

# Accuracy Improvement of Spoken Language Identification System for Close-Related Languages

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## Abstract

Spoken Language Identification (SLI) systems have witnessed tremendous progress in adopting deep learning architectures. However, differentiating between acoustically and phonetically similar languages remains a significant challenge. This paper investigates the challenges of building SLI systems for similar languages and presents an accuracy improvement strategy. We provide experimental results on a set of closely related languages (Swedish-Norwegian, Czech-Slovak, Ukrainian-Russian, and Spanish-Catalan-Galician) and discuss the implications of our findings. This paper aims to research data impact on SLI models' accuracy, primarily focusing on comparing models trained on different datasets, data quality versus quantity comparison, and data balance demand to achieve the best possible SLI model. Experiments lead us to conclusions that the most impactful criteria on additional accuracy are region-specific SLI models (outperform heavy multilingual by 2.47% on average and much faster to train), adding new domain dataset (improvements for a new domain without significant risk to the original domain accuracy), balancing training data for the same amount of data per each language (provides stability in trained pairs/triples), and adding less but more quality data (30% high-quality data gives more accuracy than 100% of mid-quality data). © The Author(s), under exclusive license to Springer Nature Switzerland AG

## Author keywords

Common Voice; Language identification; LID; SLI; SLR; Spoken Language Identification; Spoken Language Recognition; VoxLingua107

## About this paper

[https://link.springer.com/chapter/10.1007/978-3-031-84228-3\\_4](https://link.springer.com/chapter/10.1007/978-3-031-84228-3_4)

**ISSN:** 2367-4512

**DOI:** 10.1007/978-3-031-84228-3\_4

**EID:** 2-s2.0-105002775622

**Source Type:** Book Series

**Document Type:** Book Chapter

**Publisher:** Springer, Cham