	0.99355	0.00013	0.99053	4e-05	0.99901 <b>0.99951</b>	0.0 0.00013	0.99951	0.0
xho ydd yor yue	xho ydd yor yue	ydd yor yue	0.99603 0.99406 0.00394	0.0 0.00023 0.0	0.99901 <b>0.00588</b>	0.00013 0.00032					0.99951 0.00588	0.00013 0.00032	0.99951 0.00588	0.0 0.00031
xho ydd yor	xho ydd yor	ydd yor	0.99603 0.99406	0.0 0.00023	0.99901	0.00013	0.99355 1.0 0.94641 0.96893	0.00013 0.0 0.00127 0.0	0.99053 1.0 <u>0.94972</u> 0.96735	4e-05 0.0 0.00081 0.0	0.99951	0.00013	0.99951	0.0

Table 35: Comparison of GlotLID vs OpenLID on FLORES-200 benchmark (part 2)

GlotLID-M NLLB GlotLID-M  $\theta$ =.3 NLLB  $\theta$ =.5 GlotLID-M  $\theta$ =.5 NLLB  $\theta$ =.3 iso639-3 FLORES Code(s) NLLB Code(s) F1↑ FPR. F1↑ FPR. F1↑ FPR. F1↑ FPR. F1↑ FPR. F1↑ FPR 1 0.95503 0.00579 0.93532 0.01209 0.00299 0.01209 0.9379 0.01076 0.95689 0.99951 0.82272 **0.99951** afr afr afr  $\frac{1.0}{0.99852}$ 0.0 0.99852 0.00011 1.0 0.0 1.0 0.0 0.99901 0.00011 0.0 0.0 0.82334 0.0058 0.99852 0.67539 0.99852 0.0 0.82334 0.0058 0.00554 0.44785 0.99901 5e-05 5e-05 0.00011 als als als 0.99852 0.0 0.0 amh amh amh 0.99951 6e-05 0.99901 0.00011 0.99951 4e-05 0.99951 4e-05 0.00011 arb 0.21515 0.31812 0.46765 0.12788 0.06529 0.09585 0.03457 0.31814 0.46765 0.31769 0.44516 0.0 asm asm asm 1.0 0.9916 0.99016 1.0 0.99257 0.00051 0.00076 0.00025 0.99065 ast ast ast 0.99308 0.00018 0.9926 0.00047 0.00076 0.00092 5e-05 0.00119 0.38951 0.99557 6e-05 0.00045 0.96113 0.99802 0.00092 5e-05 0.35313 0.93193 0.96113 0.99802 0.96304 0.99852 0.0 4e-05 0.00062 0.0 ayr ayı ayr 0.00119 0.00057 azb azb azh 0.36583 0.00011 0.8767 0.25065 0.0 0.13112 0.0 0.87956 0.88136 0.99704 0.99901 0.61944 azj bak azj bak 0.99704 0.99901 0.99704 0.99901 0.99901 0.0 0.00033 0.49963 0.0 0.27304 0.0 0.00033 0.00031 5e-05 0.05293 1.0 0.52563 5e-05 0.05293 1.0 0.52664 0.0 0.0 0.53084 0.05119 0.04998 bam bam bam 0.03779 0.03213 0.61987 0.62064 0.00233 0.00 0.00 0.00277 0.00033 0.97467 0.9712 0.00026 ban bel 0.97521 6e-05 0.0 0.9712 0.97571 1.0 0.9906 1.0 0.97394 0.00277 0.99256 0.99852 0.94374 0.00045 0.99256 0.97677 0.98922 0.00098 bem bem bem 0.00017 0.00015 ben 0.99852 0.94329 6e-05 0.00443 0.99951 0.93354 5e-05 0.00168 4e-05 0.00325 4e-05 0.00181 0.99951 0.93354 5e-05 0.00168 5e-05 0.00124 0.99852 0.94846 0.79547 0.93416 bho 0.75225 bin bjn bin 0.79496 0.05329 0.06312 0.7956 0.03927 0.03335 0.7523 0.06312 0.75747 0.05764 0.94589 0.58206 **0.99802** 6e-05 0.00312 0.96512 0.5954 0.00385 0.94589 0.57353 4e-05 0.00232 0.94589 0.49605 0.00385 0.0064 0.96569 0.5949 0.00222 0.00605 4e-05 0.00126 0.9678 0.5954 bos bos bug bul 0.97747 0.97742 bug 6e-05 0.97649 0.0006 0.99703 0.0 0.99404 0.0 0.0006 0.00036 0.0 0.9995 0.9873 0.99951 0.98828 0.99951 0.99951 0.99951 0.99951 0.00141 0.00141 0.99459 cat cat cat 0.99404 ceb ces 0.99503 0.99454 0.99951 ceh ceb 0.0 0.99951 0.0 0.0 0.0 0.99951 0.0  $0.0 \\ 0.0$ 0.99951 0.84493 0.99901 6e-05 6e-05 0.00011 4e-05 0.00011 0.99951 0.99901 4e-05 0.99951 0.83995 0.86875 0.00098 0.83429 0.79834 0.00098 4e-05 0.8611 0.00052 cjk ckb cjk ckb cjk ckb 4e-05 0.988 0.99951 0.00011 0.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 0.98902 0.99951 0.98291 0.99951 0.0 5e-05 0.0 4e-05 0.988 0.98291 0.0 5e-05 0.98138 1.0 0.99554 0.99852 0.99454 cym cym dan cym dan 0.99505 dan 0.9931 0.00051 0.99456 0.00022 0.99505 0.00017 7e-05 0.00022 0.99604 5e-05 0.00022 0.00103 0.0 0.00249 deu dik deu 0.99901 0.99653 0.9907 0.99253 0.99901 0.99653 0.0 0.0 1.0 0.99002 0.0 0.0 0.00103 0.99203 dik 0.00249 dvu dyu dvu 0.12435 0.01449 0.04797 0.11878 0.01075 0.11186 0.00938 0.04797 0.04621 0.00233 0.96791 5e-05 0.0 5e-05 0.0 dzo ell 0.9496 0.00585 0.9491 0.00434 0.9491 0.0038 0.96685 0.95405 5e-05 ell ell eng epo est eng epo 0.98732 0.00148 0.97825 0.98925 0.00244 0.00244 0.99215 0.00063 0.99556 0.00022 0.99362 0.00067 0.00017 0.99704 0.99852 0.00033 0.00016 0.99951 0.99803 0.99901 0.00033 0.00016 0.99852 0.0001  $\frac{1.0}{0.99951}$ est 5e-05 0.99951 eus ens 0.0 0.99852 0.00016 0.0 0.99951 0.0 0.99901 0.00016 0.99951 0.99704 ewe fao ewe fao ewe fao 1.0 0.99951 0.0 0.99704 0.00033 1.0 0.0 0.99704 0.00033 0.00031 0.49852 0.99951 0.50517 0.0 0.50517 0.0 0.0 0.0 0.99951 fij fii fii 0.0 0.0 0.99901 0.0 0.99901 0.0 0.0 0.99951 0.0 fin fon fin fon 0.99901 **0.99752** 0.00011 5e-05 0.0 0.9995 1.0 0.99752 1.0 0.99703 5e-05 0.0 0.99703 0.99703 0.99703 fra fra fra 0.99951 0.99951 6e-05 0.99606 0.00038 0.99951 4e-05 0.99852 4e-05 0.99852 0.00038  $\frac{0.99901}{0.99752}$ 5e-05 6e-05 6e-05 0.99802 0.98102 0.99951 0.0 0.99802 0.97842 0.0 0.00043 4e-05 1.0 0.94693 0.00043 0.96843 0.97578 0.00016 fuv fuv fuv 0.0 gaz gla 0.00068 0.99411 0.99951 5e-05 0.90281 0.00017 0.78925 7e-05 0.99951 5e-05 0.99951 5e-05 0.99951 1.0 0.99803 0.00016 0.00022 0.0 0.99901 0.99951 0.00016 0.00022 0.99901 0.99951 5e-05 5e-05 6e-05 0.0 0.0 gle glg grn glg grn 0.00011 glg grn 0.99703 0.9931 0.00054 0.99703 8e-05 0.99703 4e-05 0.99457 0.00054 0.99605 0.00021 0.0 0.99654 0.00016 1.0 0.0 0.0 0.99703 0.00016 0.99703 0.0 0.0 0.0 guj hat guj hat guj hat 1.0 0.99852 0.0 1.0 0.0 0.99852 0.99704 5e-05 0.99852 0.00017 0.99852 0.00013 0.99901 7e-05 5e-05 0.99852 0.0 0.00027 0.0 0.01594 0.00052 0.0 0.0325 0.00027 0.0 0.01594 hau 0.95427 0.00551 0.98348 0.00143 0.9931 0.99704 0.99802 0.0001 0.99606 0.00045 0.0 heb heb heb 1.0 0.6767  $0.0 \\ 0.0134$ 1.0 0.87219 0.87295 0.88558 hin hin hin 0.67444 0.05551 0.69697  $\begin{array}{c} 0.87293 \\ 0.92997 \\ \underline{0.73382} \\ 0.99557 \end{array}$ 0.92713 0.73361 0.90296 0.75157 0.00256 0.03272 0.00146 0.02901 0.00186 0.0237 0.898 **0.768** 0.00133 0.01666 0.00146 0.02901 0.92997 0.73352 0.90343 0.75573 1.0 1.0 0.99951 0.99951 hun hun hun 0.0 0.99264 0.00081 1.0 0.0 0.0 0.00081 0.0 1.0 hye ibo 0.0 1.0 0.99951 5e-05 0.00016 5e-05 0.00016 0.99951 6e-05 ibo 1.0 0.0 0.0 0.99852 0.99951 0.99951 ilo ilo ilo 0.99951 6e-05 0.99852 4e-05 4e-05 0.99951 5e-05 ind isl 0.91929 0.99901 0.00983 0.00011 0.81942 0.76205 0.02294 0.03427 0.92775 **0.99951** 0.00645 4e-05 0.93204 0.99951 0.00528 0.82348 0.76205 0.02294 0.03427 0.8455 0.76522 0.018 0.03213 4e-05 ita ita 0.99803 0.00017 0.97212 0.00309 0.99852 8e-05 0.9990 4e-05 0.97634 0.00309 0.98346 0.00171 0.97212 0.97674 0.98268 0.85787 0.00239 0.00087 0.97769 0.97702 0.00239 0.00087 0.98244 0.96175 0.00171 0.98346 0.00187 0.99166 0.00067 0.9921 0.00048 0.0 jpn kab jpn kab jpn kab 1.0 0.85967 0.01221 0.87886 0.00709 0.00362 0.01811 0.90909 0.8586 0.01811 0.86043 0.01692 0.00011 1.0 0.91416 0.00011  $\frac{1.0}{0.92406}$ <u>1.0</u> 0.75811 1.0 0.70415 1.0 0.87368 6e-05 0.74892 kam kam 1.0 0.97674 1.0 0.99951 kan kan kan 0.0 0.0 1.0 0.0 0.0 1.0 0.0 0.97545 1.0 0.99951 0.97753 5e-05 0.0 0.97597 1.0 0.96945 1.0 0.97752 5e-05 0.0 1.0 0.99951 0.99951 0.99951 0.99951 kaz kaz kaz 0.0 0.0 0.0 0.0 0.0 0.0 0.99901 0.95238 6e-05 0.0 1.0 0.96099 0.0 0.99901 4e-05 0.0 0.99901 0.93586 4e-05 0.0 0.99951 0.0 0.99901 0.95831 0.94693 kea khk kea khk 0.0 khk 0.0 1.0 0.0 0.36246 0.0 0.21674 0.0 1.0 0.0 0.0 0.99951 0.96562 0.99901 0.96357 0.99951 0.96509 0.99951 0.96456 0.0 0.00255 0.99901 0.96257 0.0 0.00374 0.99901 0.96158 0.0 0.0 0.00374 0.0 0.00295 0.00403 kik kin kin 0.91471 0.00034 0.97881 0.0013 0.91471 0.00025 0.91471 0.00022 0.97879 0.0013 0.97879 0.00119 kir 0.0 1.0 0.93613 0.0 0.00415 0.00564 0.96923 0.97713 0.99901 0.94106 0.00564 kmb 0.00253 0.00144 kmb kmb kmr kmr kmr 0.99901 0.0 0.99508 0.00054 0.99901 0.0 0.0 0.99655 0.00054 0.99704 0.00026 0.8634 **0.99802** 0.00153 0.86855 0.9936 0.00054 0.00054 0.86869 0.99802 0.00021 4e-05 0.0 0.86784 0.99507 0.00054 0.00054 0.86966 0.99802 5e-05 0.00021 kon kon kon 0.99605 1.0 1.0 0.99901 koı 0.0 0.99606 0.00043 1.0 0.0 1.0 0.0 0.99951 0.00043 0.0 0.99852 lao lij lao lij 0.0 6e-05 0.99951 0.97738 0.00027 0.99901 0.0 4e-05 0.99802 0.0 4e-05 0.99901 0.97735 0.0 0.99852 0.99253 0.99901 0.99951 lim lim 0.0 0.98701 0.00011 0.99253 0.0 0.99153 0.0 0.98701 0.00011 0.98701 0.0001 0.99556 0.00033 8e-05 0.0 4e-05 0.0 0.99605 **0.99951** 0.00033 0.99654 0.00016 0.00011 0.99852 0.9990 0.99951

Table 36: Comparison of GlotLID vs NLLB on FLORES-200 benchmark (part 1)

GlotLID-M NLLB GlotLID-M  $\theta$ =.3 NLLB θ=.5 GlotLID-M  $\theta$ =.5 NLLB  $\theta$ =.3 iso639-3 FLORES Code(s) NLLB Code(s) F1↑ FPR. F1↑ FPR. F1↑ FPR. F1↑ FPR. F1↑ FPR. F1↑ FPR 1 0.99554 0.00011 0.96961 0.00119 4e-05 0.00119 0.00067 lmo 0.97003 ltg ltz ltg ltz 0.99653 0.0 0.99203 0.0 0.99653 0.0 0.99503 0.0 0.99203 0.0 0.99153 0.0 ltg ltz 0.99951 0.99653 0.0 0.99951 0.99358 0.0 0.99901 0.99553 0.99901 0.99404 0.0 0.99951 0.99357 0.0 0.99951 0.99554 0.00038 6e-05 0.00038 lua lua lua 0.0 lug luo lug luo 0.99653 0.0 0.99214 0.00076 0.99603 0.0 0.99454 0.0 0.99311 0.00076 0.99458 0.00041 lug luo 0.99753 0.99454 0.99362 5e-05 5e-05 5e-05 5e-05 0.0 0.0 0.99951 0.0 0.99753 0.99703 0.0 0.99703 0.92495 0.99653 0.99404 0.99303 6e-05 0.00034 0.0 lus lus lus 0.0 lvs lvs lvs 0.99655 0.0007 0.00021 0.80189 0.00015 0.99362 0.0007 0.99411 0.00062 0.95459 0.97366 0.00136 6e-05 0.9311 **0.98709** 0.00233 0.00043 0.95507 0.97366 0.00097 4e-05 0.00233 mag mai 0.95408 0.00048 0.9311 0.93218 0.98706 0.00181 0.97102 0.98709 0.00031 mai mai mal mar 1.0 1.0 0.6616 mal mal 0.0 1.0 0.99508 0.0 1.0 0.0 0.0 0.0 0.99901 0.26341 0.0 0.00054 0.0 0.0 0.99655 0.00054 0.0001 0.00017 0.29545 0.66182 1.0 5e-05 8e-05 0.66116 4e-05 0.29558 5e-05 min min 0.97401 0.99901 mkd mkd mkd 0.0 1.0 0.99901 0.0 0.0 1.0 0.0 0.0 1.0 0.0 0.00307 6e-05 0.00011 0.99216 0.99901 0.00067 4e-05 0.99803 0.99901 0.00015 4e-05 0.99951 0.99951 0.00011 0.99951 0.99951 mlt mni 0.99951 mni mni 0.98138 0.99901 mos mos mos 0.0 0.9684 0.0 0.97415 0.0 0.96418 0.0 0.96629 0.0 0.95992 0.0 0.99852 5e-05 0.0 mri 6e-05 0.99852 5e-05 0.99951 0.99901 0.0 0.99852 0.0 mya nld mya nld 0.99803 1.0 0.983 1.0 **0.99901** 0.0 0.0 mya 0.00023 0.98587 0.0019 0.99901 0.0019 0.98828 nld 8e-05 4e-05 0.00124 0.98507 0.98185 0.00045 0.00148 0.9697 0.98289 0.00228 0.00152 0.00025 0.0011 0.986 0.89931 7e-05 0.00078 0.9697 0.98385 0.00228 0.00152 0.00155 0.00124 nno nob 0.98606 0.95835 0.97491 **0.98481** nob nob npi nso npi nso npi nso 0.99803 0.99803 0.99104 0.00011 0.00022 0.53362 8e-05 0.30628 0.0 0.00022 0.99852 0.00016 0.99704 0.99751 0.99753 0.98386 0.99803 0.00146 0.00016 0.99655 0.99951 0.98386 0.99803 0.00146 0.00016 0.00028 0 99704 0.00021 0.00018 0.00119 nus nus nus 0.00023 0.00013 0.94604 0.00179 0.99803 0.99852 0.99951 4e-05 0.94636 0.00179 0.95175 0.00047 0.00179 0.00179 0.0 0.00011 0.99951 6e-05 0.98346 0.00179 0.80519 0.0 0.98634 0.99118 0.00088 0.0 0.66314 ory ory ory  $\frac{1.0}{0.99852}$ 1.0 0.99703 0.000111.0 0.99753 0.99653 pag pan 0.0 0.99852 0.0 0.99852 0.0 0.0 1.0 0.99069 0.0 0.00102 1.0 0.98394 0.0 0.00174 0.0 0.0 0.00174 0.99118 0.99557 0.68523 0.98538 0.98681 0.99555 pap pap pap **0.99654** 0.68739 pbt  $\frac{0.81486}{0.57435}$ 0.00051 0.00016 0.76381 0.00025 0.00011 0.99654 0.00016 0.00016 0.02962 0.0 0.00063 0.04815 0.0 0.00179 0.08493 0.60647 0.57502 0.99603 0.04553 0.04815 0.04812 0.68763 pes plt 0.6893 0.99852 plt 0.00072plt 1.0 0.98396 0.00108 0.00179 0.9878 0.98925 0.00114 pol por pol 0.9907 0.99167 0.99167 0.99655 0.14688 0.00157 0.00098 0.99704 0.98924 0.49305 0.00157 0.00098 0.0004 0.0192 0.98538  $\begin{array}{c} 0.00025 \\ 0.01135 \end{array}$  $\begin{array}{c} 0.00018 \\ 0.00716 \end{array}$ 0.99312 0.49305 0.00067 0.00093 0.49305 prs prs prs  $\begin{array}{c} 0.57163 \\ 0.99951 \\ \underline{0.92627} \\ 0.99901 \end{array}$ 0.99852 0.97824 0.0 0.0 0.625 0.0 0.0 0.0 0.0 **0.99951** 0.92541 0.99951 0.92584 0.00016 0.00114 0.0 0.00016 0.0 0.99852 0.99852 0.00016 0.00010 0.97824 0.97919 0.99901 0.00881 0.0065 0.00565 run run run rus sag rus sag rus 0.99901 6e-05 0.99901 0.00011 0.99901 4e-05 4e-05 0.99901 0.00011 0.0001 0.99901 0.0 5e-05 0.99901 0.0 0.9990 0.0 0.9975 5e-05 0.00011 0.99703 0.99103 0.99104 6e-05 0.98853 0.00011 0.99104 4e-05 0.98495 san san san 0.98902 sat sat sat 0.0 0.0 1.0 0.0 0.0 0.0 0.0 6e-05 0.0 0.99361 0.99852 0.0006 0.99458 0.99802 0.0006 0.99802 0.99802 4e-05 0.0 0.99852 0.99458 1.0 1.0 0.99852 0.99503 sin sin sin 0.0 1.0 0.99951 0.0 1.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 6e-05 0.00062 5e-05 0.00016 4e-05 0.0003 0.0 4e-05 5e-05 0.00016 slk slv slk 0.99852 0.99901 0.99459 0.99852 0.99655 0.99951 slv slv 1.0 0.99951 smo smo smo 0.99603 0.0 0.99852 0.00011 0.99603 0.0 0.99603 0.0 0.99951 0.00011 0.0 0.99901 0.99362 0.00011 0.00074 0.99411 0.99704 0.00065 0.00033 0.99951 0.99508 4e-05 0.00042 0.0 0.00022 0.99508 0.99704 0.00065 0.99655 0.99852 sna snd 1.0 0.99704 0.00031 0.00016 snd snd som sot som 0.96657 0.00398 1.0 0.75523 0.0 0.98973 0.00089 0.99803 0.00015 0.0 0.0 0.0 0.75523 0.0 0.75062 0.99215 0.00057 0.99508 0.00042 0.99508 0.00033 0.00081 0.99361 0.00081 **0.99655** 0.96735 0.00031 spa srd spa srd spa srd 0.99901 0.99901 0.99012 0.0 0.97726 0.0 0.99901 0.0 0.9990 0.0 0.97519 0.0 0.0 0.00011 1.0 0.99155 0.0 0.99951 4e-05 0.0 0.0 0.99155 0.96129 0.00023 0.00016 0.00017 0.00011 0.00016 0.99204 ssw sun sun sun 0.00057 0.95988 0.00277 0.99355 0.00013 0.99304 4e-05 0.00277 0.96781 0.00155 0.99754 **0.94869** 0.00037 0.00028 0.00187 0.99901 0.88153 5e-05 0.01475 0.99951 0.88811 5e-05 0.01475 0.99951 0.91328 swe swe 1.0 0.74599 szl szl szl 0.99104 6e-05 0.98753 0.00016 0.99104 4e-05 0.99104 4e-05 0.98852 0.00016 0.98901 0.0 0.80642 0.0 1.0 0.82223 0.0 0.0 1.0 0.81776 0.82189 0.02022 0.83861 0.00827 0.00332 0.84449 tag taq tag 0.0 1.0 1.0 1.0 tat 0.0 0.99951 0.0 1.0 0.0 0.0 0.99951 0.0 0.99951 0.0 0.0 0.0 0.0 0.0 1.0 1.0 tgk tgk tgk tgl tha tgl tha 0.99901 0.00011 0.99704 0.00027 0.99901 4e-05 0.99901 4e-05 0.99803 0.00027 0.99852 0.0001 0.0 1.0 0.99951 1.0 0.988 0.0 1.0 0.99951 1.0 0.98851 0.0 1.0 0.0 0.0 tir 0.98851 0.99951 0.0 0.0 tir 0.0 tpi tsn tpi tsn tpi tsn 0.99951 0.0 0.9980 0.0 0.99951 0.0 0.99901 0.0 0.99802 0.0 0.99752 0.0 0.99753 0.99803 0.99803 0.99753 0.99901 0.99951 6e-05 0.00023 0.84237 0.99069 0.02039 0.00098 0.99753 0.99753 4e-05 4e-05 0.02039 0.00098 4e-05 0.00017 0.84259 0.84577 0.01888 0.00031 0.99214 0.99606 tso tso 1.0 0.98155 0.98348 tuk tuk tuk 0.00023 0.0 0.99951 4e-05 4e-05 0.0 0.0 0.99852 0.9907 0.00011 0.00108 0.00201 0.00184 **0.99901** 0.9907 4e-05 0.0008 0.99901 **0.99119** 0.0 0.98251 0.98491 0.00201 0.98972 0.98539 0.00103 0.00155 tum tur 0.99951 0.94421 0.99901 twi twi twi 0.0 0.8426 0.01231 0.99752 0.0 0.99503 0.0  $\frac{0.84299}{0.8849}$ 0.01231 0.84284 0.01164 0.0054 0.88539 0.99951 0.01421 0.94421 0.00401 0.94524 0.00318 0.01421 0.8849 0.01356 0.00011 0.99951 5e-05 0.99951 5e-05 uig uig uig 5e-05 0.99951 0.99951 4e-05 4e-05 ukı uki uki 0.99951 6e-05 1.0 0.0 1.0 0.0 0.0 0.00045 0.00187 0.96869 0.97354 0.00228 0.00298 0.8781 0.98346 0.00021 0.00139 0.834 **0.99021** 0.00011 0.0007 0.97247 0.97401 0.00228 0.00298 0.97617 0.97495 0.88585 0.98346 0.00098 umb 0.00269 urd urd urd uzn uzn 0.96885 0.00364 0.99852 0.00016 0.87839 0.00089 0.76439 0.0003 0.99852 0.00016 0.99951 0.99206 5e-05 **0.99703** 0.99951 0.00018 0.99208 0.99951 6e-05 0.99159 0.99703 4e-05 0.99653 0.00038 0.00016 0.98925 0.00119 6e-05 0.0 vie vie vie 0.0 1.0 0.99951 0.0 1.0 0.99951 0.99951 0.0 0.99901 0.00011 0.0 0.0 0.99951 0.000110.0 0.0 0.00097 0.99504 0.97793 0.00011 0.00013 0.99802 0.98968 0.99802 0.99113 0.99554 0.97937 0.00011 0.00163 wol xho wol xho 0.99852 0.99118 0.0 0.99554 5e-05 0.00072 0.00067 0.98566 vdd vdd ydd 0.99603 0.0 0.0 0.0 1.0 0.0 0.99556 yor 0.99406 0.00394 0.00023 0.00033 0.03395 0.99355 0.00013 0.99053 4e-05 0.99654 0.47231 0.00033 0.03395 0.99752 0.46292 0.4777 yue 0.69715 0.93459 0.96955 0.0 zho zho 1.0 0.93506 0.0 0.02543 1.0 0.0 1.0 0.65912 0.02543 0.617 0.01821 0.00342 0.00293 0.94641 0.96893 0.00127 0.94972 0.96735 0.93924 0.00307 0.00081 0.00342 0.94869 0.00171

