GlotLID: Language Identification for Low-Resource Languages

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Introduction

GlotLID

We introduce GlotLID, a **language identification** (LID) model that

(i) is open-source.
(ii) covers a wide range of languages, more than **1600 languages.**
(iii) is rigorously evaluated and reliable.
(iv) is efficient and easy to use.

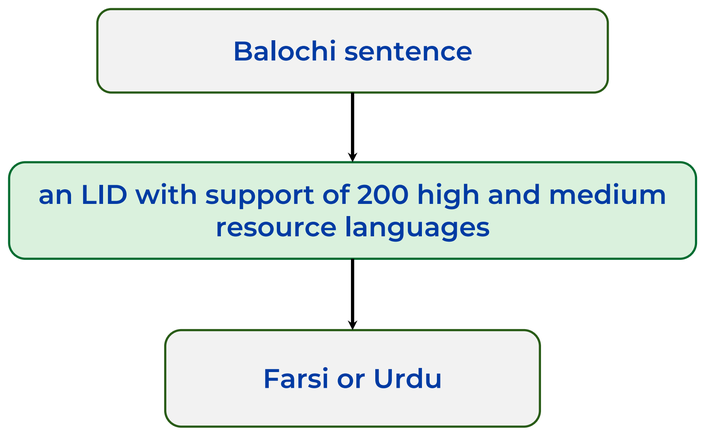
https://github.com/cisnlp/GlotLID

https://huggingface.co/spaces/cis-lmu/glotlid-space

Background and Methodology

LID models in general don't have an ability to say they don't know a language.

LID should support a **broad coverage of languages** to minimize out-of model cousin errors.



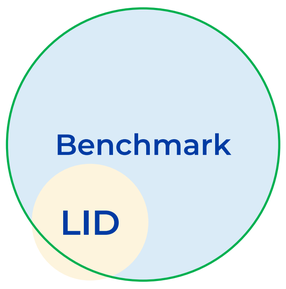
Model:
- We choose FastText model as the GlotLID architecture.
  - scalable, open-source, ease of use, efficient, provide confidence thresholds

Training Data:
- We only use sources we deem trustworthy for GlotLID training.
  - Wikipedia, religious texts, collaborative translations, academia, storybooks, and news sites.
  - This gives us a coverage of 1832 languages, more than any other public LID

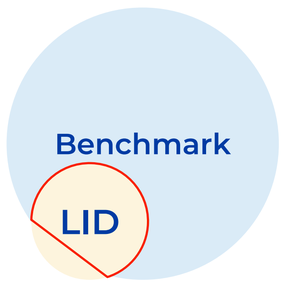
Evaluation Data:
- Flores-200
- UDHR (Universal Declaration of Human Rights)
- Our test set

Comparison Results of GlotLID with Off-the-shelf LIDs

			FLORES-200								UDHR							
			CLD3		FT176		OpenLID		NLLB		CLD3		FT176		OpenLID		NLLB	
			$\|L\|=96$		$\|L\|=108$		$\|L\|=195$		$\|L\|=188$		$\|L\|=100$		$\|L\|=124$		$\|L\|=159$		$\|L\|=172$	
	LID Model	θ	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓	F1↑	FPR↓
SET?	baselines	.0	.753	.0098	.775	.0090	.923	.0051	.947	.0053	.544	.0099	.566	.0079	.645	.0056	.641	.0051
SET?	baselines	θ_1	.779	.0081	.816	.0033	.923	.0050	.948	.0051	.576	.0081	.644	.0025	.676	.0046	.677	.0040
SET?	baselines	θ_2	.799	.0060	.796	**.0021**	**.923**	.0044	**.947**	.0047	.618	.0060	.647	**.0014**	.718	.0034	.717	.0030
SET?	GlotLID-M	.0	.978	.0051	.987	.0042	.916	.0043	**.947**	.0035	.868	.0033	.868	.0030	**.848**	.0020	**.847**	.0019
SET?	GlotLID-M	.3	.980	.0042	.987	.0037	.898	.0020	.927	.0019	.881	.0028	.879	.0026	.846	.0015	.844	.0015
SET?	GlotLID-M	.5	**.980**	**.0031**	**.987**	.0029	.886	**.0014**	.916	**.0013**	**.903**	**.0023**	**.890**	.0021	.847	**.0012**	.846	**.0011**
SET!	baselines	.0	.952	**.0104**	.881	**.0093**	**.923**	**.0051**	.950	**.0053**	.922	.0101	.739	**.0081**	.881	**.0063**	.854	**.0058**
SET!	GlotLID-M	.0	**.983**	**.0104**	**.991**	**.0093**	.922	**.0051**	**.954**	**.0053**	**.952**	**.0100**	**.927**	**.0081**	**.926**	.0064	**.925**	.0060



SET?: Benchmark is not known. Apply LID on the whole benchmark.



SET!: Benchmark is known. Apply LID on the intersection of LID supported languages and benchmark.

Θ is the confidence threshold. If the confidence score for a predicted label falls below the threshold, the model should label the input text as "undetermined".

Contact Us

https://arxiv.org/abs/2310.16248

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