with confidence threshold  $\boldsymbol{\theta}$ 

Table 37: Comparison of GlotLID vs NLLB on FLORES-200 benchmark (part 2)

0.0

0.96893

0.97379

0.00293

0.97901

									wi	ce threshol	threshold $\theta$			
			GlotL	ID-M	CL	.D3	GlotLII	9-M θ=.3 GlotLID		<b>)-M</b> θ=.5	CLD:	3 θ= <b>.</b> 5	CLD:	3 θ=.7
iso639-3	UDHR Code(s)	CLD3 Code(s)	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
aar	aar	-												
abk ace	abk ace	-	0.91603	0.00125			0.91603	0.00122	0.91603	0.00118				
acu	acu	-	0.58635	0.0			0.58635	0.0	0.58065	0.0				
ada ady	ada ady	-	0.91045 <b>0.83495</b>	0.0015			0.9313 0.83495	0.0011	0.93846 0.83495	0.00094				
afr	afr	af	0.95238 0.81429	0.00075 0.00037	0.85106	0.00096	0.96774	0.00049 0.00024	0.97561 0.82014	0.00035 0.00024	0.89552	0.00064	0.93023	0.00041
agr aii	agr aii	-	0.81429	0.00037			0.82014	0.00024	0.82014	0.00024				
ajg alt	ajg alt	-	0.64516 0.95495	0.00822 0.00037			0.65217 <b>0.96364</b>	0.0078 0.00024	0.65574 0.96364	0.00743 0.00024				
amc	amc	-												
ame amh	ame amh	- am	$\frac{1.0}{1.0}$	0.0	0.7	0.00274	1.0 1.0	0.0	1.0 1.0	0.0	0.7	0.00273	0.7	0.00272
ami	ami	-	0.20896	0.0			0.125	0.0	0.09524	0.0				
amr ara	amr arb	ar	0.89552	0.0 0.00174	0.83333	0.00109	0.99187 0.93023	0.0 0.0011	0.99187 <b>0.98361</b>	0.0 0.00024	0.85106	0.00096	0.92308	0.00045
arl arn	arl arn	-	0.99187 0.93913	0.0 0.00012			0.99187 <b>0.94737</b>	0.0	0.99187 0.94737	0.0				
ast	ast	-	0.97521	0.00012			0.97521	0.00012	0.98333	0.0				
auc avr	auc avr	-	0.01504 0.99174	0.0 0.00012			0.91071	0.00012	0.84615	0.0				
aze	azj/azb	az	0.6413	0.0081	0.21034	0.01446	0.6413	0.00792	0.64658	0.00731	0.22736	0.01253	0.25708	0.00973
bam ban	bam ban	-	0.49682 <b>0.98361</b>	0.00723			0.5098 0.98361	0.00658	0.55319 0.97521	0.00495 0.0				
bax	bax	-	0.92187	0.00112			0.92913	0.00098	0.93548	0.00071				
bba bci	bba bci	-	0.92187	0.00112			0.92913	0.00098	<u>0.93548</u> <u>1.0</u>	0.00071				
bcl bel	bcl bel	be	0.98333	0.0	0.50633	0.00529	1.0 0.98333	0.0	0.9916 0.98333	0.0	0.53571	0.00469	0.61856	0.0033
bem	bem	=	0.98333	0.00025			0.98333	0.00024	0.98333	0.00024				
ben bfa	ben bfa	bn -	1.0	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
bho	bho	-	0.78519	0.00037			0.78519	0.00037	0.77273	0.00024				
bin bis	bin bis	-	0.9927 <u>1.0</u>	0.00012 0.0			1.0 1.0	0.0	1.0 1.0	0.0				
blt boa	blt boa	-	0.99213	0.00012			0.99213	0.00012	1.0	0.0				
bod	bod	-	0.89091	0.00012			0.89091	0.00012	0.89091	0.00012				
bos bre	bos bre	bs	0.18103 <b>0.98361</b>	0.01134	0.23913	0.00561	0.18605 0.98361	0.00914	0.14607 0.98361	0.00531	0.27386	0.00401	0.0	5e-05
buc	buc	-												
bug bul	bug bul	bg/bg-Latn	0.95312 0.96	0.00062 0.00062	0.52212	0.00488	0.96063 0.96	0.00049 0.00061	0.976 0.97561	0.00024 0.00035	0.59	0.00369	0.67052	0.00249
bum cab	bum cab	-	0.54762 1.0	0.00025 0.0			0.53659 1.0	0.00012 0.0	0.46154	0.00012				
cak	cak	-	1.0	0.0			1.0	0.0	1.0	0.0				
cat cbi	cat cbi	ca -	0.9375 0.9771	0.001 0.00025	0.24691	0.0167	0.95238 <b>0.99225</b>	0.00073 0.0	0.96774 0.99225	0.00047	0.27397	0.01449	0.3352	0.01077
cbr	cbr	-	0.7033	0.0			0.65909	0.0	0.54321	0.0				
cbs cbt	cbs cbt	-	0.67308 0.97479	0.00037 0.00012			0.66 0.97479	0.00012 0.00012	0.61053 <b>0.98305</b>	0.0				
cbu	cbu	-	0.18462	0.0			0.09677	0.0	0.03333	0.0				
ceb	cep ceb	ceb	0.96721	0.0005	0.43182	0.00675	0.9916	0.00012	<u>1.0</u>	0.0	0.456	0.00611	0.48718	0.00534
ces cfm	ces cfm	cs	$\frac{0.98387}{0.85714}$	0.0	0.6776	0.00265	0.98387 0.85714	0.0	0.98387 0.84615	0.0	0.74699	0.00187	0.79487	0.0014
cha	cha	-	0.8381	0.00012			0.82353	0.0	0.8	0.0				
chj chk	chj chk	-	0.12727 0.97521	0.00536 0.00012			0.14286 <b>0.98333</b>	0.00378	0.15385 0.97479	0.00141				
chr chv	chr chv	-	$\frac{0.03333}{0.86154}$	0.0			0.86154	0.0	0.86154	0.0				
cic	cic	-		0.0				0.0		0.0				
cjk cjs	cjk cjs	-	0.92641 0.65217	0.00037 0.0			0.92641 0.65217	0.00037 0.0	0.92035 0.63736	0.00012				
ckb	ckb	-												
cnh cni	cnh cni	-	0.93023 0.90226	0.00112 0.00162			0.9375 0.90909	0.00098 0.00146	0.94488 0.91603	0.00083 0.0013				
cnr cof	cnr	-	0.74747	0.0			0.63736	0.0	0.54118	0.0				
cos	cos	co	0.95082	0.0005	0.30227	0.01264	0.98305	0.0	0.98305	0.0	0.33241	0.01098	0.41812	0.00756
cot cpu	cot cpu	-	0.96774 <b>0.89908</b>	0.00025			0.96774 0.89908	0.00024	0.97561 0.89908	0.00012 0.0				
crh	crh	-	0.98361	0.00025			0.98361	0.00024	0.98361	0.00024				
cri crs	cri crs	-	0.84404 <u>1.0</u>	0.00037 0.0			0.85185 1.0	0.00024 0.0	0.80769 1.0	0.00024 0.0				
csa csw	csa	-	0.0	0.00199			0.0	0.00049						
ctd	csw ctd	-	0.78431	0.0			0.78431	0.0	0.74747	0.0				
cym dag	cym dag	cy	<u>1.0</u>	0.0	0.46792	0.00643	1.0	0.0	1.0	0.0	0.55111	0.0046	0.63918	0.00317
dan	dan	da	0.85714	0.00262	0.91473	0.00032	0.91304	0.00146	0.98437	0.00024	0.93651	0.00018	0.95161	9e-05
ddn deu	ddn deu	de	0.98745	0.00012	0.92549	0.00078	0.98745	0.00012	0.98745	0.00012	0.944	0.00055	0.95547	0.00041
dga	dga	=	0.71166	0.00548			0.73885	0.00463	0.8	0.00307				
dip div	dip div	-	0.96774	0.0			0.96774	0.0	0.93333	0.0				
duu dyo	duu dyo	-	0.97391	0.0			0.97391	0.0	0.96491	0.0				
dyu	dyu	-	0.23188	0.00785			0.22059	0.00756	0.17323	0.00672				
dzo ell	dzo ell	el/el-Latn	0.90769 0.97908	0.00137 0.0	0.81879	0.00246	0.90769 0.97908	0.00134 0.0	0.90769 0.97908	0.0013	0.91045	0.00109	0.95686	0.0005
emk	emk	-	0.85294	0.00224	0.40956	0.00789	0.87218	0.00183		0.00153	0.40972		0.42143	0.00729
eng epo	eng epo	en eo	0.96825	0.0005	0.35882	0.00789	0.976	0.00037	0.8855 0.976	0.00035	0.39228	0.0077 0.00861	0.42143	0.00729
ese est	ese ekk	- et	0.75 0.59701	0.00012 0.01009	0.40816	0.00794	0.75789 0.63492	0.0 0.00841	0.73118 <b>0.7362</b>	0.0 0.00507	0.46332	0.00633	0.59406	0.00371
eus	eus	eu	0.9313	0.00112	0.36747	0.00958	0.96825	0.00049	0.98387	0.00024	0.488	0.00583	0.60396	0.00362

Table 38: Comparison of GlotLID vs CLD3 on UDHR benchmark (part 1)

									wi	th confiden	ce threshol	$\mathbf{d} \; \theta$		
			GlotI	ID-M	CI	.D3	GlotLII	<b>)-M</b> θ=.3	GlotLII	<b>)-M</b> θ=.5	CLD	3 θ= <b>.</b> 5	CLD:	3 θ=.7
iso639-3	UDHR Code(s)	CLD3 Code(s)	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
eve evn ewe fao	eve evn ewe fao	- - -	0.27586 0.21154 0.98361 0.98305	0.00361 0.00424 0.00025 0.0			0.27451 0.2029 0.98361 0.98305	0.00207 0.00037 0.00024 0.0	0.22222 0.03333 0.98361 0.98305	0.00012 0.0 0.00024 0.0				
fas fat fij fil	pes/prs fat fij	fa - - fil	0.90152 0.97521 1.0	0.00311 0.00025 0.0	0.86331	0.00173	0.90494 0.97521 1.0	0.00293 0.00024 0.0	0.90494 0.97521 1.0	0.00283 0.00024 0.0	0.89888	0.00123	0.94118	0.00068
fin fkv fon	fin fkv fon	fi - -	0.38066 <u>0.28571</u> 0.94118	0.02554 0.0 0.0005	0.27391	0.01524	0.39252 0.28571 0.94915	0.02377 0.0 0.00037	0.41311 0.23529 0.95726	0.0211 0.0 0.00024	0.3	0.0134	0.33871	0.01113
fra fry fuf fur	fra fry fuf fur	fr fy -	0.95238 0.99174 <b>0.04762</b> 0.91473	0.00075 0.00012 0.0005 0.00125	0.37855 0.67039	0.00899 0.00269	0.95935 1.0 0.01613 0.95935	0.00049 0.0 0.00049 0.00049	0.9661 1.0 0.0 0.96721	0.00012 0.0 0.00035 0.00035	0.41379 0.74074	0.00775 0.00191	0.48583 0.83333	0.00575 0.00109
fuv fvr gaa gag	fuv fvr gaa gag	- - -	0.77912 0.93846 <b>0.93103</b>	0.00237 0.001 0.0			0.80833 0.96825 0.93103	0.00122 0.00049 0.0	0.81197 0.98387 0.93103	0.00071 0.00024 0.0				
gaz gjn gkp gla	gaz gjn gkp gla	- - - gd	0.83221 0.90476 0.92063 0.94574	0.00311 0.001 0.00125 0.00025	0.50769	0.00584	0.88235 0.93443 0.93548 0.95312	0.00171 0.00049 0.00098 0.00012	0.83761 0.95798 0.96667 0.96063	0.00071 0.00012 0.00047 0.0	0.6055	0.00392	0.71351	0.0024
gld gle	gld gle	- ga	0.95	0.001	0.55882	0.00324	0.96815	0.00061	0.96815	0.00059	0.63333	0.00214	0.74026	0.00095
glg glv gsw	glg glv gsw	gl - -	0.98305 1.0 0.98333 0.96063	0.00012 0.0 0.00012 0.00062	0.57711	0.00383	0.98305 1.0 <b>0.9916</b> 0.96825	0.00012 0.0 0.0 0.00049	0.98305 1.0 0.9916 <b>0.98387</b>	0.00012 0.0 0.0 0.00024	0.64804	0.00283	0.73885	0.00181
guc gug guj guk	guc gug guj guk	gu -	0.80992 1.0	0.0 0.0 0.0	<u>1.0</u>	0.0	0.7027 1.0	0.0	0.62857	0.0 0.0 0.0	1.0	0.0	1.0	0.0
guu gyr hat hau	guu gyr hat hau	ht ha	0.62745 0.90706 0.94488	0.0 0.00311 0.00262	0.37931 0.32727	0.01802 0.03376	0.57143 0.9313 0.96	0.0 0.00219 0.00183	0.44444 <b>0.95312</b> <b>0.97297</b>	0.0 0.00141 0.00118	0.41724 0.39173	0.01536 0.02548	0.48303 0.49587	0.01168 0.01656
haw heb hil hin	haw heb hil hin	haw iw - hi/hi-Latn	1.0 1.0 1.0 0.62	0.0 0.0 0.0 0.00947	0.17101 0.98305 0.17175	0.0261 9e-05 0.02728	1.0 1.0 1.0 0.62312	0.0 0.0 0.0 0.00914	1.0 1.0 1.0 <b>0.62944</b>	0.0 0.0 0.0 0.00861	0.20205 0.99145 0.19528	0.02124 5e-05 0.02329	0.26818 1.0 0.23664	0.01457 0.0 0.0181
hlt hmn hna hni	hlt hms/hnj/hea hna hni	hmn -	0.92982 0.02198	0.0 0.0	0.41538	0.00119	0.92982 0.02198	0.0 0.0	0.89091	0.0	0.329	0.00059	0.21596	0.00045
hns hrv hsb	hns hrv hsb	hr	0.89655 0.60302 1.0	0.00025 0.00984 0.0	0.44324	0.00383	0.91228 0.62176 1.0	0.0 0.0089 0.0	0.91228 <b>0.69364</b> 1.0	0.0 0.00625 0.0	0.45055	0.00369	0.22002	0.010/2
hun hus huu hye	hun hus huu hye	hu - - hy	0.82192 0.98082 0.98305 1.0	0.00324 0.00037 0.0 0.0	0.21779 1.0	0.01966	0.84507 <b>0.98615</b> 0.96552 1.0	0.00268 0.0 0.0 0.0	0.89552 0.97479 0.96552 1.0	0.00165 0.0 0.0 0.0	0.2649	0.01518	0.33803	0.01063
ibb ibo ido idu	ibb ibo ido idu	ig -	0.98718 <u>0.95</u> 0.0	0.00025 0.00012 0.00012	0.29903	0.01647	0.99355 0.94915 0.0	0.00012 0.0 0.00012	1.0 0.94915	0.0 0.0	0.35484	0.01276	0.46526	0.00801
iii ijs ike ilo	iii ijs ike ilo	- - -	0.97872 0.91339	0.00025 0.00137			0.97872 0.928	0.00024 0.0011	0.97872 <b>0.97479</b>	0.00024 0.00035				
ina isl ita	ina isl ita	is it	0.84892 <b>0.9916</b> 0.78947	0.00249 0.00012 0.00386	0.53953 0.30227	0.00447 0.01259	0.90769 0.9916 0.83916	0.00134 0.00012 0.00268	0.944 0.9916 0.86957	0.00071 0.00012 0.002	0.59184 0.32698	0.0036 0.01121	0.60733 0.39216	0.00335 0.00837
jav jiv jpn kaa	jav jiv jpn kaa	jv - ja/ja-Latn -	0.97581 0.48583 0.7861 0.96667	0.0005 0.01557 0.00984 0.00025	0.22139	0.01601 0.02277	0.97581 0.50847 <b>0.79245</b> 0.96667	0.00049 0.0139 0.00926 0.00024	0.97561 0.53881 0.79245 0.97479	0.00035 0.01155 0.00896 0.00012	0.26517 0.44207	0.01199	0.31892 0.50699	0.00851
kal kan kat kaz	kal kan kat kaz	kn ka kk	0.98305 1.0 1.0 0.96721	0.0 0.0 0.0 0.00037	1.0 1.0 0.39604	0.0 0.0 0.00835	0.98305 1.0 1.0 <b>0.97521</b>	0.0 0.0 0.0 0.00024	0.98305 1.0 1.0 0.96667	0.0 0.0 0.0 0.00024	1.0 1.0 0.41522	0.0 0.0 0.0077	1.0 1.0 <u>0.46154</u>	0.0 0.0 0.00634
kbd kbp kbr kde	kbd kbp kbr	- - -	0.87692 0.85714 0.99174 0.58491	0.00199 0.00249 0.00012			0.87692 0.90909 <u>1.0</u> 0.58491	0.00195 0.00146 0.0	0.87692 0.9375 1.0 0.54360	0.00189 0.00094 0.0				
kdh kea kek	kde kdh kea kek	- - -	0.77551 0.72727 0.97521	0.0 0.0 0.00125 0.00037			0.76289 0.72727 <b>0.9916</b>	0.0 0.0 0.00122 0.00012	0.54369 0.73684 0.69811 0.9916	0.0 0.0 0.00106 0.00012				
kha khm kin kir	kha khm kin kir	- km - ky	0.97521 1.0 0.76336 0.95238	0.00025 0.0 0.00262 0.00075	1.0 0.22599	0.0 0.01875	0.98333 1.0 0.81967 0.95238	0.00012 0.0 0.00146 0.00073	0.97479 1.0 <u>0.8547</u> <b>0.96774</b>	0.00012 0.0 0.00083 0.00047	1.0 0.23211	0.0 0.01809	1.0 0.26374	0.0 0.01516
kjh kkh kmb kmr	kjh kkh kmb kmr	- - ku (Latn)	0.83099 0.99194 0.66667	0.00287 0.00012 0.00735	0.15506	0.02934	0.83099 0.99194 0.66667	0.0028 0.00012 0.00719	0.84892 0.99194 0.66667	0.00236 0.00012 0.00696	0.19125		0.25764	0.01539
knc kng koi	knc kng koi		0.97059 0.96667 0.79389	0.00037 0.00037 0.00037 0.00012	0.13300	0.02754	0.97778 0.0 0.95652 0.79389	0.00024 0.00012 0.00012 0.00012	0.97778 0.0 0.94737	0.00090 0.00024 0.00012 0.00012	0.17123	0.02274	5.25104	3.0.233
koo kor kqn kqs kri	koo kor kqn kqs kri	ko - -	0.79389 0.95238 1.0 0.20896 0.96875	0.00012 0.00075 0.0 0.0 0.0	<u>1.0</u>	0.0	0.79389 0.96774 1.0 0.09524 0.96875	0.00012 0.00049 0.0 0.0 0.0	0.79389 0.99174 1.0 0.03279 0.96063	0.00012 0.00012 0.0 0.0 0.0	1.0	0.0	1.0	0.0
krl ktu kwi lad	krl ktu kwi lad	- - -	0.02581 0.78912 0.837 0.92174	0.0 0.00723 0.0 0.00025			0.02581 0.57944 0.78899 0.92174	0.0 0.0039 0.0 0.00024	0.54369 0.70588 <b>0.92982</b>	0.00354 0.0 0.00012				
lao	lao	lo	<u>1.0</u>	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0

Table 39: Comparison of GlotLID vs CLD3 on UDHR benchmark (part 2)

iso639-3  lat lat lat lat lii lii lii lii lii lil lls lob lot loz ltz lua lua lua lua mad mad mad mam mai mam mam mar maz mcd mcf mcm mic mic mid mlg	lat lvs lia lij lin lit lld lns lob lot loz ltz lua lue lug lun nus mad mag mah mai mal mam mar maz mcd mcf men mic mid	CLD3 Code(s)  la lv lv li	GlotI F1† 0.975 0.93385 0.94643 0.93785 0.99145 0.99145 0.9375 0.53465 0.75345 0.92857 0.72414 0.99145 0.994309 0.92174 0.75385 0.96063 0.75385 0.96063 0.33099 0.93913 0.99174 0.83582	### TPR↓  0.00012 0.00212 0.00212 0.00025 0.0011 0.00174 0.00025 0.0 0.0 0.00174 0.0 0.00075 0.00037 0.00085 0.00062 0.00062 0.0 0.00062 0.0 0.00025	CI F1↑ 0.68222 0.84507 0.43382 0.54054	D3 FPR↓ 0.00474 0.00201 0.00698 0.00465	F1↑ 0.975 0.95618 0.94643 0.53953 1.00 0.96774 0.5567 0.93694 0.84892 0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 0.76562	D-M θ=.3  FPR↓  0.00012 0.00134 0.0 0.01195 0.0 0.00022 0.00012  0.00012  0.00002 0.00002 0.00002 0.0000000000	GlotLID  F1↑  0.97071  0.96386  0.92727  0.64804  1.0  0.98361  0.51685  0.98305  0.98305  0.98305  0.98305  0.98307  0.98307  0.98307  0.98307  0.98307  0.98307  0.98307  0.98307  0.98307  0.98307  0.98307  0.98592  0.82707  0.89286	FPR↓ 0.00012 0.00106 0.0 0.00731 0.0 0.00024 0.00071  0.0 0.00035 0.0 0.00024 0.0 0.00035 0.0 0.00035 0.0 0.00035	CLD3 F1↑ 0.70732 0.89888 0.53153 0.57282	8 0=.5 FPR↓ 0.0041 0.00123 0.00469 0.00396	CLD: F1↑ 0.76159 0.94118  0.63784  0.63441	3 <i>θ</i> =.7 FPR↓ 0.00294 0.00068  0.00299  0.00303
lat lav lav lia lij lii lit lit lob lot lotz luz luz luz luz luz luz lun lun lus mad mag mad mam mai mam mar maz mcd mcf mic miq mkd	lat lvs lia lij lin lit lld lns lob lot loz ltz lua lue lug lun nus mad mag mah mai mal mam mar maz mcd mcf men mic mid	la lv	0.975 0.93385 0.94643 0.49785 0.99145 0.9375 0.53465 0.92857 0.84892 0.98305 0.72414 0.99145 0.99145 0.9980 0.2174 0.75385 0.94309 0.92174 0.75385 0.96063 0.83099 0.933913 0.99174 0.83582	0.00012 0.00212 0.00212 0.001445 0.00025 0.0011 0.00174 0.00025 0.0 0.0 0.00174 0.00037 0.00037 0.00037 0.0005 0.0005 0.00062 0.00062 0.0005	0.68222 0.84507 0.43382 0.54054	0.00474 0.00201 0.00698	0.975 0.95618 0.94643 0.53953 1.0 0.96774 0.5567 0.93694 0.84892 0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 0.76562	0.00012 0.00134 0.0 0.01195 0.0 0.00049 0.00122 0.00012 0.00122 0.00049 0.000049 0.000012 0.000012	0.97071 0.96386 0.92727 0.64804 1.0 0.51685 0.93578 0.84892 0.98305 0.78848 0.99145 0.99145 0.99592 0.82707 0.97479 0.89286	0.00012 0.00106 0.0 0.00731 0.0 0.00024 0.00071 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	0.70732 0.89888 0.53153	0.0041 0.00123 0.00469	0.76159 0.94118 0.63784	0.00294 0.00068 0.00299
lav lia lij lij lin lit litl lltl lns lob lot loz ltz lua lug lug lun lus mad mag mah mai man man mar mar maz mcd men miq miq mic mid mkd	lvs in in iii iii iii iii iii iii iii iii	lv	0.9385 0.9463 0.49785 0.99145 0.9375 0.53465  0.92857  0.84892 0.98305 0.72414 0.99145 0.99145 0.99145 0.9916 0.99161 0.95063 0.83099 0.9309	0.00212 0.01445 0.00025 0.0011 0.00174 0.00025 0.0 0.0 0.00174 0.00037 0.00037 0.00085 0.00062 0.00062 0.00062	0.84507 0.43382 0.54054	0.00201	0.95618 0.94643 0.53953 1.0 0.96774 0.5567 0.93694 0.84892 0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 0.92174	0.00134 0.0 0.01195 0.0 0.00049 0.00122 0.00012 0.0 0.0 0.0 0.00122 0.0 0.00049 0.00012 0.00061	0.96386 0.92727 0.64804 1.0 0.98361 0.51685 0.93578 0.84892 0.98305 0.78846 0.99145 0.98592 0.82707 0.87270	0.00106 0.0 0.00731 0.0 0.00024 0.00071 0.0 0.0 0.0 0.00035 0.0 0.00024 0.0 0.00035 0.0	0.89888 0.53153	0.00123 0.00469	0.94118 0.63784	0.00068
lia lij lin lin lit lld lns lob lot loz ltz lua lue lue lug lun mad man man mar mar mar med men mef miq mid mkd mkd	lia lij ji j		0.94643 0.49785 0.99145 0.99145 0.9375 0.53465 0.92857 0.84892 0.98305 0.72414 0.99145 0.9589 0.81752 0.94309 0.2174 0.75385 0.9663 0.83099 1.0 0.93913 0.99174 0.83582	0.0 0.01445 0.00025 0.00174 0.00025 0.0 0.0 0.00174 0.0 0.00075 0.00087 0.0 0.0005 0.00062 0.00062 0.0 0.00025	0.43382 0.54054	0.00698	0.94643 0.53953 0.96774 0.5567 0.93694 0.84892 0.98305 0.99145 0.99122 0.8209 0.9586 0.92174 0.976562	0.0 0.01195 0.0 0.00049 0.00122 0.00012 0.0 0.0 0.00122 0.0 0.00049 0.00012 0.00012 0.00010 0.00010 0.00010	0.92727 0.64804 1.0 0.98361 0.51685 0.93578 0.84892 0.98305 0.78846 0.99145 0.98592 0.82707 0.97479 0.89286	0.0 0.00731 0.0 0.00024 0.00071 0.0 0.0 0.0 0.00035 0.0 0.00024 0.0 0.00035	0.53153	0.00469	0.63784	0.00299
lin lit lld lld lln llot lot lot lot lot lua lue lue lug lun lus mad mag man man maz maz mcd mcf men mfq mic mid mlg	lin lid lid lns lob lot lot loz llz lz lz lz lz lun lue lug lun lus mad mag mah mai mal mam mar maz med mef men mic mid mid mid mid		0.99145 0.9375 0.53465 0.92857 0.92857 0.98305 0.72414 0.99145 0.9518 0.81752 0.94309 0.92174 0.75385 0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.00025 0.001 0.00174 0.00025 0.0 0.00174 0.00037 0.00037 0.00037 0.0005 0.0005 0.00062 0.00062 0.00062	0.54054		1.0 0.96774 0.5567 0.93694 0.84892 0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 0.76562	0.0 0.00049 0.00122 0.00012 0.0 0.00122 0.0 0.00049 0.00012 0.00061 0.0	1.0 <u>0.98361</u> 0.51685 0.93578 0.84892 0.98305 <u>0.78846</u> 0.99145 <u>0.98592</u> <u>0.82707</u> <u>0.97479</u> 0.89286	0.0 0.00024 0.00071 0.0 0.0 0.0 0.00035 0.0 0.00024 0.0 0.00035 0.0				
lit lld lns lob lot lot loz ltz lua lue lue lug lum mad mag mag mah mai man mar maz med mef men miq mid mkd	lit Ild Ins Iob Iot Ict Ict Itz Iua Iue Iug Iun Ius mad mag mah mai mal mam mar mar mar mar mar mar men mic mid		0.9375 0.53465 0.92857 0.98305 0.72414 0.9915 0.9589 0.81752 0.94309 0.92174 0.75385 0.96063 0.83099 0.93913 0.99174 0.83582	0.001 0.00174 0.00025 0.0 0.00174 0.0 0.00075 0.00075 0.0005 0.0005 0.0005 0.00062 0.0 0.0 0.0005	0.54054		0.96774 0.5567 0.93694 0.84892 0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 0.76562	0.00049 0.00122 0.00012 0.0 0.0 0.00122 0.0 0.00049 0.00012 0.00061 0.0	0.98361 0.51685 0.93578 0.84892 0.98305 0.78846 0.99145 0.982707 0.82707 0.89286	0.00024 0.00071 0.0 0.0 0.00035 0.0 0.00024 0.0 0.00035				
Ins Iob Iob Iot Iot Ioz Itz Iua Iue Iug Iun Ius mad man man man man mar maz med mef men miq mid	Ins Lob Lob Lot Loc	- - - - - - - ml	0.92857  0.84892 0.98305 0.72414 0.99145 0.9589 0.81752 0.94309 0.92174 0.75385 0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.00025 0.0 0.0 0.00174 0.0 0.00075 0.00037 0.00087 0.0005 0.0005 0.00062 0.0 0.0 0.0		0.00465	0.93694 0.84892 0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 0.76562	0.00012 0.0 0.0 0.00122 0.0 0.00049 0.00012 0.00061 0.0	0.51685 0.93578 0.84892 0.98305 <u>0.78846</u> 0.99145 <u>0.98592</u> <u>0.82707</u> <u>0.97479</u> 0.89286	0.0 0.0 0.00035 0.0 0.00024 0.0 0.00035 0.0	0.57282	0.00396	0.63441	0.00303
lob lot loz ltz lua lue lug lun lus mad mag mah mai mal mam mar men mer mfq mic mid mkd mlg	lob lot loz loz luz lua lue lug lun lus mad mag mah mai mal mar mar mar mac med mef men mic mid mid mid mid mid mid mid mid men mid	- - - - - - - ml	0.84892 0.98305 0.72414 0.99145 0.91752 0.94309 0.92174 0.75385 0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.0 0.0 0.00174 0.0 0.00075 0.00037 0.00087 0.0 0.0005 0.00062 0.0 0.0 0.00025		0.00465	0.84892 0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 <b>0.76562</b>	0.0 0.0 0.00122 0.0 0.00049 0.00012 0.00061 0.0	0.84892 0.98305 <b>0.78846</b> 0.99145 <b>0.98592</b> <b>0.82707</b> <b>0.97479</b> 0.89286	0.0 0.0 0.00035 0.0 0.00024 0.0 0.00035	0.57282	0.00396	0.63441	0.00303
loz ltz lua lue lug lun lus mad mag mah mai man mar mar med mef men mic mid mkd mkd	loz luz lua lue lug lun lus mad mag mah mai mal mam mar maz mcd mef men mid mid men mid men mid men mid mid men mid mid men mid mid mid men mid mid mid men mid mid mid mid men mid	- - - - - - - ml	0.98305 0.72414 0.99145 0.9589 0.81752 0.94309 0.92174 0.75385 0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.0 0.00174 0.0 0.00075 0.00037 0.00087 0.0 0.0005 0.00062 0.0 0.0 0.00025		0.00465	0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 <b>0.76562</b>	0.0 0.00122 0.0 0.00049 0.00012 0.00061 0.0	0.98305 0.78846 0.99145 0.98592 0.82707 0.97479 0.89286	0.0 0.00035 0.0 0.00024 0.0 0.00035 0.0	0.57282	0.00396	0.63441	0.00303
Itz Iua Iue Iue Iug Iulu Ius Ius mad mag mah mai mal mam mar maz mcd mcf men mfq mic mic mid mkd mlg	ltz lua lue lug lur lus mad mag mah mai mal man mar mar mar maz mcd mcf men mic mic mid	- - - - - - - ml	0.98305 0.72414 0.99145 0.9589 0.81752 0.94309 0.92174 0.75385 0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.0 0.00174 0.0 0.00075 0.00037 0.00087 0.0 0.0005 0.00062 0.0 0.0 0.00025		0.00465	0.98305 0.75 0.99145 0.97222 0.8209 0.95868 0.92174 <b>0.76562</b>	0.0 0.00122 0.0 0.00049 0.00012 0.00061 0.0	0.98305 0.78846 0.99145 0.98592 0.82707 0.97479 0.89286	0.0 0.00035 0.0 0.00024 0.0 0.00035 0.0	0.57282	0.00396	0.63441	0.00303
lua lue lue lug lun lun lus mad mag mah mai mar mar mcd mcf mic mid mkd mlg mkd mlg mlg mkd mlg	lua lue lug lun ius mad mag mah mai mai man mar mac mcd mcf men mic mic mic mic mic mic	- - - - - - - ml	0.72414 0.99145 0.9589 0.81752 0.94309 0.92174 0.75385 0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.0 0.00075 0.00037 0.00087 0.0 0.0005 0.00062 0.0 0.0 0.00025	1.0		0.75 0.99145 0.97222 0.8209 0.95868 0.92174 <b>0.76562</b>	0.0 0.00049 0.00012 0.00061 0.0	0.99145 0.98592 0.82707 0.97479 0.89286	0.0 0.00024 0.0 0.00035 0.0				
lug lun lus mad mag mah mai mal mar mar mar mcd mcf men miq miq mid mkd mlg	lug lun lus mad mag mah mai mal man mar mac mcd mef men mic mic mic mic mic mic	-	0.9589 0.81752 0.94309 <b>0.92174</b> 0.75385 0.96063 <b>0.83099</b> 1.0 0.93913 <b>0.99174</b> 0.83582	0.00075 0.00037 0.00087 0.0 0.0005 0.00062 0.0 0.0 0.00025	1.0		0.97222 0.8209 0.95868 0.92174 <b>0.76562</b>	0.00049 0.00012 0.00061 0.0	0.98592 0.82707 0.97479 0.89286	0.00024 0.0 0.00035 0.0				
lun lus mad mag mah mai mai mal mam mar maz mcd mcf men mfq mic mid mkd mlg	lun lus mad mah mai man mar maz med mef men men mie mie mie mie mie	-	0.81752 0.94309 0.92174 0.75385 0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.00037 0.00087 0.0 0.0005 0.00062 0.0 0.0 0.00025	1.0		0.8209 0.95868 0.92174 <b>0.76562</b>	0.00012 0.00061 0.0	0.82707 0.97479 0.89286	0.0 0.00035 0.0				
mad mag mah mai mal man mar maz mcd mef men mfq mic mid mkd mlg	mad mag mah mai man mar maz med mef men miq miq miq miq	-	0.92174 0.75385 0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.0 0.0005 0.00062 0.0 0.0 0.00025	1.0		0.92174 0.76562	0.0	0.89286	0.0				
mah mai mal mal mam mar maz mcd mcf men mfq mic mic mid mid mkd mlg	mah mai mal mar maz mcd mcf men mfq miq miq mkd	-	0.96063 0.83099 1.0 0.93913 0.99174 0.83582	0.00062 0.0 0.0 0.00025	1.0			0.00024	0.76562					
mai mal mam mar maz mcd mcf men mfq mic miq mid mkd mlg	mai mal mam mar maz med mef men mic mic mic mid pltd	-	0.83099 1.0 0.93913 0.99174 0.83582	0.0 0.0 0.00025	1.0					0.00024				
mam mar maz mcd mcf men mfq mic mic miq mkd mlg	mam mar maz med mef men mic mic miq mkd	-	0.93913 0.99174 0.83582	0.00025	1.0		0.83099	0.0	1.0 0.83099	0.0				
mar maz med mef men mfq mic miq mkd mlg	mar maz mcf men miq mic miq mkd plt	mr - - -	0.83582			0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
maz mcd mcf men mfq mic miq mkd mlg	maz med mef men mfg mic niq mkd pht	- - - -	0.83582		0.28362	0.01328	0.95575 0.99174	0.0 0.00012	0.94643 0.99174	0.0 0.00012	0.30287	0.01208	0.35258	0.00955
mcf men mfq mic miq mkd mlg	mcf men mfg mic mic mkd pht	-	0.97521	0.00212			0.85496	0.00171	0.896	0.00094				
men mfq mic miq mkd mlg	men mfq mic miq mkd plt	-	1.0	0.00025			0.9916 1.0	0.0	0.98305 1.0	0.0				
mic miq mkd mlg	mic miq mkd plt	-	0.9771	0.00037			0.9771	0.00037	0.99225	0.00012				
mkd mlg	mkd plt		0.88722 0.15625	0.00187			0.95935	0.00061	0.9916	0.00012				
mlg	plt	-	0.832	0.0	0.05000		0.832	0.0	0.832	0.0	0.00	0.00040	0.00044	
		mk mg	0.99174 0.93913	0.00062	0.95238 0.70886	0.00023	0.99174 0.96429	0.0 0.00024	0.99174 0.97297	0.0 0.00012	0.96 0.77778	0.00018 0.00146	0.98361 0.86822	5e-05 0.00077
	mlt	mt	0.77419	0.00436	0.15267	0.03038	0.78947	0.0039	0.82759	0.00295	0.17857	0.02516	0.22599	0.0186
mnw mon	mnw khk	- mn	0.88276	0.00199	0.27928	0.01446	0.9771	0.00024	0.98462	0.00012	0.29314	0.01349	0.33983	0.01054
mor	mor	-	0.9916	0.0	0.27720	0.01110	0.9916	0.0	0.9916	0.0	0.27511	0.01519	0.0000	0.01051
mos mri	mos mri	- mi	0.97015 0.8227	0.0005 0.00025	0.2	0.02053	0.98485 0.82857	0.00024 0.00012	0.99237 0.82857	0.00012 0.00012	0.23695	0.01632	0.28502	0.0124
msa	zlm/min/ind	id/ms	0.86842	0.0076	0.44054	0.01537	0.89535	0.00549	0.91124	0.00424	0.5088	0.0103	0.45511	0.00588
mto mxi	mto mxi	-	<u>0.0</u>	0.001			0.0	0.00037	0.0	0.00012				
mxv	mxv	-	0.14925	0.0			0.12121	0.0	0.0625	0.0				
mya mzi	mya mzi	my	0.66667	0.00723	0.5042	0.00538	0.66667	0.00707	0.67045	0.00672	0.5042	0.00538	0.5042	0.00534
nav	nav	-	0.9916	0.00012			1.0	0.0	1.0	0.0				
nba ndo	nba ndo	-	0.8806	0.00199			0.90076	0.00158	0.95161	0.00071				
nds	nds	-	1.0	0.0			1.0	0.0	1.0	0.0				
nep nhn	npi nhn	ne	0.99115	0.0	0.24675	0.01588	0.99115	0.0	0.99115	0.0	0.26207	0.01463	0.29867	0.01186
nio	nio	-												
niu niv	niu niv	-	1.0	0.0			1.0	0.0	1.0	0.0				
njo	njo	-	0.95312	0.0			0.95312	0.0	0.95312	0.0				
nku nld	nku nld	nl	0.70659	0.00611	0.80272	0.00132	0.71084	0.00585	0.71515	0.00554	0.80822	0.00128	0.84286	0.001
nor	nob/nno	no	0.97619	0.00062	0.87455	0.00151	0.984	0.00037	0.99194	0.00012	0.88727	0.00132	0.88971	0.00122
not nso	not nso	-	0.97391 0.86957	0.0 0.00224			0.97391 0.87591	0.0	0.97391 0.88235	0.0 0.00189				
nya	nya	ny	0.96414	0.00112	0.21838	0.03914	0.97581	0.00073	0.99588	0.00012	0.24948	0.03286	0.31957	0.02308
nym nyn	nym nyn	-	0.85938	0.0			0.85938	0.0	0.85938	0.0				
nzi	nzi	-	1.0	0.0			1.0	0.0	1.0	0.0				
oaa oci	oaa oci	-	0.41101	0.0			0.40516	0.0	0.38131	0.0				
ojb	ojb	-	0.7027	0.0			0.7027	0.0	0.66667	0.0				
oki orh	oki orh	-												
oss	oss		0.50273	0.0076			0.50549	0.00731	0.50829	0.00696				
ote pam	ote pam		0.0 1.0	0.00411			0.0 1.0	0.00329	0.0 1.0	0.0013				
pan	pan	pa	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
pap pau	pap pau	-	0.79195 <b>0.97436</b>	0.00386			0.83099 0.97436	0.00293	0.86765 0.97436	0.00212				
pbb	pbb	-	0.71698	0.00536			0.76056	0.00354	0.816	0.00177				
pcd pcm	ped pem	-	0.71739	0.0			0.71739	0.0	0.71739	0.0				
pis	pis	-	0.9916	0.0			0.9916	0.0	0.9916	0.0				
piu pnb	piu pnb		0.65969	0.0076			0.65969	0.00744	0.65969	0.00719				
pol	pol	pl	0.74074	0.00523	0.40134	0.00817	0.76923	0.00439	0.81633	0.00318	0.47244	0.00611	0.56872	0.00412
pon por	pon por	- pt	0.85106	0.0 0.00523	0.65217	0.00584	1.0 0.87273	0.0 0.00427	1.0 <b>0.89219</b>	0.0 0.00342	0.70381	0.0046	0.7619	0.00339
pov	pov	- -	0.96552	0.0	3.00217	3.00304	0.96552	0.0	0.95652	0.0	5.70501	0.0070	0.701)	5.00559
ppl pus	ppl pbu	ps	0.42105 0.75	0.0	0.90769	0.0005	0.20896 0.75	0.0	0.125 0.75	0.0	0.92187	0.00041	0.95935	0.00018
que	que/qxn/qvh/quh/qvc/qxu/quz/qvn/qug/qwh/qvm/quy/quc/qva	ps -	0.919	0.01146	5.55109	0.0003	0.93737	0.0067	0.9491	0.00365	0.72107	5.55041	000000	0.00010
rar rgn	rar rgn	-	0.99174	0.00012			0.99174	0.00012	0.99174	0.00012				
rmn	rmn		0.86636	0.00012			0.86111	0.00012	0.85047	0.00012				
roh ron	roh ron	ro ro	0.99268 0.81328	0.00	0.66443	0.00456	0.99145 0.80833	0.00536	0.98775 <b>0.82906</b>	0.0 0.00448	0.73606	0.00324	0.79839	0.00226
run	run	-	0.87591	0.00212	0.00443	0.00420	0.88889	0.00183	0.90909	0.00141	0.73000	0.00024	0.17039	0.00220
rup rus	rup rus	ru/ru-Latn	0.125 0.43478	0.0 0.01944	0.32345	0.01145	0.125 0.47431	0.0 0.01621	0.09524 0.51064	0.0 0.01356	0.35191	0.01007	0.4	0.00815
sag	sag	ru/ru-Lath	0.81553	0.0	0.32343	0.01143	0.80392	0.0	0.79208	0.0	0.55191	0.0100/	0.4	0.00813
sah	sah	-	0.54128	0.01246			0.56459	0.01109	0.60513	0.00908				

Table 40: Comparison of GlotLID vs CLD3 on UDHR benchmark (part 3)

GlotLID-M CLD3 GlotLID-M  $\theta$ = 3 GlotLID-M  $\theta$ =.5 CLD3  $\theta = 5$ CLD3  $\theta = 7$ UDHR Code(s) CLD3 Code(s) FPR↓ FPR. FPR↓ iso639-3 F1 F11 FPR. F11 0.66667 0.0 0.6666 san 0.66667 0.0 0.00012 sco sco 0.0005 0.95 0.0 0.00012 0.94118 0.02985 0.88889 0.99145 0.27397 0.0005 0.00037 sey shk shn shp sid sey shk shn shp sid 0.88889 0.99145 0.25 0.86792 0.99145 0.14706 0.0 0.0 0.0015 0.90625 0.00146 0.00083 0.90625 0.94309 0.0 sin si 1.0 0.0 <u>1.0</u> 1.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 sin skr slk slr slv skr slk slr slv sk 0.88889 0.00187 0.6 0.00365 0.9375 0.00098 0.94488 0.00083 0.67416 0.00264 0.00145 0.78146 0.0015 0.00025 0.00073 0.00024 **0.97561** 0.96667 0.90909 0.67045 0.0026 0.00214 0.78667 sme 0.96667 0.96667 0.00024 0.0037 0.00154 smo smo 0.0 0.6087 1.0 0.0 1.0 0.0 0.65969 0.00296 0.7875 1.0 0.93846 sna snd snk snk sna sn sd 0.001 0.23282 0.01834 0.96063 0.00061 0.98387 0.00024 0.30576 0.01262 0.40132 0.00824 0.00233 0.00223 0.00158 snk 0.60773 0.75817 0.98333 0.0 0.00461 0.00012 0.57627 0.80556 0.0 0.00341 0.425 **0.89231** 0.12141 0.03759 0.00165 0.13919 0.03208 0.1699 0.4461 0.43011 0.02516 som som so st sot sot 0.35398 0.00999 0.9916 0.75701 0.0 0.9916 0.0 0.4 0.0082 0.00674 0.78 0.89394 0.0046 0.40506 0.72321 0.00748 0.38835 0.01136 0.0061 0.01057 0.00946 spa sqi src srp srr spa als src srp 0.41667 0.85714 0.00249 0.29703 0.01296 0.86131 0.00219 0.00153 0.36036 0.00971 0.0076 0.5124 0.89231 0.94891 0.00748 0.45455 0.00383 0.4958 0.00719 0.48945 0.45455 0.00383 0.45802 0.00371 srr 0.0015 0.00075 0.93443 0.00061 0.9661 0.99237 0.00012 0.97015 ssw suk sun sus swa swb swe tah ssw suk sun sus swh swb swe tah 0.00037 0.0 0.71895 0.9771 0.95798 0.89051 0.86885 0.00448 0.68712 0.00586 0.69136 0.00561 0.9697 0.92683 0.85315 0.80292 0.00380 0.00037 0.001 0.00262 0.94215 0.86525 0.84615 0.00301 0.00024 0.00073 0.00232 0.00195 0.00024 0.00047 0.00177 0.00118 0.3416 0.01077 0.3949 0.00852 0.48062 0.00593 sw 0.09772 0.0505 0.11101 0.04375 0.14118 0.03299 0.00287 sv 0.00068 0.89362 0.00046 0.00027 0.86897 0.00237 0.93333 0.0011 0.0 0.92647 0.95455 0.91892 0.00012 0.91892 0.00012  $0.927\overline{27}$ 0.0 tai tam tat tbz 0.66667 0.0 0.66667 0.0 taj tam tat tbz tca tdt tel tem tet tgk tgl tha tir tiv tob toi toj ton top tpi tsn tso ta 1.0 0.68208 0.0 0.0 0.0 0.0 1.0 0.0 1.0 0.0 <u>1.0</u> 0.68208 0.18182 0.00673 0.69822 0.09524 0.00589 0.20896 0.0 0.9916 0.65537 tca tdt 0.9916 0.0 0.9916 0.0 0.0 0.66292 0.00735 0.66292 0.00719 0.00696 te 0.0 <u>1.0</u> 0.0 0.0 0.0 1.0 0.0 1.0 0.0 tem tet tgk tgl tha 0.97345 0.0 0.97345 0.0 0.94545 0.0 0.85507 0.464 0.00607 0.92913 0.0011 0.95082 0.97674 0.00551 tg 0.52252 0.9403 0.00087 0.95455 0.00061 0.00024 1.0 1.0 0.98551 0.0 0.0 1.0 1.0 0.0 0.0 1.0 0.0 1.0 0.0 0.0 1.0 0.0 0.0 tir tiv tly tob toi toj ton top tpi tsn 0.00025 0.0 0.0 1.0 0.97561 0.00037 0.98361 0.00024 0.99174 0.00012 0.83688 0.000250.0  $0.0 \\ 0.0$ 0.83688 0.00024 0.84892 1.0 0.99174 0.98361 0.98361 0.94158 0.0 1.0 0.0 0.0 0.00012 0.99174 0.00012 0.99174 0.00012 0.00012 0.00012 0.00025 0.00174 0.99174 0.98361 **0.99174** 0.94158 0.00012 0.00012 0.00012 0.00171 0.99174 0.98361 0.99174 **0.95139** 0.00012 0.00012 0.00012 0.0013 0.82517 0.00299 0.86765 0.00207 0.90625 0.00118 tsz tuk tur twi tyv tzh tsz tuk tur twi tyv tzh 0.98347 0.51502 0.9685 0.96748 0.49383 0.001 0.96748 0.00098 0.00047 0.00098 0.01451 0.00122 0.00012 0.00024 0.01533 0.25641 0.01588 0.50209 0.01332 0.27907 0.01413 0.31088 0.01204 0.95349 0.98361 0.98333 0.96094 0.99174 0.98333 0.00094 0.00012 tzm tzm tzo udu uig ukr 0.01754 0.00648 0.01754 0.00634 0.0177 0.98305 0.00601 0.91734 0.98305 0.99174 0.91403 0.98361 0.87931 0.97479 0.00012 0.0 0.0 0.99174 0.98361 0.00025 0.00012 0.00012 0.91892 0.98361 0.87931 0.82963 0.0 0.00025 0.00012 0.00012 0.65169 0.00274 0.99174 0.00232 0.80556 0.00118 umb umb 0.00125 0.00122 0.87611 0.82963 0.00083 ura urd uzb vai vec ura urd 0.0 0.82963 0.0 0.0 0.96522 0.70414 шr 0.00087 0.62678 0.00589 0.96522 0.00085 0.96522 0.00083 0.63218 0.15504 0.00574 0.63218 0.0057 uzn vai vec 0.01233 0.1326 0.03308 0.78033 0.00805 0.86545 0.00424 0.02707 0.19017 0.02041 0.88889 0.95238 0.00073 0.00187 0.96774 0.00047 ven vep vie ven 0.0 1.0 0.0 1.0 0.0 vep vie vi 0.66304 0.95798 0.00012 0.07687 0.06405 0.66304 0.00012 0.66304 0.00012 0.08671 0.05578 0.10932 0.04222 vmv war wln vmw war wln wol 0.97436 0.9916 0.62434 0.86897 0.00025 0.0 0.97436 0.0 0.9916 0.62105 0.79747 0.0 0.00885 0.00399 0.0 0.9916 0.9916 0.64481 0.92537 0.87356 0.00853 0.00232 0.00755 0.00106 wol wwa xho wwa xho 0.88636 0.94574 0.0 0.88636 0.0 0.00087 0.00049 xh 0.01496 0.00035 0.00796 0.26339 0.96825 0.976 0.29949 0.01249 0.39322 xsm yad yao xsm yad yao yap ydd ykg yor yrk yua 0.8785 0.97345 0.96721 0.85714 0.0 0.0 0.75 0.0 0.00012 0.0 0.0 0.0 0.00012 0.0 0.0 0.00025 0.00025 0.98214 0.98333 0.98214 0.98333 yap yid ykg yor yrk yua zam 0.0 1.0 0.0 yi 1.0 0.0 1.0 0.0 1.0 1.0 0.93023 0.69565 1.0 yo 0.85106 0.00262 0.0 0.01323 0.88889 0.00183 0.00106 0.0 0.00852 0.0 0.00529 0.00202 0.00012 0.00 0.00012 0.00237 0.83495 0.0 0.8381 0.78125 0.78125 zam zdj zgh zho 0.88496 0.00049 0.8972 0.0 zdj zgh 0.17647 0.71795 0.0 0.17647 0.0 0.07015 0.75177 cjy/hak/wuu/yue/cmn/gan/hsn/nan zh/zh-Latn 0.81359 0.01802 0.73346 0.0629 0.05459 0.85431 0.0134 0.88293 0.01 0.65591 0.92683 0.00075 0.0005 0.01807 0.66304 0.00049 0.00012 0.00024 0.0 0.44492

with confidence threshold  $\boldsymbol{\theta}$ 

Table 41: Comparison of GlotLID vs CLD3 on UDHR benchmark (part 4)

0.95

GlotLID-M  $\theta$ =.3 FT176 θ=.5 GlotLID-M FT176 GlotLID-M  $\theta$ =.5 FT176 θ=.3 FPR iso639-3 UDHR Code(s) FT176 Code(s) F1↑ FPR. F1↑ FPR. F1↑ FPR. F11 FPR. F1↑ FPR. F1↑ abk abk 0.91603 0.58635 0.91045 0.83495 0.95238 ace acu ada ady afr ace 0.00129 0.91603 0.00126 0.91603 0.00122 acu ada ady afr 0.00129 0.00 0.00154 0.0 0.00077 0.0 0.00114 0.0 0.58635 0.58065 0.00098 0.0 0.00037 0.9313 0.83495 0.93846 0.83495 af 0.84553 0.00052 0.00051 0.97561 0.90909 0.96774 0.92857 0.0 0.0 0.81429 0.00039 0.82014 0.00025 0.00024 agr aii ajg alt 0.64516 0.95495 0.0085 0.00039 0.65217 **0.96364** 0.00808 0.00025 0.0077 0.00024 0.65574 0.96364 ajg alt amc ame amh ami amc  $0.0 \\ 0.0 \\ 0.0$ 1.0 1.0 0.125  $0.0 \\ 0.0 \\ 0.0$ 1.0 1.0 0.09524 1.0 1.0 0.20896 0.0 0.00283 0.26667 0.00276 0.25503 0.00268 0.35443 amr ara arg arl amr 0.89552 0.0 0.99187 0.0 0.99187 0.0 arb ar/arz 0.0018 0.64171 0.00316 0.93023 0.00114 0.98361 0.00024 0.66298 0.0028 0.66667 0.00268 an 5e-05 0.99187 0.93913 0.97521 0.0 0.00013 0.99187 0.99187 0.94737 arn arn 0.94737 0.97521 0.0 0.0 ast auc ava ayr aze bak ast ast 0.00013 0.47059 0.00203 0.00013 0.98333 0.0 0.62626 0.00032 0.57471 4e-05 0.01504 0.0 av 0 5e-05 0.99174 0.6413 0.00013 0.00837 0.00013 0.00821 0.0 0.00758 az/azb 0.23529 0.01178 0.6413 0.26914 0.00864 0.00678 azb/azj 0.64658 0.29367 ba 0.0009 0.00113 0.00088 0.00086 0.00096 0.00076 bam ban 0.49682 0.00747 0.5098 0.00682 0.00513 ban 0.98361 0 5e-05 bar baı bax bax bba bci bcl bba bci bcl bel bem ben bfa bho 0.92187 0.00116 0.92913 0.00101 0.93548 0.00073 0.97521 1.0 0.98333 0.98333 0.00110 0.00039 0.0 0.0 0.00013 0.0 0.9916 1.0 0.9916 0.0 0.62105 0.98333 0.98333 bel be 0.0033 0.98333 0.0 0.66667 0.00262 0.83688 0.00094 bem ben bfa bho 0.00025 0.98333 0.00026 0.00024 bn 0.0 0.97674 0.00014 1.0 0.0 1.0 0.0 0.0 1.0 0.0 1.0 1.0 0.78519 0.9927 0.00039 0.78519 0.00038 0.77273 0.00024 bin bin 0.00013 1.0 1.0 0.0 1.0 0.0 bis blt boa bod bre buc bug bul bis blt 1.0 0.0 0.0 1.0 0.0 boa bod 0.99213 **0.89091** 0.89091 bo br 0.00283 0.66667 0.00276 0.00268 0.00013 0.66667 0.89091 0.00013 0.00012 0.66667 bre 0.98361 0.0 0.00354 0.98361 0.0 0.98361 0.0 0.86131 0.00074 0.92683 0.00018 buc bug bul 0.00064 0.00064 0.00051 0.00063 0.976 0.97561 0.00024 0.00037 0.95312 0.00085 0.85294 0.89231 0.00055 0.00013 0.96 0.95868 bg bum 0.54762 0.00026 0.53659 0.00013 0.46154 0.00012 bum bxr cab cak cat cbi cbk cbr cbs cbt ccp ceb ces cfm cha che chi che chi che cin ces bxr 0.00024 9e-05 0 cab cak 0.0 0.0 0.00103 0.0 0.0 0.00076 0.9375 0.95238 0.43165 0.00745 0.96774 0.99225 0.00049 0.00299 0.00116 cat ca 0.64865 0.81379 cbi 0.9771 0.00026 0.99225 0.0 0.0 cbk 0.00039 0.0008 0.00038 0.00024 0.00032 0 0.00039 0.54321 0.61053 0.7033 0.67308 0.97479 0.0 cbs cbt 0.66 0.97479 0.0 0.00013 0.00013 0.98305 0.0 cbu 0.18462 0.0 0.09677 0.0 0.03333 0.0 ccp ceb ceb 0.00051 0.9916 0.00013 0.65909 0.98387 ces cfm cs  $\frac{0.98387}{0.85714}$ 0.0 0.4 0.00834 0.98387  $0.0 \\ 0.0$ 0.0 0.60606 0.00345 0.76433 0.00152 0.0 0.85714 0.84615 0.0 cha 0.8381 0.00013 0.82353 0.0 0.8 0.0 0.00052 ce 0.00391 0.15385 0.97479 chk chr chv cic cjk 0.97521 0.00013 0.98333 0.0 0.0 0.03333 0.0 cv 0.86154 0.0 0.86154 0.0 0.86154 0.86154 0.0 0.86154 0.0 0.84375 0.0 0.0 0.00039 0.00038 0.92035 0.00012  $\frac{0.92641}{0.65217}$ 0.92641 cjs ckb cjs ckb 0.0 0.65217 0.0 0.63736 0.0 ckb 0.0 0.0 0.0 0.0 0.0 0.0 cnh cni cof 0.00101 0.00152 cnh 0.93023 0.00116 0.9375 0.00086 0.94488 0.00167 0.00134 cni 0.90909 0.63736 0.91603 0.54118 cof 0.74747 0.0 0.0 0.0 cos kw 0.00698 0.00032 cos 0.98305 0.96774 0.89908 0.98305 0.96774 0.89908 0.00012 со 0.0 0.03077 0.00019 0.0 0.00025 0.98305 0.0 0.0 0.00026 0.98503 0.97561 0.89908 cpu crh cri crs csa csw cpu crh 0.0 0.00026 0.0 0.00025 0.0 0.00024 0.98361 0.98361 0.98361 cri crs csa 0.85185 0.00026 0.85185 0.00025 0.80769 0.00024 1.0  $\begin{array}{r} \underline{0.0} \\ \underline{0.78431} \\ \underline{1.0} \end{array}$ 0.00206 0.0 0.00051 csw 0.0 0.78431 1.0 0.0 ctd cym dag dan ddn deu dga dip diq div duu dyo dyu dzo ell emk eml eng epo ese ctd 0.74747 0.22303 0.01999 0.0 0.65574 0.0028 0.85938 0.00049 cym dag dan ddn су da 0.85135 0.00283 0.65922 0.00269 0.91304 0.00152 0.00024 0.00119 0.98437 0.7973 0.00058 0.86567 deu dga dip de 0.00013 0.00566 0.35242 0.02079 0.98745 0.00013 0.98745 0.00012 0.73394 0.004 0.861310.00161 0.0048 0.00318 diq dv 0.00129 0.00071 0.00038 0.00024 0.93333 0.0 div 0.96774 0.0 1.0 0.0 0.96774 0.0 0.0 1.0 1.0 0.0 0.0 0.00811 0.96491 0.17323 0.97391 0.0 0.00783 0.0 0.00697 dyu 0.22059 dzo 0.90769 0.00142 0.90769 0.00139 0.90769 0.00134 el ell 0.0 0.96063 0.00047 0.0 0.97908 0.0 0.99592 5e-05 0.98755 0.0 0.0006 0.03373 9e-05 0.01141 eml 0.85294 0.00232 0.0289 0.87218 0.00159 0.14052 eng en 0.190060.00189 0.8855 epo ese 0.96825 0.00051 0.18155 0.02593 0.00038 0.00037 0.55455 0.0045 0.00165 0.75 0.00013 0.73118

Table 42: Comparison of GlotLID vs FT176 on UDHR benchmark (part 1)

			CI-4	ID M	ET	176	Cl-4T II	M 0 2			ce threshol		ET17	60.5
				JID-M				D-M θ=.3		D-M θ=.5		6 θ=.3		6 θ=.5
iso639-3	UDHR Code(s)	FT176 Code(s)	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
est	ekk	et	0.60302	0.01017	0.28986	0.01386	0.63492	0.00871	0.7362	0.00526	0.553	0.00446	0.84507	0.00098
eus	eus	eu	0.9313 <b>0.27586</b>	0.00116 0.00373	0.58586	0.00372	0.96825 0.27451	0.00051 0.00215	0.98387 0.22222	0.00024 0.00012	0.95082	0.00014	0.97479	0.0
eve evn	eve evn	-	0.21154	0.00373			0.2029	0.00213	0.03333	0.00012				
ewe	ewe	-	0.98361	0.00026			0.98361	0.00025	0.98361	0.00024				
fao	fao	-	0.98305	0.0			0.98305	0.0	0.98305	0.0				
fas	prs/pes	fa	0.90152	0.00322	0.97959	0.00024	0.90494	0.00303	0.90494	0.00293	0.99174	9e-05	0.99174	9e-05
fat fij	fat fii	-	0.97521 1.0	0.00026			0.97521 1.0	0.00025 0.0	0.97521 1.0	0.00024				
fin	fij fin	fi	0.38415	0.026	0.11397	0.04539	0.39252	0.02462	0.41311	0.02188	0.20228	0.02242	0.28704	0.01369
fkv	fkv		0.28571	0.0			0.28571	0.0	0.23529	0.0				
fon	fon	-	0.94118	0.00051			0.94915	0.00038	0.95726	0.00024				
fra frr	fra	fr frr	0.95238	0.00077 0.00026	0.17831	0.02607 5e-05	0.95935	0.00051 0.00025	<u>0.9661</u>	0.00012 0.00012	0.29412	0.01323	0.40404	0.00789
fry	fry	fy	0.99174	0.00020	0.944	0.00028	1.0	0.00023	1.0	0.00012	0.9916	0.0	0.98305	0.0
fuf	fuf	-,	0.04762	0.00051	0.711	0.00020	0.01613	0.00051	0.0	0.00037	0.7710	0.0	0.70505	0.0
fur	fur	-	0.944	0.00077			0.95935	0.00051	0.96721	0.00037				
fuv	fuv	-	0.77912	0.00245			0.80833	0.00126	<u>0.81197</u>	0.00073				
fvr gaa	fvr gaa		0.93846	0.00103			0.96825	0.00051	0.98387	0.00024				
gag	gag	_	0.93103	0.0			0.93103	0.0	0.93103	0.00024				
gaz	gaz	-	0.83221	0.00322			0.88235	0.00177	0.83761	0.00073				
gjn	gjn	-	0.90476	0.00103			0.93443	0.00051	0.95798	0.00012				
gkp	gkp		0.92063	0.00129	0.57042	0.00272	0.93548	0.00101	0.96667	0.00049	0.7451	0.00120	0.00702	0- 05
gla gld	gla gld	gd	0.94574	0.00026	0.57843	0.00372	0.95312	0.00013	0.96063	0.0	0.7451	0.00138	0.80702	9e-05
gle	gle	ga	0.95	0.00103	0.72258	0.00108	0.96815	0.00063	0.96815	0.00061	0.79433	0.00041	0.80597	0.00018
glg	glg	gl	0.98305	0.00013	0.78832	0.00113	0.98305	0.00013	0.98305	0.00012	0.90756	0.00028	0.94643	0.0
glv	glv	gv	1.0	0.0	0.08571	0.00038	1.0	0.0	1.0	0.0	0.0	5e-05	0.0	0.0
gom	-	gom	0.50640	0.00051	0.5	0.00028	0.60714	0.00025	0.65250	0.00012	0.20222	0 5e 05	0.00	0
grn gsw	gug gsw	gn als	0.59649 0.98333	0.00618 0.00013	0.5 0.85217	0.00057 0.00028	0.60714 <b>0.9916</b>	0.00568	0.65359 0.9916	0.00379	0.30233 0.8785	5e-05 0.0	0.08 0.55422	0.0
guc	guc	-	0.96063	0.00013	0.03217	0.00020	0.96825	0.00051	0.98387	0.00024	0.0100	0.0	0.00722	0.0
guj	guj	gu	1.0	0.0	0.99379	5e-05	1.0	0.0	1.0	0.0	<u>1.0</u>	0.0	1.0	0.0
guk	guk	-												
guu	guu	-	0.52622	0.0			0.52632	0.0	0.44444	0.0				
gyr hat	gyr hat	ht	0.52632 0.90706	0.0 0.00322	0.45128	0.00137	0.52632	0.0 0.00227	0.44444 <b>0.95312</b>	0.0 0.00147	0.1831	0.00032	0.032	4e-05
hau	hau	-	0.94488	0.0027			0.96	0.00189	0.97297	0.00122				.2 05
haw	haw	-	<u>1.0</u>	0.0			1.0	0.0	1.0	0.0				
hbs	hrv/bos/srp/cnr	bs/hr/sh/sr	0.95957	0.00335	0.68431	0.01466	0.97534	0.00177	0.98066	0.0011	0.93048	0.00184	0.73559	0.00058
hea	hea heb	- ho	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
heb hif	1100	he hif	1.0	0.0009	1.0	9e-05	1.0	0.00076	1.0	0.00073	1.0	0.0	1.0	0.0
hil	hil	-	1.0	0.0		, c 05	1.0	0.0	1.0	0.0				•
hin	hin	hi	0.62	0.00978	0.33333	0.01169	0.62312	0.00947	0.62944	0.00892	0.33333	0.0114	0.34066	0.0107
hlt	hlt	-	0.92982	0.0			0.92982	0.0	0.89091	0.0				
hms hna	hms hna	-												
hni	hni	-												
hnj	hnj	-												
hns	hns	-	0.89655	0.00026			0.91228	0.0	0.91228	0.0				
hsb	hsb	hsb	1.0	0.0	0.77064	0.00033	1.0	0.0	1.0	0.0	0.82353	0.0	0.68132	0.0
hun	hun	hu	0.82192 0.98082	0.00335	0.30928	0.01263	0.84507 <b>0.98615</b>	0.00278 0.0	0.89552 0.97479	0.00171	0.57143	0.00414	0.69767	0.00232
hus huu	hus huu	-	0.98082 0.98305	0.00039			0.96552	0.0	0.96552	0.0				
hye	hye	hy	1.0	0.0	0.99281	5e-05	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
ibb	ibb	-												
ibo	ibo		0.98718	0.00026	0.21020	0.00420	0.99355	0.00013	1.0	0.0	0.24224	0.00014	0.00221	0.0
ido idu	ido idu	io	0.95 0.0	0.00013 0.00013	0.21839	0.00438	0.94915 0.0	0.0 0.00013	0.94915	0.0	0.24324	0.00014	0.09231	0.0
iii	iii	_	0.0	0.00013			0.0	0.00013						
ijs	ijs	-												
ike	ike	-	0.97872	0.00026			0.97872	0.00025	0.97872	0.00024				
ile	-	ie	0.01220	0.001.42	0.77465	0.00033	0.000	0.00114	0.07.470	0.00027	0.07245	5e-05	0.04545	0
ilo ina	ilo ina	ilo ia	0.91339 0.86131	0.00142 0.00232	0.77465 0.82569	0.00137 0.00019	0.928	0.00114 0.00139	0.97479 0.944	0.00037 0.00073	0.97345 0.77551	0.0	0.94545 0.28571	0.0
isl	isl	is	0.9916	0.00232	0.74839	0.00179	0.9916	0.000139	0.9916	0.00073	0.77852	0.00147	0.78621	0.00129
ita	ita	it	0.8	0.00373	0.15038	0.03191	0.83916	0.00278	0.86957	0.00208	0.30769	0.01236	0.47967	0.00562
jav	jav	jv	0.97581	0.00051	0.43243	0.0024	0.97581	0.00051	0.97561	0.00037	0.48485	9e-05	0.16418	0.0
jbo jiv	jiv	jbo	0.48583	0.00116 0.01609		0.0017	0.50847	0.00088 0.0144	0.53881	0.00061 0.01198		0.00037		4e-05
jiv jpn	jiv jpn	ja	0.48383	0.01009	0.5	0.01381	0.79245	0.0144	0.79245	0.01198	0.68852	0.00607	0.80109	0.00321
kaa	kaa	-	0.96667	0.00026			0.96667	0.00025	0.97479	0.00012				
kal	kal	-	0.98305	0.0			0.98305	0.0	0.98305	0.0				
kan	kan	kn	1.0	0.0	0.67836	0.00259	1.0	0.0	1.0	0.0	0.99145	5e-05	1.0	0.0
kat kaz	kat kaz	ka kk	0.96721	0.0	1.0 0.39057	0.0 0.00844	1.0 <b>0.97521</b>	0.0 0.00025	1.0 0.96667	0.0 0.00024	1.0 0.40845	0.0 0.00763	1.0 0.42491	0.0 0.00691
kbd	kbd	- KK	0.87692	0.00206	0.57057	0.00044	0.87692	0.00202	0.87692	0.00024	000-0	0.00703	0.72771	0.00091
kbp	kbp	-	0.85714	0.00257			0.90909	0.00152	0.9375	0.00098				
kbr	kbr	-	0.99174	0.00013			1.0	0.0	1.0	0.0				
kde	kde	-	0.58491	0.0			0.58491	0.0	0.54369	0.0				
kdh kea	kdh kea	-	$\frac{0.77551}{0.72727}$	0.0 0.00129			0.76289 0.72727	0.0 0.00126	0.73684 0.69811	0.0 0.0011				
kek	kek	-	0.97521	0.00129			0.72727	0.00126	0.09811	0.0011				
kha	kha	_	0.97521	0.00026			0.98333	0.00013	0.97479	0.00012				
khm	khm	km	1.0	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
kin	kin	-	0.76336	0.0027	0.67707	0.00260	0.81967	0.00152	0.8547	0.00086	0.60767	0.00220	0.01001	0.00125
kir kih	kir kjh	ky	0.95238 0.83099	0.00077 0.00296	0.67797	0.00269	0.95238 0.83099	0.00076 0.0029	0.96774 0.84892	0.00049 0.00244	0.69767	0.00239	0.81081	0.00125
kkh	kkh	-	0.03077	0.00270			0.03033	0.0029	0.04072	0.00244				
kmb	kmb	-	0.99194	0.00013			0.99194	0.00013	0.99194	0.00012				
kmr	kmr	ku	0.66667	0.0076	0.53881	0.00476	0.66667	0.00745	0.66667	0.00721	0.59296	0.00372	0.6	0.0033
knc	knc	-	0.97059	0.00039			0.97778	0.00025	0.97778	0.00024				
kng kom	kng koi	kv	0.0 0.95935	0.00039 0.00064	0.65909	0.0	0.0	0.00013 0.00025	0.0 <b>0.9916</b>	0.00012 0.00012	0.65909	0.0	0.525	0.0
koo	koo	K.V	0.79389	0.00004	0.03707	0.0	0.98333	0.00023	0.79389	0.00012	0.03707	0.0	0.525	0.0
kor	kor	ko	0.95238	0.00077	0.86331	0.0009	0.96774	0.00051	0.99174	0.00012	<u>1.0</u>	0.0	1.0	0.0
kqn	kqn	-	1.0	0.0			1.0	0.0	1.0	0.0				
kqs	kqs		0.20896	0.0		0.00122	0.09524	0.0	0.03279	0.0		0.00**		0.0004
krc kri	- kri	krc	0.96875	0.0		0.00132	0.96875	0.0	0.96063	0.0		0.0011		0.0004
krl	krl	-	0.02581	0.0			0.96873	0.0	0.20003	0.0				
ktu	ktu	-	0.78912	0.00747			0.57944	0.00404	0.54369	0.00367				

Table 43: Comparison of GlotLID vs FT176 on UDHR benchmark (part 2)

							with confidence threshold $\theta$				$\mathbf{d} \; \theta$			
			GlotI	JD-M	FT	176	GlotLII	<b>D-M</b> θ=.3	GlotLII	<b>)-M</b> θ=.5	FT17	6 θ=.3	FT17	'6 θ=.5
iso639-3	UDHR Code(s)	FT176 Code(s)	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
kwi lad	kwi lad		0.837 0.92174	0.0 0.00026			0.78899 0.92174	0.0 0.00025	0.70588 <b>0.92982</b>	0.0 0.00012				
lao	lao	lo	1.0	0.0	0.84932	0.00104	1.0	0.0	1.0	0.0	0.98413	9e-05	1.0	0.0
lat lav	lat lvs	la lv	0.975 0.94118	0.00013 0.00193	0.6568 0.88148	0.00495 0.00146	0.975 0.95618	0.00013 0.00139	0.97071 0.96386	0.00012	0.92174 0.96356	9e-05 0.00037	0.78 <b>0.99167</b>	0.0 4e-05
lez	- lia	lez		0.0		0.00019	0.94643	0.0	0.92727	0.0		0.00014		4e-05
lia lij	lij	-	0.94643 0.49785	0.01493			0.53953	0.01238	0.92727 0.64804	0.00758				
lin lit	lin lit	- lt	0.99145 0.9375	0.00026 0.00103	0.68208	0.00255	1.0 0.96774	0.0	1.0 0.98361	0.0 0.00024	0.97521	9e-05	0.9916	0.0
lld	lld	-	0.53465	0.0018	0.00200		0.5567	0.00126	0.51685	0.00073	0.77521		00510	
lmo lns	- Ins	lmo		0.00991		0.00212		0.00897		0.00733		0.0006		4e-05
lob	lob	-	0.92857	0.00026			0.93694	0.00013	0.93578	0.0				
lot loz	lot loz		0.84892	0.0			0.84892	0.0	0.84892	0.0				
ltz lua	ltz lua	lb	0.98305 0.72414	0.00	0.90435	0.00014	0.98305 0.75	0.0 0.00126	0.98305 <b>0.78846</b>	0.0 0.00037	0.90265	9e-05	0.88889	0.0
lue	lue	-	0.99145	0.0			0.99145	0.0	0.99145	0.0				
lug lun	lug lun	-	0.9589 0.81752	0.00077 0.00039			0.97222 0.8209	0.00051 0.00013	$\frac{0.98592}{0.82707}$	0.00024				
lus mad	lus mad	-	0.94309	0.0009			0.95868 0.92174	0.00063	0.97479 0.89286	0.00037 0.0				
mag	mag		0.75385	0.00051			0.76562	0.00025	0.76562	0.00024				
mah mai	mah mai	- mai	0.96063 <b>0.83099</b>	0.00064	0.06977	0.0	0.83099	0.0	1.0 0.83099	0.0	0.06977	0.0	0.02381	0.0
mal	mal	ml	1.0	0.0	0.9145	0.00108	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
mam mar	mam mar	mr	0.93913 <b>0.99174</b>	0.00026 0.00013	0.98361	9e-05	0.95575 0.99174	0.0	0.94643 0.99174	0.0 0.00012	0.98361	9e-05	0.98361	9e-05
maz	maz med	-	0.83582	0.00219 0.00026			0.85496 0.9916	0.00177	0.896 0.98305	0.00098				
mcd mcf	med mef		1.0	0.0			1.0	0.0	1.0	0.0				
men mfq	men mfq	-	0.9771 0.88722	0.00039 0.00193			0.9771 0.95935	0.00038 0.00063	0.99225 0.9916	0.00012 0.00012				
mhr		mhr		0.00013		5e-05		0.00013	0.5510	0.00012		0		0
mic miq	mic miq	-	$\frac{0.15625}{0.832}$	0.0			0.03333	0.0	0.832	0.0				
mkd	mkd	mk	0.99174	0.0	0.96774	0.00014	0.99174	0.0	0.99174	0.0	0.97561	9e-05	0.99174	0.0
mlg mlt	plt mlt	mg mt	0.94737 0.77419	0.00051 0.00451	0.80342 0.71951	0.00066 0.00212	0.96429 0.78947	0.00025 0.00404	0.97297 0.82759	0.00012 0.00306	0.83673 0.9916	5e-05 0.0	0.76923 0.98305	0.0
mnw mon	mnw khk	- mn	0.88276	0.00206	0.63317	0.00335	0.9771	0.00025	0.98462	0.00012	0.68108	0.00262	0.85714	0.00085
mor	mor	-	0.9916	0.0	0.05517	0.00555	0.9916	0.0	0.9916	0.0	0.00100	0.00202	0.03714	0.00003
mos mri	mos mri	-	0.97015 0.8227	0.00051 0.00026			0.98485 <b>0.82857</b>	0.00025 0.00013	0.99237 0.82857	0.00012 0.00012				
mrj		mrj			0.23222	9e-05			0.01124	0.0044	0.62004	0 00616	0.72222	0 00040
msa mto	min/ind/zlm mto	id/min/ms	0.86842 0.0	0.00785 0.00103	0.23222	0.05256	0.89535 0.0	0.00568 0.00038	0.91124 0.0	0.0044 0.00012	0.63004	0.00616	0.73232	0.00049
mwl mxi	- mxi	mwl		0.00039		0.00019		0.00013		0.00012		5e-05		0
mxv	mxv	-	0.12121	0.0	0.5040	0.00###	0.12121	0.0	0.0625	0.0	0.5010	0.00510	0.5010	0.00584
mya myv	mya -	my myv	0.66667	0.00747	0.5042	0.00556 9e-05	0.66667	0.00732	0.67045	0.00697	0.5042	0.00542	0.5042	0.00526
mzi nah	mzi	- nah				0.00042						9e-05		0
nap		nap				0.00061						5e-05		4e-05
nav nba	nav nba	-	0.9916	0.00013			<u>1.0</u>	0.0	1.0	0.0				
ndo	ndo		0.8806	0.00206	0.92308	0.00019	0.90076	0.00164	0.95161	0.00073	0.93913	9e-05	0.93913	9e-05
nds nep	nds npi	nds ne	1.0 0.99115	0.0	0.92508	0.00019	1.0 0.99115	0.0	1.0 0.99115	0.0	0.96552	0.00014	0.93913	4e-05
nhn nio	nhn nio	- :												
niu	niu	-	1.0	0.0			1.0	0.0	1.0	0.0				
niv njo	niv njo	-	0.95312	0.0			0.95312	0.0	0.95312	0.0				
nku	nku	-1		0.00631	0.39189	0.00844	0.71084	0.00606	0.71515	0.00575	0.77333	0.00152	0.89231	0.00058
nld nno	nld nno	nl nn	0.70659 0.95868	0.00039	0.4	0.00019	0.96667	0.00025	0.9661	0.00012	0.41558	5e-05	0.35616	0.0
nob not	nob not	no	0.98462 <b>0.97391</b>	0.00026	0.53744	0.00481	0.99225 0.97391	0.00013 0.0	0.98438 0.97391	0.00012 0.0	0.63212	0.00312	0.66286	0.00236
nso	nso	-	0.86957	0.00232			0.87591	0.00215	0.88235	0.00196				
nya nym	nya nym	-	0.96414	0.00116			0.97581	0.00076	0.99588	0.00012				
nyn	nyn		0.85938	0.0			0.85938	0.0	0.85938	0.0				
nzi oaa	nzi oaa		1.0	0.0			1.0	0.0	1.0	0.0				
oci ojb	oci ojb	oc	$\frac{0.41101}{0.7027}$	0.0	0.22008	0.00132	0.40516 0.7027	0.0	0.38131 0.66667	0.0	0.17073	0.00078	0.09565	0.00022
oki	oki	-	017027	0.0			0.7027	0.0	0.00007	0.0				
orh oss	orh oss	os	0.50273	0.00785	0.05128	0.0	0.50549	0.00758	0.50829	0.00721	0.02597	0.0	0.0	0.0
ote	ote	-	0.0	0.00425		0.00052	0.0	0.00341	0.0	0.00134				
pam pan	pam pan	pam pa	1.0 1.0	0.0	0.0 1.0	0.00052	1.0 1.0	0.0 0.0	1.0 1.0	0.0	0.0 1.0	0.0	0.0 1.0	0.0
pap pau	pap pau	- :	0.7973 <b>0.97436</b>	0.00386			0.83099 0.97436	0.00303 0.0	0.86765 0.97436	0.0022				
pbb	pbb	-	0.71698	0.00554			0.76056	0.00366	0.816	0.00183				
pcd pcm	pcd pcm		0.71739	0.0			0.71739	0.0	0.71739	0.0				
pfl	-	pfl				0.00014						0		0
pis piu	pis piu		<u>0.9916</u>	0.0			0.9916	0.0	0.9916	0.0				
pms pnb	pnb	pms pnb	0.65969	0.00039 0.00785	0.65625	0.00085	0.65969	0.00038 0.0077	0.65969	0.00012 0.00746	0.66667	0.00014 0.00271	0.65957	0.00263
pol	pol	plib	0.74074	0.00541	0.26966	0.00292	0.76923	0.00455	0.81633	0.0033	0.62176	0.00271	0.7284	0.00192
pon por	pon por	pt	0.86957	0.0 0.00463	0.4829	0.01211	1.0 0.87273	0.0 0.00442	1.0 <b>0.89219</b>	0.0 0.00355	0.71642	0.00437	0.83624	0.0021
pov	pov	- pt	0.96104	0.0	0.7029	0.01211	0.96104	0.0	0.95652	0.0	0.,1042	0.00437	0.03024	0.0021
ppl pus	ppl pbu	ps	0.42105 0.75	0.0	0.98305	0.0	0.20896 0.75	0.0	0.125 0.75	0.0	0.98305	0.0	0.98305	0.0
que	que/qxn/qvh/quh/qvc/qxu/quz/qvn/qug/qwh/qvm/quy/quc/qva	qu	0.92242 <b>0.99174</b>	0.01094 0.00013	0.51086	0.00306	0.93787 0.99174	0.00682 0.00013	0.9491 0.99174	0.00379 0.00012	0.22307	0.00014	0.05846	4e-05
rar rgn	rar rgn	-	0.771/4	0.00013			0.771/4	0.00013	0.771/4	0.00012				

Table 44: Comparison of GlotLID vs FT176 on UDHR benchmark (part 3)

			GlotL	ID-M	FT	176	GlotLII	<b>)-M</b> θ=.3	GlotLII	<b>)-M</b> θ=.5	FT17	6 θ=.3	FT17	6 θ=.5
iso639-3	UDHR Code(s)	FT176 Code(s)	F1↑	FPR↓		FPR↓	F1↑	FPR↓		FPR↓	F1↑	FPR↓	F1↑	FPR↓
rmn	rmn	-	0.86636	0.00013			0.86111	0.00013	0.85047	0.00012				
roh ron	roh ron	rm ro	0.99268 0.81328	0.0 0.00566	0.63764 0.57647	0.00118 0.00674	0.99145 0.80833	0.0 0.00556	0.98775 0.82906	0.0 0.00465	0.29857 0.80992	0.00014 0.00207	0.09217 <b>0.91943</b>	4e-05 0.00067
run	run	-	0.87591	0.00219	0.57047	0.00074	0.88889	0.00330	0.82900 0.90909	0.00147	0.80992	0.00207	0.71743	0.00007
rup	rup	-	0.125	0.0	0.21252	0.02004	0.125	0.0	0.09524	0.0	0.22001	0.01956	0.27072	0.01270
rus sag	rus sag	ru -	0.43478 <b>0.81553</b>	0.02008	0.21352	0.02084	0.47431 0.80392	0.0168	0.51064 0.79208	0.01406	0.22901	0.01856	0.27972	0.01378
sah	sah	sah	0.54128	0.01287	0.62105	0.00339	0.56459	0.01149	0.60513	0.00941	0.63441	0.00312	0.67836	0.00241
san scn	san	sa sen	0.66667	0.0 0.00129	0.58333	5e-05 0.00061	0.66667	0.0	0.66667	0.0	0.58333	5e-05 0	0.51707	0.0
sco	sco	sco	0.92683	0.00051	0.0	0.00042	0.95	0.00013	0.94118	0.00012	0.0	0.0	0.0	0.0
sey shk	sey shk	-	0.02985 0.88889	0.00051			0.0 0.88889	0.00038	0.86792	0.0				
shn	shn	-	0.99145	0.0			0.99145	0.0	0.99145	0.0				
shp	shp	-	0.27397	0.0 0.00154			0.25	0.0	0.14706	0.0				
sid sin	sid sin	si	0.90625 <u>1.0</u>	0.00134	0.99174	5e-05	0.90625 1.0	0.00152 0.0	0.94309 1.0	0.00086	1.0	0.0	1.0	0.0
skr	skr	-												
slk slr	slk slr	sk -	0.88889	0.00193	0.88722	0.00066	0.9375	0.00101	0.94488	0.00086	0.96667	9e-05	0.97479	4e-05
slv	slv	sl	0.92308	0.00129	0.26866	0.01358	0.96	0.00063	0.97561	0.00037	0.72483	0.00161	0.8595	0.0004
sme smo	sme smo	-	0.96667 1.0	0.00026			0.96667 1.0	0.00025	0.96667 1.0	0.00024				
sna	sna	_	0.93846	0.00103			0.96063	0.00063	0.98387	0.00024				
snk	snk	-	0.50010	0.0			0.56010	0.0	0.425	0.0				
snn som	snn som	so	0.56818 0.75817	0.0 0.00476	0.71318	0.00118	0.56818 0.80556	0.0 0.00354	0.425 <b>0.89231</b>	0.0 0.00171	0.29412	0.0	0.0339	0.0
sot	sot	-	0.98333	0.00013			0.9916	0.0	0.9916	0.0				
spa soi	spa als	es	0.75 0.85714	0.00669 0.00257	0.09529 0.3224	0.07429 0.01164	0.76415 0.86131	0.00606 0.00227	0.78 0.89394	0.00477 0.00159	0.24093 0.49789	0.02403 0.00542	0.36281 0.60825	0.01239 0.00334
sqi srd	ais src	sq sc	0.85714	0.00257	0.3224	0.001164	0.93651	0.00088	0.89394 0.97521	0.00024	0.49789	0.00542	0.60825	0.00334
srr	srr	-	0.89231	0.00154			0.93443	0.00063	0.9661	0.00012				
ssw suk	ssw suk	-	0.94891 0.68712	0.00077 0.00605			0.97015 0.69136	0.00038 0.00581	$\frac{0.99237}{0.71895}$	0.0 0.00465				
sun	sun	su	0.9697	0.00039	0.26891	0.0115	0.9771	0.00025	0.9771	0.00024	0.68519	0.00028	0.35443	0.0
sus	sus	-	0.92683	0.00103	0.10546	0.04455	0.94215	0.00076	0.95798	0.00049	0.20221	0.01057	0.40425	0.00212
swa swb	swh swb	sw -	0.85315 0.80292	0.0027 0.00296	0.10546	0.04455	0.86525 0.84615	0.0024 0.00202	0.89051 0.86885	0.00183 0.00122	0.30321	0.01057	0.49425	0.00312
swe	swe	sv	0.88112	0.00219	0.86713	0.00085	0.93333	0.00114	1.0	0.0	0.96875	0.00014	0.98413	4e-05
tah taj	tah taj	-	0.91892 <b>0.66667</b>	0.00013			0.91892 0.66667	0.00013	0.92727	0.0				
tam	tam	ta	1.0	0.0	0.95238	0.00057	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
tat	tat	tt	0.68208	0.00695	0.4055	0.00811	0.68208	0.00682	0.69822	0.00611	0.42754	0.00721	0.50862	0.00504
tbz tca	tbz tca	-	0.20896 0.9916	0.0			0.18182 0.9916	0.0	0.09524 0.9916	0.0				
tdt	tdt	-	0.66292	0.0076			0.66292	0.00745	0.65537	0.00721				
tel tem	tel tem	te	0.97345	0.0	0.9916	5e-05	1.0 0.97345	0.0	1.0 0.94545	0.0	<u>1.0</u>	0.0	1.0	0.0
tet	tet	_	0.57545	0.0			0.77545	0.0	0.74545	0.0				
tgk	tgk	tg	0.86131	0.00245	0.67429	0.00269	0.92913	0.00114	0.95082	0.00061	0.68605	0.00248	0.71951	0.00205
tgl tha	tgl tha	tl th	0.9403 1.0	0.0009	0.09104 0.99574	0.05826 5e-05	0.95455 1.0	0.00063	0.97674 1.0	0.00024	0.49799 <b>1.0</b>	0.00565	0.83562 1.0	0.00094
tir	tir	-	1.0	0.0			1.0	0.0	1.0	0.0				
tiv tly	tiv tly	-	0.98551	0.00026			<u>1.0</u>	0.0	1.0	0.0				
tob	tob		0.98361	0.00026			0.98361	0.00025	0.99174	0.00012				
toi	toi	-	1.0	0.0			1.0	0.0	1.0	0.0				
toj ton	toj ton	-	0.83688 1.0	0.00026			0.83688 1.0	0.00025	0.84892 1.0	0.0				
top	top	-	0.99174	0.00013			0.99174	0.00013	0.99174	0.00012				
tpi tsn	tpi tsn	-	0.98361 0.98361	0.00013 0.00026			0.98361 <b>0.99174</b>	0.00013	0.98361 0.99174	0.00012 0.00012				
tso	tso	_	0.94158	0.0018			0.94158	0.00177	0.95139	0.00134				
tsz	tsz	-	0.82517	0.00309	0.52650	5 05	0.86765	0.00215	0.90625	0.00122	0.52000	0.0	0.47426	0.0
tuk tur	tuk tur	tk tr	0.96748 0.49383	0.00103 0.01583	0.53659 0.19704	5e-05 0.02305	0.96748 0.50209	0.00101 0.01503	0.98347 0.51502	0.00049 0.01381	0.53988 0.29777	0.0 0.013	0.47436 0.35714	0.0 0.00963
twi	twi	-	0.95349	0.00154			0.96094	0.00126	0.9685	0.00098				
tyv tzh	tyv tzh	tyv	0.98361 0.98333	0.00026 0.00026	0.55422	0.0	0.99174 0.98333	0.00013 0.00025	1.0 0.9916	0.0	0.55422	0.0	0.35616	0.0
tzm	tzm	_	0.01754	0.00669			0.01754	0.00657	0.0177	0.00623				
tzo	tzo	-	0.97479	0.00013			0.98305	0.0	0.98305	0.0				
udu uig	udu uig	ug	0.98361 <b>0.91892</b>	0.00026	0.66667	0.0	0.99174 0.91403	0.00013	0.99174 0.89908	0.00012	0.66667	0.0	0.66667	0.0
ukr	ukr	uk	0.98361	0.00026	0.80537	0.00137	0.98361	0.00025	0.99174	0.00012	0.84507	0.00101	0.86957	0.0008
umb ura	umb ura	-	$\frac{0.87931}{0.82963}$	0.00129 0.0			0.87931 0.82963	0.00126 0.0	0.87611 0.82963	0.00086				
urd	urd	ur	0.96522	0.0009	0.70701	0.00429	0.96522	0.00088	0.96522	0.00086	0.92116	0.00083	0.96104	0.00036
uzb vai	uzn	uz	0.70414	0.01274	0.40741	0.00448	0.78033	0.00833	0.86545	0.0044	<u>0.57754</u>	0.0006	0.56977	0.00013
vai vec	vai vec	vec	0.94488	0.0009	0.62385	0.00071	0.95238	0.00076	0.96774	0.00049	0.58427	0.00014	0.35616	0.0
ven	ven	-	1.0	0.0			1.0	0.0	1.0	0.0				
vep vie	vep vie	vep vi	0.66304	0.00013	0.0625 0.58095	9e-05 0.00127	0.66304	0.00013	0.66304	0.00012	0.03279 0.6455	0.0 0.00028	0.03279 <b>0.66667</b>	0.0
vmw	vmw	-	0.95798	0.00013	0.55075		<u>0.97436</u>	0.0	0.97436	0.00012	0.0400		0.00007	
vol war	- war	vo war	0.9916	0.0	0.25993	0.00028 0.00853	0.9916	0.0	0.9916	0.0	0.44872	0.00014 0.0028	0.36364	4e-05 0.00094
war wln	war	war wa	0.62105	0.00914	0.23993	0.00855	0.62434	0.00884	0.64481	0.00782	0.01887	0.0028	0.36364	0.00094
wol	wol	-	0.79747	0.00412			0.86897	0.0024	0.92537	0.0011				
wwa xho	wwa xho	-	0.88636 0.94574	0.0			0.88636 0.96825	0.0 0.00051	0.87356 <u>0.976</u>	0.0 0.00037				
xsm	xsm	-												
yad	yad	-	0.8785 0.97345	0.0 0.00026			0.85714 <b>0.98214</b>	0.0 0.00013	0.75 0.98214	0.0 0.00012				
yao yap	yao yap	-	0.97345	0.00026			0.98214	0.00013	0.98214	0.00012				
yid	ydd	yi	<u>1.0</u>	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
ykg yor	ykg yor	yo	0.85106	0.0027	0.86441	0.00033	0.88889	0.00189	0.93023	0.0011	0.91892	0.0	0.8785	0.0
yrk	yrk	-	0.8381	0.00013			0.83495	0.0	0.69565	0.0		0.0	5.5765	5.0
yua	yua	-	1.0	0.0			1.0	0.0	1.0	0.0				
zam zdj	zam zdj	-	0.0 0.78125	0.00013 0.00245			0.88496	0.00051	0.8972	0.0				
zgh	zgh	-	0.17647	0.0	0.5		0.17647	0.0	0.14925	0.0	0.5	0.5	0.5	0.5
zho zro	wuu/gan/yue/hsn/cmn/hak/cjy/nan zro	wuu/yue/zh	0.71795	0.07248	0.74988	0.02263	0.73346	0.06516	0.75177	0.0566	0.88255	0.00717	<u>0.91715</u>	0.00352
ztu	ztu	-												
zul	zul/nbl	-	0.65591	0.00077			0.66304	0.00051	0.67033	0.00024				
zyb	zyb	-	0.92683	0.00051			0.95	0.00013	0.94915	0.0				

Table 45: Comparison of GlotLID vs FT176 on UDHR benchmark (part 4)

							with confidence threshold $ heta$								
			GlotI	ID-M	Opei	ıLID	GlotLII	<b>D-M</b> θ=.3		)-M θ=.5		ID θ=.3	OpenL	ID θ=.5	
iso639-3	UDHR Code(s)	OpenLID Code(s)	—————————————————————————————————————	FPR↓		FPR↓		FPR↓	F1↑	FPR↓	—————————————————————————————————————	FPR↓		FPR↓	
ace	ace	ace	0.90909	0.00126	0.71856	0.00247	0.91603	0.00107	0.91603	0.00103	0.83916	0.00247	0.88889	0.00075	
afr als	afr als	afr als	0.95238 <b>0.86131</b>	0.00068 0.00205	0.88235 0.32153	0.00086 0.01331	0.96774 0.7377	0.00043 0.00182	0.97561 0.56863	0.00031 0.00134	0.90909 0.38689	0.00086 0.01331	0.96 0.472	0.00027 0.00702	
amh	amh	amh	1.0	0.00203	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.00702	
arb	arb	arb	0.98333	0.00011	0.92437	0.00021	0.92035	0.00011	0.8381	0.0001	0.94017	0.00021	0.94828	5e-05	
ast ayr	ast ayr	ast ayr	0.97521 <b>0.99174</b>	0.00011 0.00011	0.66667 0.75472	0.00317 0.00209	0.97521 0.91071	0.00011	0.98333 0.84615	0.0	0.75472 0.81081	0.00317 0.00209	0.81633 0.89552	0.00139 0.00075	
azb	azb	azb													
azj bam	azj bam	azj bam	0.74306 0.49682	0.00696 0.00662	0.48163 0.19403	0.00354 0.02275	0.15789 0.5098	0.00215 0.0058	0.03008 <b>0.55319</b>	0.00113 0.00433	0.4856 0.20553	0.00354 0.02275	0.4876 0.26	0.00338 0.01543	
ban	ban	ban	0.49082	0.00002	0.79195	0.02273	0.98361	0.0038	0.97521	0.00433	0.83453	0.02273	0.87218	0.0007	
bel	bel	bel	0.98333	0.0	0.34706	0.0118	0.98333	0.0	0.98333	0.0	0.35224	0.0118	0.39333	0.00964	
bem ben	bem ben	bem ben	0.98333 1.0	0.00023	0.40411 0.99213	0.00934 5e-05	0.98333 1.0	0.00021	0.98333 1.0	0.00021 0.0	0.41844 <b>1.0</b>	0.00934 5e-05	0.47581 1.0	0.00696 0.0	
bho	bho	bho	0.78519	0.00034	0.78519	0.00016	0.78519	0.00032	0.77273	0.00021	0.79104	0.00016	0.78195	0.00011	
bod	bod	bod	0.89091 0.18103	0.00011 0.01038	0.7451 0.18841	0.00021 0.00698	0.89091 0.18605	0.00011 0.00805	0.89091 0.14607	0.0001 0.00464	0.7451 0.19403	0.00021 0.00698	0.7451 <b>0.20077</b>	0.00021 0.00605	
bos bug	bos bug	bos bug	0.18103	0.01058	0.76129	0.00098	0.96063	0.00043	0.14007	0.00021	0.19403	0.00098	0.86765	0.0008	
bul	bul	bul	0.96	0.00057	0.9375	0.00043	0.96	0.00054	0.97561	0.00031	0.95238	0.00043	0.95238	0.00032	
cat ceb	cat ceb	cat ceb	0.93023 0.96721	0.00103 0.00046	0.91603 0.58416	0.00059 0.00451	0.95238 0.9916	0.00064 0.00011	$\frac{0.96774}{1.0}$	0.00041	0.92308 0.60825	0.00059 0.00451	0.96 0.64481	0.00027 0.00348	
ces	ces	ces	0.98387	0.0	0.93846	0.00032	0.98387	0.0	0.98387	0.0	0.96063	0.00032	0.976	5e-05	
cjk	cjk	cjk	0.92641	0.00034	0.61995	0.00724	0.92641	0.00032	0.92035	0.0001	0.63014	0.00724	0.66667	0.00563	
ckb crh	ckb crh	ckb crh	0.97561	0.00034	0.82759	0.00134	0.98361	0.00021	0.98361	0.00021	0.86331	0.00134	0.88235	0.00086	
cym	cym	cym	1.0	0.0	0.82667	0.0014	1.0	0.0	1.0	0.0	0.91852	0.0014	0.96124	0.00027	
dan	dan	dan	0.85135	0.00251	0.84932	0.00113	0.91304	0.00129	0.98437	0.00021	0.88571	0.00113	0.96124	0.00021	
deu dyu	deu dyu	deu dyu	0.98745 0.23188	0.00011 0.00719	0.97119 0.05594	0.00027 0.00429	0.98745 0.22059	0.00011 0.00665	0.98745 0.17323	0.0001 0.00587	0.97521 0.05714	0.00027 0.00429	0.98333 0.06452	0.00011 0.00327	
dzo	dzo	dzo	0.90769	0.00126	0.81159	0.00118	0.90769	0.00118	0.90769	0.00113	0.81159	0.00118	0.81159	0.00118	
ell	ell	ell	0.97908	0.0 0.00205	0.43123	0.0	0.97908	0.0	0.97908	0.0	1.0	0.0	1.0 0.50435	0.0	
eng epo	eng epo	eng epo	0.85294 0.96825	0.00203	0.43123	0.0081 0.00365	0.87218 <b>0.976</b>	0.00161 0.00032	0.8855 0.976	0.00134 0.00031	0.46586 0.69767	0.0081 0.00365	0.77419	0.006 0.00182	
est	ekk	est	0.9375	0.00091	0.33803	0.01261	1.0	0.0	1.0	0.0	0.41096	0.01261	0.55556	0.00514	
eus ewe	eus ewe	eus ewe	0.91729 <b>0.98361</b>	0.00126 0.00023	0.16901 0.38462	0.0316 0.0103	0.96825 0.98361	0.00043 0.00021	0.98387 0.98361	0.00021 0.00021	0.22901 0.4	0.0316 0.0103	0.34091 0.43165	0.01238 0.00847	
fao	fao	fao	0.98305	0.00023	0.94309	0.00027	0.98305	0.00021	0.98305	0.00021	0.96667	0.00027	0.98305	0.0	
fij	fij	fij	1.0	0.0	0.9	0.00075	1.0	0.0	1.0	0.0	0.94737	0.00075	0.96923	0.00021	
fin fon	fin fon	fin fon	0.36311 0.94118	0.02522 0.00046	0.20064 0.34627	0.02694 0.0117	0.38769 0.94915	0.02136 0.00032	0.41311 0.95726	0.01844 0.00021	0.23909 0.35692	0.02694 0.0117	0.29717 0.42804	0.01597 0.00825	
fra	fra	fra	0.95238	0.00068	0.95161	0.00027	0.95935	0.00043	0.9661	0.0001	0.96721	0.00027	0.98333	5e-05	
fur	fur fuv	fur fuv	0.944 0.77912	0.00068 0.00217	0.45736 0.52133	0.00746 0.0096	0.95935 0.80833	0.00043 0.00107	0.96721 0.81197	0.00031 0.00062	0.46825 0.57743	0.00746 0.0096	0.5514 0.69401	0.00509 0.00396	
fuv gaz	gaz	gaz	0.83221	0.00217	0.32133	0.02017	0.88235	0.00107	0.83761	0.00062	0.27991	0.02017	0.36364	0.00390	
gla	gla	gla	0.94574	0.00023	0.57416	0.00445	0.95312	0.00011	0.96063	0.0	0.64516	0.00445	0.71429	0.00225	
gle glg	gle glg	gle glg	0.95 <b>0.98305</b>	0.00091 0.00011	0.7037 0.88372	0.00343 0.0007	0.96815 0.98305	0.00054 0.00011	0.96815 0.98305	0.00052 0.0001	0.80423 0.89764	0.00343 0.0007	0.89412 0.91935	0.00096 0.00043	
grn	gug	grn	0.816	0.00023	0.23742	0.01964	0.82927	0.0	0.81967	0.0	0.26281	0.01964	0.30287	0.01355	
guj	guj	guj hat	0.90706	0.0 0.00285	0.41368	0.0 0.01835	1.0 0.9313	0.0 0.00193	1.0 <b>0.95312</b>	0.0 0.00124	1.0 0.45149	0.0 0.01835	1.0 0.51489	0.0 0.01216	
hat hau	hat hau	hau	0.94488	0.00283	0.41308	0.01833	0.9313	0.00193	0.93312	0.00124	0.43149	0.01833	0.78261	0.00536	
heb	heb	heb	0.99145	0.00011	0.99145	5e-05	1.0	0.0	1.0	0.0	0.99145	5e-05	0.99145	5e-05	
hin hrv	hin hrv	hin hrv	0.62 0.60302	0.00867 0.00902	0.6359 0.52252	0.00381 0.00558	0.62312 0.62176	0.00805 0.00784	0.62944 <b>0.69364</b>	0.00752 0.00546	0.6359 0.57426	0.00381 0.00558	0.63918 0.62032	0.00375 0.0037	
hun	hun	hun	0.82192	0.00297	0.56459	0.00338	0.84507	0.00784	0.89552	0.00144	0.71084	0.00338	0.81379	0.0037	
hye	hye	hye	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	
ibo ilo	ibo ilo	ibo ilo	0.98718 0.91339	0.00023 0.00126	0.63115 0.71166	0.00483 0.00252	0.99355 0.928	0.00011 0.00097	1.0 0.97479	0.0	0.66379 0.8227	0.00483 0.00252	0.74038 0.92063	0.00289 0.00054	
ind	ind	ind	0.72483	0.00411	0.68531	0.00188	0.76056	0.00311	0.78261	0.00258	0.71014	0.00188	0.72593	0.00145	
isl ita	isl ita	isl ita	0.9916 0.7947	0.00011 0.00342	0.9916 0.67416	5e-05 0.00306	0.9916 0.83916	0.00011 0.00236	0.9916 <b>0.86957</b>	0.0001 0.00175	0.9916 0.73171	5e-05 0.00306	0.9916 0.78431	5e-05 0.00171	
jav	jav	jav	0.7947 0.97581	0.00342	0.67416	0.00553	0.83916	0.00236	0.97561	0.00175	0.73171	0.00553	0.50213	0.00171	
jpn	jpn	jpn	0.72195	0.01301	0.64745	0.00842	0.7861	0.00848	0.79245	0.00783	0.71921	0.00842	0.77249	0.0045	
kan kat	kan kat	kan kat	$\frac{1.0}{1.0}$	0.0	0.99394	0.0 5e-05	1.0 1.0	0.0	1.0 1.0	0.0	1.0 1.0	0.0 5e-05	1.0 1.0	0.0	
kaz	kaz	kaz	0.96721	0.00034	0.40989	0.00885	0.97521	0.00021	0.96667	0.00021	0.41281	0.00885	0.42336	0.00836	
kbp	kbp	kbp	0.85714	0.00228	0.23438	0.02103	0.90909	0.00129	0.9375	0.00082	0.24048	0.02103	0.26786	0.01757	
kea khk	kea khk	kea khk	$\frac{0.72727}{0.99225}$	0.00114	0.07627 0.5	0.00896 0.00681	0.72727 0.63158	0.00107 0.0	0.69811 0.33333	0.00093	0.08333 0.50593	0.00896 0.00681	0.07254 0.55172	0.00675 0.00552	
khm	khm	khm	1.0	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	
kin kir	kin kir	kin bir	0.76336	0.0024	0.53061	0.00258	0.81967	0.00129	0.8547	0.00072	0.56522	0.00258	0.64463	0.00118	
kir kmb	kir kmb	kir kmb	0.94488 <b>0.99194</b>	0.0008 0.00011	0.35503 0.82034	0.0117 0.00268	0.95238 0.99194	0.00064 0.00011	0.96774 0.99194	0.00041 0.0001	0.35714 0.86738	0.0117 0.00268	0.39216 0.92015	0.00997 0.00096	
kmr	kmr	kmr	0.66667	0.00673	0.61458	0.00397	0.66667	0.00633	0.66667	0.00608	0.63441	0.00397	0.64481	0.00348	
knc	knc	knc	0.97059 <u>0.40789</u>	0.00034	0.5641 0.55172	0.00542 0.00816	0.97778 0.40789	0.00021	0.97778 0.39735	0.00021	0.63768 0.56522	0.00542 0.00816	0.76301 <b>0.56742</b>	0.00214 0.00718	
kon kor	kng kor	kon kor	0.94488	0.0008	0.83333	0.00816	0.40789	0.00054	0.39733 0.99174	0.0001	0.30322	0.00816	0.96774	0.00718	
lao	lao	lao	<u>1.0</u>	0.0	<u>1.0</u>	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	
lij	lij	lij	0.49785	0.01324	0.43446	0.00805	0.53953	0.01052	<u>0.64804</u>	0.00639	0.46032	0.00805	0.53211	0.00541	

Table 46: Comparison of GlotLID vs OpenLID on UDHR benchmark (part 1)

							with confidence threshold $\theta$							
			GlotI	ID-M	Ope	nLID	GlotLII	<b>)-M</b> θ=.3	GlotLIE	<b>D-M</b> θ=.5	OpenL	ID θ=.3	OpenL	ID θ=.5
iso639-3	UDHR Code(s)	OpenLID Code(s)	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
lin lit	lin lit	lin lit	0.99145 0.9375	0.00023	0.93173 0.78146	0.00091 0.00172	1.0 0.96774	0.0	1.0 <b>0.98361</b>	0.0	0.95868 0.90769	0.00091 0.00172	0.98712 0.95161	0.00011
ltz	ltz	ltz	0.9373	0.00091	0.78146	0.00172	0.98774	0.00043	0.98305	0.00021	0.90769	0.00172	0.93161	0.00027
lua	lua	lua	0.71186	0.00183	0.68263	0.00268	0.75	0.00107	0.78846	0.00031	0.72152	0.00268	0.7619	0.00166
lug	lug	lug	0.9589	0.00068	0.4	0.01127	0.97222	0.00043	0.98592	0.00021	0.4375	0.01127	0.49822	0.00755
lus lvs	lus lvs	lus lvs	0.93548 0.94118	0.00091 0.00171	0.28087 0.9375	0.01594 0.00086	0.95868 0.92623	0.00054 0.00118	0.97479 0.90213	0.00031	0.30208 0.97959	0.01594 0.00086	0.31868 0.98361	0.01329 0.00021
mag	mag	mag	0.75385	0.00046	0.76336	0.00021	0.76562	0.00021	0.76562	0.00021	0.76336	0.00021	0.75969	0.00016
mai	mai	mai	0.83099	0.0	0.81944	0.00011	0.83099	0.0	0.83099	0.0	0.81944	0.00011	0.81944	0.00011
mal mar	mal mar	mal mar	1.0 0.99174	0.0	0.99595	5e-05 0.00011	1.0 0.99174	0.0	1.0 0.99174	0.0	0.99595 <b>0.99174</b>	5e-05 0.00011	1.0 0.99174	0.0 5e-05
min	min	min	0.88235	0.00171	0.63492	0.00365	0.91603	0.00117	0.92187	0.00082	0.69767	0.00365	0.74534	0.00214
mkd	mkd	mkd	0.99174	0.0	0.97561	0.00011	0.99174	0.0	0.99174	0.0	0.97561	0.00011	0.98361	5e-05
mlt	mlt	mlt	0.77419	0.00399	0.59	0.00435	0.78947	0.00343	0.82759	0.00258	0.68208	0.00435	0.82517	0.00129 0.00295
mos mri	mos mri	mos mri	0.97015 0.8227	0.00046 0.00023	0.56769 0.26608	0.00531 0.01663	0.98485 <b>0.82857</b>	0.00021 0.00011	0.99237 0.82857	0.0001	0.62201 0.27523	0.00531 0.01663	0.7027 0.2864	0.00293
mya	mya	mya	0.66292	0.00673	0.66667	0.00311	0.66292	0.00633	0.67045	0.00587	0.66667	0.00311	0.66667	0.00311
nld	nld	nld	0.70238	0.00571	0.57843	0.00461	0.71084	0.00515	0.71515	0.00484	0.68208	0.00461	0.77124	0.00188
nno nob	nno nob	nno nob	0.95868 0.98462	0.00034 0.00023	0.912 0.85906	0.00043 0.00113	0.96667 0.99225	0.00021 0.00011	0.9661 0.98438	0.0001	0.92683 0.92754	0.00043 0.00113	0.94215 0.96241	0.00021 0.00027
npi	npi	npi	0.98214	0.00023	0.97345	5e-05	0.575	0.0	0.32353	0.0	0.97345	5e-05	0.97297	0.00027
nso	nso	nso	0.86957	0.00205	0.80537	0.00156	0.87591	0.00182	0.88235	0.00165	0.82759	0.00156	0.83916	0.00123
nya	nya	nya	0.96414	0.00103	0.74462	0.00445	0.97581	0.00064	0.99588	0.0001	0.7707	0.00445	0.86121	0.00209
oci pan	oci pan	oci pan	0.41101 1.0	0.0	0.41187 1.0	0.00118	0.40516 1.0	0.0	0.38131	0.0	0.40773 1.0	0.00118	0.38838	0.00059
pap	pap	pap	0.79195	0.00354	0.35224	0.01164	0.83099	0.00258	0.86765	0.00185	0.41404	0.01164	0.5514	0.00514
pes	pes	pes	0.65922	0.00696	0.62745	0.00247	0.63855	0.0058	0.54135	0.00391	0.63158	0.00247	0.63158	0.00241
plt	plt pol	plt	0.98182 0.74074	0.0 0.00479	0.92308 0.64516	0.00038 0.00354	0.98182 0.76923	0.0	0.98182 <b>0.81633</b>	0.0 0.00278	0.95575 0.68966	0.00038	0.97297 0.76433	5e-05 0.00198
pol por	por	pol por	0.86331	0.00479	0.70588	0.00534	0.87273	0.00376	0.89219	0.00278	0.73171	0.00534	0.7717	0.00138
prs	prs	prs	0.0	0.00274	0.33333	0.00075	0.0	0.00258	0.0	0.00247	0.34483	0.00075	0.34483	0.00059
quy	quy	quy	0.70115 0.80992	0.00593 0.00514	0.10816 0.76078	0.05398 0.00317	0.82993 0.80833	0.00268 0.00472	0.88406 0.82906	0.00165 0.00391	0.11244 0.776	0.05398 0.00317	0.11949 0.79508	0.04817 0.00257
ron run	ron run	ron run	0.88235	0.00314	0.44776	0.00317	0.88889	0.00472	0.90909	0.00391	0.50633	0.00317	0.79308	0.00237
rus	rus	rus	0.43321	0.01792	0.37037	0.01095	0.47431	0.01427	0.51064	0.01185	0.37855	0.01095	0.41522	0.00905
sag	sag	sag	0.81553	0.0	0.65806	0.00231	0.80392	0.0	0.79208	0.0	0.74453	0.00231	0.81356	0.00048
san shn	san shn	san shn	0.66667 0.99145	0.0	0.66376 <b>0.99145</b>	5e-05 0.0	0.66667 0.99145	0.0	0.66667 0.99145	0.0	0.66376 0.99145	5e-05 0.0	0.66376 0.99145	5e-05 0.0
sin	sin	sin	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
slk	slk	slk	0.87591	0.00194	0.68571	0.00295	0.9375	0.00086	0.94488	0.00072	0.75472	0.00295	0.90909	0.00064
slv smo	slv smo	slv smo	0.89552 1.0	0.0016	0.50847 0.84564	0.00622 0.00123	0.95238	0.00064	0.97561 1.0	0.00031	0.65934 0.85135	0.00622 0.00123	0.78947	0.00171
sna	sna	sna	0.93846	0.00091	0.41781	0.00123	0.96063	0.00054	0.98387	0.00021	0.54955	0.00123	0.875 0.7673	0.00098
som	som	som	0.75817	0.00422	0.44106	0.00789	0.80556	0.00301	0.89231	0.00144	0.48333	0.00789	0.59184	0.00429
sot	sot	sot	0.98333	0.00011	0.86667	0.00043	0.9916	0.0	0.9916	0.0	0.87395	0.00043	0.88889	0.00027
spa srd	spa src	spa srd	0.72321 <b>0.9916</b>	0.00685	0.69333	0.00343 0.00376	0.75701 0.9916	0.00537	0.78 0.9916	0.00402	0.72558 0.66667	0.00343 0.00376	0.75362 0.76433	0.00246
srp	srp	srp	0.5124	0.00685	0.48133	0.00338	0.4958	0.00633	0.48945	0.00608	0.48333	0.00338	0.48536	0.00327
SSW	ssw	ssw	0.94891	0.00068	0.72626	0.00258	0.97015	0.00032	0.99237	0.0	0.76923	0.00258	0.89655	0.00075
sun swe	sun swe	sun swe	0.9697 0.86301	0.00034 0.00228	0.52282 0.89362	0.00606	0.9771 0.93333	0.00021 0.00097	0.9771 <b>1.0</b>	0.00021 0.0	0.63317 0.96183	0.00606	0.77301 0.98437	0.00188
swh	swh	swh	0.84956	0.00226	0.1868	0.02694	0.84685	0.00037	0.78	0.0	0.22351	0.02694	0.29517	0.01468
tam	tam	tam	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
tat	tat	tat	0.65556	0.00696	0.40972	0.00907	0.68208	0.0058	0.69822	0.00515	0.42143	0.00907	0.46457	0.00723
tel tgk	tel tgk	tel tgk	0.67429	0.0	0.44106	0.0	1.0 0.92913	0.0 0.00097	1.0 0.95082	0.0 0.00052	1.0 0.45312	0.0	1.0 0.53211	0.00541
tgl	tgl	tgl	0.9403	0.0008	0.58879	0.00467	0.95455	0.00054	0.97674	0.00021	0.61165	0.00467	0.6738	0.00321
tha	tha	tha	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
tir tpi	tir tpi	tir tpi	0.98361	0.0 0.00011	0.47431	0.0 0.00708	1.0 0.98361	0.0 0.00011	1.0 0.98361	0.0	1.0 0.51724	0.0	1.0 0.56338	0.0
tsn	tsn	tsn	0.98361	0.00023	0.85106	0.00113	0.99174	0.00011	0.99174	0.0001	0.90909	0.00113	0.92308	0.00054
tso	tso	tso	0.94158	0.0016	0.63205	0.00875	0.94158	0.0015	0.95139	0.00113	0.64965	0.00875	0.68293	0.00696
tuk tur	tuk tur	tuk tur	0.94821 0.4918	0.00148 0.01415	0.62564 0.34384	0.0008 0.01229	0.96748 0.50209	0.00086 0.01277	$\frac{0.98347}{0.51502}$	0.00041 0.01164	0.65591 0.35928	0.0008 0.01229	0.66667 0.37975	0.00016
twi	tur twi	twi	0.4918	0.01413	0.5234	0.01229	0.30209	0.01277	0.9685	0.00082	0.55034	0.01229	0.60891	0.0103
tzm	tzm	tzm	0.01754	0.00593	0.01653	0.00317	0.01754	0.00558	0.0177	0.00525	0.01653	0.00317	0.01653	0.00316
uig	uig	uig	0.90295	0.00114	0.66667	0.0	0.93333	0.0	0.89908	0.0	0.66667	0.0	0.66667	0.0
ukr umb	ukr umb	ukr umb	0.98361 0.87931	0.00023	0.96 0.85409	0.00027	0.98361 0.87931	0.00021 0.00107	0.99174 0.87611	0.0001	0.96 0.86957	0.00027	0.98361 0.90226	0.00011
urd	urd	urd	0.96522	0.0008	0.61838	0.0073	0.96522	0.00075	0.96522	0.00072	0.62011	0.0073	0.62535	0.00707
uzn	uzn	uzn	0.50407	0.0073	0.18072	0.02597	0.53881	0.00429	0.56716	0.00247	0.21277	0.02597	0.27523	0.01372
vec vie	vec vie	vec vie	0.92308 <b>0.66304</b>	0.00114	0.76923 0.61616	0.00193	0.95238 0.66304	0.00064 0.00011	0.66304	0.00041 0.0001	0.7947 0.62887	0.00193	0.89552 0.63874	0.00075 0.00043
war	war	war	0.9916	0.0	0.90909	0.00064	0.9916	0.00	0.9916	0.0001	0.02887	0.00064	0.94488	0.00043
wol	wol	wol	0.79747	0.00365	0.39117	0.0103	0.86897	0.00204	0.92537	0.00093	0.45756	0.0103	0.56881	0.00498
xho vdd	xho vdd	xho vdd	0.93846 <b>0.99187</b>	0.00091	0.62245 <b>0.99187</b>	0.00397	0.96825	0.00043	<u>0.976</u>	0.00031	0.69714 0.99187	0.00397	0.78205 0.99187	0.00182
yaa yor	yaa yor	yaa yor	0.85106	0.0024	0.33898	0.01256	0.88889	0.00161	0.93023	0.00093	0.99187	0.01256	0.99187	0.00471
zho	cjy/hak/cmn/hsn/yue/gan/wuu/nan	zho/yue	0.96345	0.00011	0.62049	0.04561	0.96408	0.0	0.96408	0.0	0.71366	0.04561	0.8037	0.01645
zul	zul	zul	0.98305	0.0	0.58883	0.00424	0.98305	0.0	0.98305	0.0	0.61053	0.00424	0.65169	0.00321

Table 47: Comparison of GlotLID vs OpenLID on UDHR benchmark (part 2)

GlotLID-M NLLB GlotLID-M  $\theta$ =.3 GlotLID-M  $\theta$ =.5 NLLB  $\theta$ =.3 NLLB  $\theta$ =.5 iso639-3 UDHR Code(s) NLLB Code(s) FPR. F1↑ FPR.L F1↑ FPR. F1↑ FPR. F11 FPR. F11 FPR. F1↑ abk 0.9916 abl 6e-05 0.62434 0.67045 0.93651 ace ace 0.90909 0.00126 0.53153 0.0057 0.91603 0.00107 0.91603 0.00103 0.57005 0.0057 0.0038 ace 0.83495 0.95238 0.0 0.63441 0.90769 0.00375 0.00062 0.83495 0.96774 0.0 0.00043 0.83495 0.0 0.00031 0.65193 0.00375 0.00062 0.00314 0.00039 afr afr 0.97561 0.91473 afr aka fat/twi aka/twi 0.0 0.60884 0.01264 1.0 0.0 0.0 0.65209 0.01264 0.72032 0.00743 0.00182 0.00205 0.7377 0.00134 0.58416 als 0.86131 0.48163 als als alt alt alt 0.95495 0.00034 0.76259 0.00173 0.96364 0.00021 0.96364 0.00021 0.76259 0.00173 0.80303 0.00132 6e-05 0.00431 6e-05 0.00431 amh 0.0 0.88189 0.0 0.0 0.7156 0.0 0.00011 0.60914 0.92035 0.8381 0.76433 0.00088 arb 0.00011 0.0001 0.88235 arb arb arn arn arn 0.93913 0.00011 0.75676 0.00179 0.94737 0.97521 0.0 0.94737 0.0 0.86154 0.00179 0.9322 0.00017 0.98333 0.84615 0.76129 0.76821 0.97521 0.0001 0.57561 0.00475 0.00011 0.0 0.00475 0.00088 0.00011 0.69461 0.00274 0.91071 0.00011 0.00274 0.99174 0.0 0.00083 ayı ayı ayr 0.87218 azb azb azb 0.00696 0.00662 0.03008 **0.55319** 0.97521 0.00113 0.00433 0.74306 0.49682 0.42754 0.20961 0.00542 0.15789 0.5098 0.00215 0.0058 0.45736 0.22857 0.00542 0.01957 0.00385 0.4739 azj azj azj bam bam 0.01957 0.27666 0.01315 bam ban bel 0.98361 0.98333  $\frac{0.82963}{0.88722}$ ban 0.97561 0.00011 0.7044 0.00229 0.0 0.0 0.77241 0.00229 0.00094 0.80272 0.40714 0.81379 0.41455 0.98333 0.98333 bel 0.0 0.00023 0.46914 0.00021 0.00021 bem bem bem 0.00917 0.98333 0.98333 0.00917 0.00699 ben bho 0.0 0.00034 0.992 0.66116 ben bho 1.0 0.78519 0.992 0.0 0.0 0.0 0.0 0.992 0.0 0.66116 0.00011 0.78519 0.00032 0.77273 0.00021 0.00011 0.66116 0.00011 bho bis bis 0.0 0.71006 0.00274 0.0 0.0 0.71856 0.00274  $\frac{0.75949}{0.77922}$ 0.00209 bis 0.00011 0.00425 0.01141 bod bod 0.89091 0.61224 0.00425 0.89091 0.00011 0.89091 0.0001 0.72727 0.00187 0.16456 0.14857 0.14607 0.00464 0.01039 0.00805 0.18103 0.01141 0.18605 0.18056 bos bos bos 0.976 0.97561 0.96774 0.91729 0.97479 0.00055 0.95312 0.00057 0.7439 0.00229 0.96063 0.00043 0.00021 0.82432 0.00229 0.00057 0.00057 0.00103 0.95868 0.49793 0.96 0.95238 0.95868 0.63492 0.00223 0.00017 0.00677 0.00017 0.00054 0.00031 6e-05 0.00149 0.93023 cat cat cat 0.00677 0.00064 0.00041 0.81633 1.0 0.98387 0.86154 ceb ceb ceb 0.96721 0.00046 0.57143 0.00481 0.9916 0.00011 0.0 0.59487 0.00481 0.61702 0.00391 0.98387 0.79487 0.89855 0.82353 0.00173 0.0 0.00173 0.98387 0.0  $0.0 \\ 0.0$ 0.94656 ces ces chv ces chv chv 0.86154 0.0 0.8 0.00028 0.86154 0.0 0.00028 0.83582 0.00011 cjk ckb cjk ckb 0.92641 0.00034 0.56296 0.00951 0.92641 0.00032 0.92035 0.0001 0.57431 0.00951 0.6137 0.00726 0.97561 0.00034 0.9375 0.00045 0.00045 0.98361 0.00021 0.98361 0.00021 0.96 crh crh crh 0.0 0.0 0.00251 0.77215 0.00196 1.0 0.91304 0.0 0.00129 0.0 0.00021 0.82432 0.00196 0.00089 0.87143 0.96825 0.00094 0.85135 cyn cym cym 0.98437 0.00011 0.87143 0.00089 dan dan dan 0.96825 deu dyu dzo  $\begin{array}{c} 0.98745 \\ 0.23188 \\ 0.90769 \end{array}$ deu 0.79208 0.02581 0.00011 0.64 0.00755 0.98745 0.00011 0.98745 0.0001 0.73846 0.00755 0.00347 0.04167 0.00721 0.22059 0.00666 0.17323 0.00587 0.04396 0.00721 0.00126 0.90769 dzo 0.68132 0.0 0.00118 0.90769 0.00113 0.68132 0.0 0.58824 0.0 ell ell ell 0.0 0.98333 0.34188 0.0 0.97908 0.0 0.97908 0.0 0.97479 0.97479 0.0 0.00205 0.00161 0.00134 0.39867 0.46693 eng eng eng epo ekk epo est 0.96825 0.31202 0.00046 0.01504 0.976 0.00032 0.976 0.00031 0.36858 0.01504 0.44203 0.00847 0.9375 0.91729 0.00091 0.00126 0.27778 0.67052 0.0 0.00043 0.00021 0.01745 0.00302 0.43165 0.91339 0.01745 0.3252 0.00869 0.96825 0.98387 0.81119 0.00302 0.00044 eus eus eus ewe ewe ewe 0.98361 0.00023 0.36137 0.01135 0.98361 0.00021 0.98361 0.00021 0.4 0.01135 0.44106 0.00798 6e-05 0.00011 0.98305 0.64444 0.98305 0.98305 0.64444 0.65169 0.0 6e-05 0.976 0.33155 0.48333 0.96825 0.00011 6e-05 fij fii fii 0.36311 0.0 1.0 0.0 0.0 0.96825 0.27434 0.41311 0.95726 0.38769 fin fin 0.02522 0.02259 0.02136 0.01844 0.02259 0.0137 fon fon 0.00046 0.40702 0.00939 0.94915 0.00032 0.41135 0.00939 fra fra fra 0.95238 0.00068 0.58252 0.00481 0.95935 0.00043 0.9661 0.0001 0.6383 0.00481 0.68966 0.00297 fur fuv 0.944 0.77912 0.00068 0.00217 0.78146 0.00179 0.01208 0.95935 0.80833 0.00043 0.00107 0.00031 0.80822 0.53528 0.00179 0.01208 0.92187 0.66066 fur fuv 0.96721 0.81197 0.0005 gaz gla gle 0.88235 0.95312 0.96815 0.49206 0.95238 **0.99338** gaz gla gaz 0.83221 0.00285 0.41892 0.00962 0.0015 0.83761 0.00062 0.43357 0.00962 0.00704 0.94574 0.95 0.00023 0.00091 0.9375 0.00011 0.00078 0.00011 0.00054 0.96063 0.96815 0.9375 0.98684 0.00011 0.00078 0.0 0.00052 gle gle glg grn glg glg grn 0.98305 0.00011 0.65169 0.00341 0.98305 0.00011 0.98305 0.0001 0.76821 0.00341 0.00061 0.00023 0.36765 0.01286 0.53191 0.00363 0.01286 0.82927 0.81967 guj hat guj hat 1.0 0.90706 0.0 0.0 0.0 0.0 1.0 0.0 1.0 0.0 guj hat 1.0 0.68768 0.95312 0.71856 0.93229 0.00285 0.00598 0.00506 0.9313 0.00193 0.00124 0.69971 0.00598 0.94488 0.0024 0.83256 0.00161 0.00397 0.00397 0.96 0.97297 0.00103 0.87745 heb heb heb 0.99145 0.00011 0.0 0.0 0.0 1.0 0.0 1.0 0.0 0.6359 0.62312 0.64583 hin hin 0.00867 0.00397 0.00805 0.62944 0.00752 0.00397 0.64583 0.00374 0.60302 0.51643 0.00902 0.42636 0.00784 0.00546 0.008 0.58511 hrv hrv 0.62176 0.69364 hrv 0.0227 0.0 0.0052 0.46332 0.97778 0.59184 hun hun hun 0.82192 0.00297 0.22814 0.84507 0.00236 0.89552 0.00144 0.3183 0.0227 0.00765 0.0 0.00023 0.97778 0.50877 0.0 0.00011 0.0 0.97778 0.52968 0.0 0.0052 hye ibo 1.0 0.99355 0.0 hye ibo hye ibo 1.0 0.98718 ilo ilo ilo 0.91339 0.00126 0.7651 0.0019 0.928 0.00097 0.97479 0.00031 0.83824 0.0019 0.93443 0.00039 0.00120 0.00411 0.00011 0.397 0.76129 0.00867 0.00207 0.72483 0.00867 0.76056 0.00311 0.78261 0.9916 0.00258 0.53807 0.69799 0.80272 0.00209 ind isl isl isl 0.9916 0.7947 0.00207 0.9916 0.00011 0.0001 0.80272 0.0016 0.86957 0.97561 0.79245 ita 0.00342 0.44195 0.00822 0.83916 0.00236 0.00175 0.52444 0.00822 0.6178 0.00391 0.00046 0.36646 0.00783 0.97581 0.00043 0.00031 0.41696 0.00783 jav 0.97581 0.0038 0.47012 jav jav jpn kal jpn kal 0.72195 0.01301 0.73 0.00593 0.7861 0.00848 0.00783 0.82486 0.00593 0.85373 0.00242 jpn kal 0.98305 0.0 0.76 0.00185 0.98305 0.0 0.98305 0.0 0.83824 0.00185 0.00022 0.0 1.0 1.0 0.42182 kan kan 0.0 0.0 0.0 1.0 0.0 0.0 kan 1.0 1.0 1.0 0.96721 0.85714 kat kat kat 0.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 0.00034 0.00228 0.97521 0.90909 0.96667 **0.9375** 0.00878 0.01683 0.00878 0.00021 0.00021 0.42182 0.00853 kbp kbp kbp 0.27685 0.01683 0.00129 0.00082 0.28019 0.30851 0.0142 0.09 0.73256 0.72727 0.00114 0.08571 0.00789 0.72727 0.00107 0.69811 0.00093 0.00789 0.07527 0.00655 khk 0.99225 0.71591 0.0 0.00268 0.00268 0.63158 0.33333 0.00132 0.82895 0.00022 khm khm khm 0.0 0.96825 0.00022 1.0 1.0 0.0 0.82927 1.0 0.76336 kin kin kin 0.0024 0.82258 0.00073 0.81967 0.00129 0.8547 0.00072 0.00073 0.84298 0.00055 0.95238 0.99194 0.94488 **0.99194** 0.0008 0.57416 0.00498 0.00041 0.58537 0.85926 0.00498 0.00064 kir 0.96774 0.99194  $\frac{0.625}{0.928}$ 0.82562 0.00055 kmb kmb kmb 0.00011 0.00229 0.00011 0.0001 0.00229 kmr **0.66667** 0.97059 0.00673 0.47773 0.50187 0.00721 0.66667 0.00633 0.66667 0.97778 0.00608 0.50862 0.57021 0.00721 0.00744 0.00545 0.00297 0.00034 0.00744 0.00021 0.00021 knc knc knc 0.97778 0.71277 0.45399 0.51064 0.992 kon kor kon 0.40789 0.0 0.00733 0.40789 0.0 0.39735 0.0 0.4486 0.00733 0.43226 0.00671 0.0008 0.00643 0.96 0.00054 0.0001 0.64516 0.00643 0.99174 0.67416 6e-05 6e-05

Table 48: Comparison of GlotLID vs NLLB on UDHR benchmark (part 1)

with confidence threshold  $\boldsymbol{\theta}$ GlotLID-M NLLB GlotLID-M θ=.3 GlotLID-M  $\theta$ =.5 NLLB θ=.3 NLLB θ=.5 UDHR Code(s) NLLB Code(s) F1↑ FPR↓ FPR↓ F1↑ FPR. F1↑ FPR. F1↑ FPR. F1↑ FPR↓ F1↑ 0.49785 0.01324 0.56701 0.00447 0.53953 0.01052 0.64804 0.00639 0.57592 0.00447 0.67485 0.0027 0.96774 0.96774 0.98305 0.75 0.97222 0.99145 0.00023 0.94561 0.00056 0.0 0.96996 0.00056 6e-05 0.68208 0.60733 0.61017 0.37398 0.33238 0.98361 0.98305 0.78846 0.98592 0.97479 0.90213 0.00021 0.0 0.00031 0.00021 0.00031 lit ltz lua 0.00023 0.00091 0.0 0.00183 0.00302 0.00408 0.00352 0.01286 0.00043 0.0 0.00107 0.74684 0.63388 0.63158 0.39205 0.00302 0.00408 0.00352 0.01286 0.00066 0.00292 0.00231 0.9375 0.98305 0.71186 0.9589 0.67836 0.69231 lua lug lus lvs lug lus 0.000680.00043 0.42724 0.01013 0.95868 0.93548 0.00091 0.01303 0.00054 0.33623 0.01303 0.3442 0.01216  $\frac{0.94118}{0.75385}$ 0.00171 0.95582 0.00056 0.92623 0.00118 0.00093 0.97143 0.00056 0.98347 0.00017 mag mai mal mar mag mai mai 0.00036 0.00185 0.00034 0.0 0.00062 0.76562 0.83099 1.0 0.99174 0.00093 0.00021 0.0 0.0 0.0001 0.00036 0.00185 0.00034 0.0 0.00062 0.66216 0.81081 0.975 0.61635 0.80537 0.62821 0.80537 0.00046 0.00021 0.00121 0.0 0.0 0.0 0.00011 0.83099 0.99174 0.88235 1.0 0.99174 0.91603 0.00011 0.23188 0.99174 0.20588 min min min 0.00171 6e-05 0.91603 0.00107 0.92187 0.99174 0.00082 6e-05 0.0 0.22857 0.99174 0.78146 0.75581 0.35913 0.67416 0.57282 0.59184 mkd 0.99174 0.77419 0.0 0.0 0.99174 0.0 0.0 0.0 0.99174 0.0 0.83099 0.78313 0.37061 0.68182 0.58706 mlt mos mri 0.00399 0.00046 0.00023 0.00673 0.00179 0.00235 0.01029 0.00324 0.78947 0.98485 **0.82857** 0.66292 0.00343 0.00021 0.00011 0.00633 0.88722 0.81761 0.40138 0.7362 0.00077 0.00258 0.00179 0.77419 0.97015 0.8227 0.66292 0.9916 0.82759 0.99237 0.82857 0.67045 0.00258 0.0001 0.0001 0.00587 0.00179 0.00235 0.01029 0.00324 0.00077 0.0016 0.00825 0.00237 mos mri mya mya mya nav nld nav nld 0.00011 0.00492 0.71084 0.0 0.00515 0.00492 0.65556 0.00341 nav nld 0.71515 0.00484 0.70238 0.00571 0.00442 0.65909 0.00442 0.0027 0.70238 0.95868 0.98462 **0.98214** 0.86957 0.96414 0.8855 0.96183 0.88189 0.86131 0.79333 0.00442 0.00073 0.00022 0.00078 0.00101 0.00336 0.96667 0.99225 0.575 0.87591 0.97581 nno 0.00034 0.00023 0.0 0.00205 0.00021 0.00011 0.0 0.00182 0.9661 0.98438 0.32353 0.0001 0.0001 0.0 0.00165 0.95082 0.00073 0.00022 0.00078 0.00101 0.97479 0.98438 0.97391 0.91473 nno nob 0.98438 0.96552 0.86765 0.83509 npi nso npi nso npi nso 0.88235 0.99588 0.38131 nya oci nya oci oss pan pap pcm nya oci 0.00103 0.00064 0.0001 0.00336 0.9189 0.00105 0.41101 0.41688 0.0104 0.40516 0.0 0.0 0.45698 0.0104 0.00462 0.41101 0.50273 1.0 0.79195 0.71739 0.65922 0.0104 0.00034 0.0 0.00336 0.00017 0.00341 0.45698 0.74797 1.0 0.7205 **0.84906** 0.65143 0.90756 0.00462 0.0 0.00 0.00132 0.00011 0.00325 oss pan pap pcm 0.00696 0.71875 0.50549 0.00644 0.50829 0.00608 0.00034 0.7541 1.0 0.83099 0.71739 0.63855 0.00044 0.00 0.00258 0.0 0.0058 0.0 0.00336 0.00017 0.00341 0.0 0.00354 0.0 0.00696 0.0 0.00185 1.0 0.65537 0.84112 0.64407 1.0 0.8227 0.84906 0.65143 0.86765 pen 0.71739 0.54135  $0.0 \\ 0.00392$ pes plt pol pes plt pes plt pol por prs 0.98182 0.74074 0.0 0.00479 0.88525 0.00067 0.98182 0.0 0.98182 0.0 0.00278 0.00067 0.93913 0.00028 0.00386 0.41404 0.00928 0.76923 0.81633 0.4856 0.00928 0.00418 0.41404 0.73171 0.08824 0.09147 0.97515 0.81667 0.00479 0.00434 0.00274 0.00593 0.00492 0.00022 0.06543 0.00112 0.87273 0.0 0.82993 0.99145 0.00376 0.00258 0.00268 0.89219 0.0 0.88406 0.98775 0.00278 0.00299 0.00247 0.00165 0.81081 0.08824 0.09992 0.00492 0.00022 0.06543 0.00112 0.84806 0.08955 0.11018 0.00237 0.00017 0.05233 por 0.86331 0.70115 quy roh 0.99268 0.80992 0.0 0.00514 0.0 0.00472 0.0 0.00392 0.98095 0.85965 ron 0.0024 0.80833 0.82906 0.83051 0.0024 0.00171 0.88235 0.00183 0.71951 0.00252 0.88889 0.00161 0.90909 0.00124 0.75159 0.00252 0.00138 0.00252 0.00878 0.00084 0.00017 0.0 0.0 rus sag san shn 0.47431 0.80392 0.66667 0.99145 0.01428 0.0 0.0 0.51064 0.79208 0.66667 0.99145 0.00124 0.01185 0.0 0.0 0.45455 0.225 0.67249 0.00232 0.00878 0.00084 0.00017 rus sag san shn 0.43321 0.01792 0.43321 0.21176 0.00463 0.81553 0.67521 0.66667 0.99145 san shn 1.0 1.0 0.85926 sin slk sin slk sin slk 1.0 0.9375 0.0 0.87591 0.00095 0.00194 0.00086 0.94488 0.00072 0.89231 0.00095 0.93548 0.00033 0.00095 0.00274 0.00296 0.00716 0.00531 0.00162 0.01387 0.85714 0.76433 0.69461 0.7451 0.78333 slv smo sna 0.78947 0.70175 0.57711 0.61957 slv smo sna som sot 0.89552 0.0016 0.71006 0.95238 0.00064 0.97561 1.0 0.00031 0.00274 0.0011 0.71006 0.68182 0.46964 0.54286 0.69118 0.39709 0.89552 1.0 0.93846 0.75817 0.98333 0.72321 0.0016 0.00 0.00091 0.00422 0.00011 0.00064 0.00054 0.00301 0.00274 0.00296 0.00716 0.00531 0.0011 0.00187 0.00264 0.00209 0.96063 0.80556 0.00021 0.00144 som 0.9916 0.75701 0.0 0.00537 0.72868 0.00162 0.00072 0.00402 spa src srp ssw sun swe swh tah spa srd srp ssw sun 0.00685 0.78 0.9916 0.43968 0.01387 0.5192 0.00814 0.75701 0.9916 0.4958 0.97015 <u>0.9771</u> 0.93333 0.72321 0.9916 0.5124 0.94891 0.9697 0.86301 0.84956 0.00537 0.0 0.00633 0.00032 0.00021 0.00097 0.31923 0.97479 0.49153 0.90769 0.9078 0.98413 0.35821 6e-05 0.00319 0.00028 0.00066 0.86567 0.00089 0.0 0.95082 0.00089 0.95082 0.48945 0.86131 0.84211 0.95385 0.29268 0.00685 0.00068 0.00034 0.00228 0.80307 0.48739 0.80272 0.75294 0.81579 0.00336 0.00123 0.00229 0.00151 0.00608 0.0 0.00021 0.0 0.00336 0.00123 0.00229 0.00151 srp ssw sun 4894 0.99237 0.9771 swe swh 6e-05 0.01178 0.84685 0.78 0.00046 0.24742 0.02036 0.00032 0.0 0.02036 tah 0.91892 0.00011 0.89922 0.00067 0.91892 0.00011 0.92727 0.0 0.92063 0.00067 0.98305 6e-05 1.0 0.65556 0.00067 0.0 0.00755 0.0 0.00727 0.00587 tam tat tel tgk tgl tha 1.0 0.46457 tam tat tel tgk tgl tha 0.00696 0.0 0.00651 0.68208 1.0 0.92913 0.95455 0.0058 0.0 0.00097 0.00515 0.0 0.00052 0.00021 0.46825 1.0 0.50213 0.54148 0.00755 0.0 0.00727 0.00587 0.00693 0.0 0.00446 0.48163 1.0 0.47581 0.5368 0.67429 0.95082 0.97674 tgk tgl tha 0.59296 0.56364 0.9403 0.0008 0.00054 0.00517  $\frac{1.0}{1.0}$ 1.0 0.97561 0.0 0.0 1.0 0.0 0.0 0.0 tir ton tpi tsn tso tuk 0.00017 1.0 0.0 0.0 0.99174 0.00017 tir ton tpi tsn 1.0 1.0 0.98361 0.99174 **0.95139 0.98347** 1.0 1.0 0.98361 **0.99174** 0.0 0.00011 0.00023 0.0016 0.0 0.00011 0.00011 0.0015 1.0 0.98361 0.98361 0.94158 0.91339 0.79452 0.64073 0.00045 0.00157 0.00878 0.0001 0.0001 0.00113 0.00041 0.94309 0.85926 0.66986 0.65574 0.00045 0.00157 0.00878 0.00011 0.00061 0.00633 0.95868 0.89922 tso tuk tso tuk 0.94158 0.967480.70886 0.94821 0.00148 0.65574 0.32967 0.00022 0.00086 0.00022 0.00022 0.98347 0.51502 0.0177 0.89908 0.99174 0.87611 0.96522 0.65574 0.39604 0.01653 0.66667 0.97479 0.63068 tur tzm uig ukr 0.01365 0.0033 0.0 0.0005 0.4918 0.01415 0.50209 0.01277 0.00558 0.01164 0.00525 0.37037 0.01365 0.01007 0.4918 0.01754 0.90295 0.98361 0.87931 **0.96522** tur tzm uig ukr 0.00593 0.00114 0.00023 0.00114 0.57057 0.01653 0.66667 0.94309 0.91051 0.0033 0.0005 0.01653 0.01754 0.00325 0.01734 0.93333 0.98361 0.87931 0.96522 0.00323 0.00 0.0001 0.00072 0.00072 0.0 0.00021 0.00107 0.0014 0.00761 0.0014 0.00761 0.00055 umb umb 0.89313 urd urd 0.0008 0.61838 0.00075 0.63068 0.0071 0.56716 0.96774 0.66304 0.9916 0.41404 0.90909 0.61307 0.81379 0.0073 0.28365 0.01325 0.53881 0.00429 0.00247 0.33908 0.01325 0.00583 0.85714 0.45675 0.75159 0.23985 0.00112 0.00565 0.00213 0.02192 0.00429 0.00064 0.00011 0.0 0.00204 0.00112 0.00565 0.00213 0.02192 0.9230 0.00114 0.95239 0.87591 0.00066 0.00114 0.00011 0.0 0.00365 0.95238 0.66304 0.9916 0.86897 0.00041 0.0001 0.0 0.00093 0.87591 0.56621 0.78146 0.2684 0.92308 0.66304 0.9916 0.79747 0.93846 0.00088 war war wol 0.92537 wol xho 0.33973 0.74214 0.01321 0.00215xho xho 0.00091 0.64835 0.00347 0.96825 0.00043 0.976 0.00031 0.68605 0.00347 ydd yor zho zul 0.99187 0.85106 0.96345 **0.98305** ydd ydd 0.0 0.0 0.0 0.0 1.0 0.44697 0.00811 0.05559 0.00431 0.93023 0.96408 0.98305 yor zho 0.0024 0.88889 0.00161 0.00093 0.50213 0.00811 0.00363 0.54715 0.59487 0.0024 0.96408 0.98305 cjy/hak/cmn/hsn/yue/gan/wu 0.05559 0.02179 0.64088

Table 49: Comparison of GlotLID vs NLLB on UDHR benchmark (part 2)