Continuous Training: Data Validation

MLOps: Continuous Training

Dataset Sources

- **2,618** volunteers
  - consented to have their voices redistributed
  - Variety of accents
- > 1,000 examples for **each** keyword
- Started with **automated tools**
  - Remove low volume recordings
  - Extract loudest 1s (from 1.5sec examples)
- All 105,829 remaining utterances **manually reviewed** through crowdsourcing

Speech Commands: A Dataset for Limited-Vocabulary Speech Recognition

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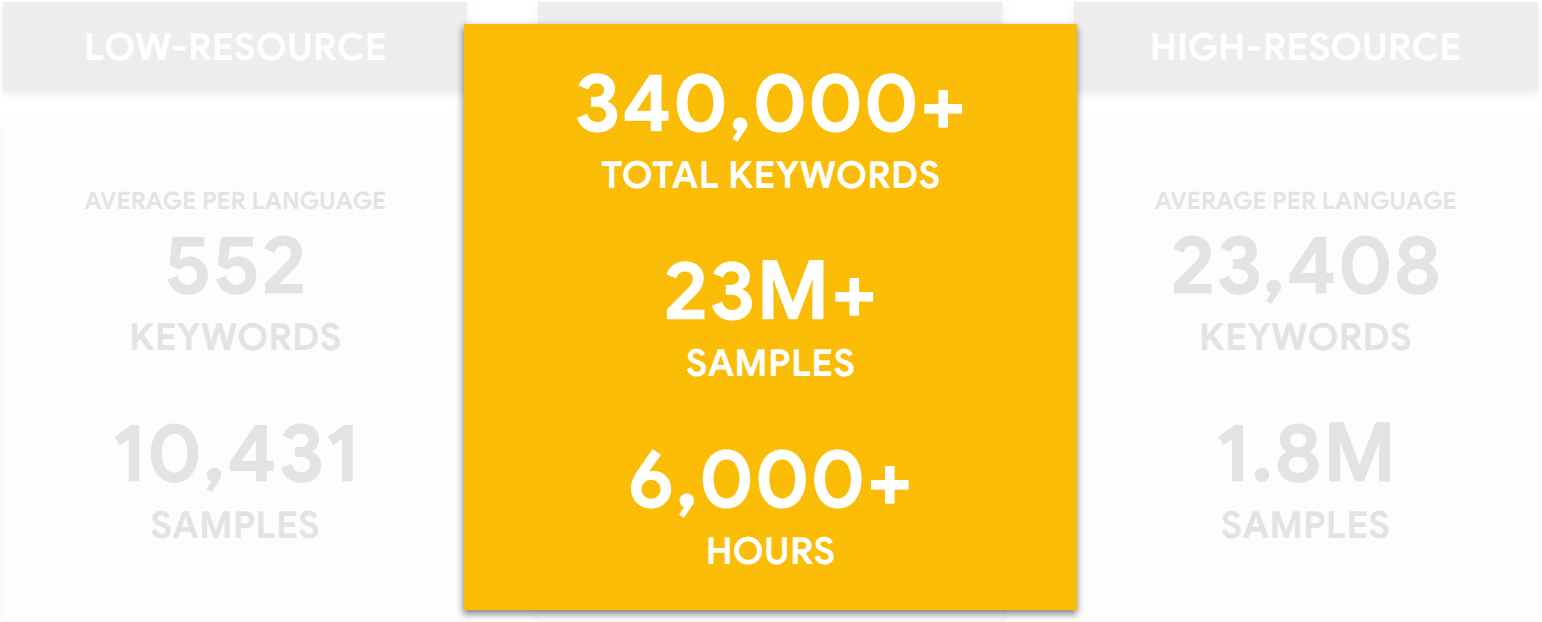
Keywords per language



Validating the MSWC Samples

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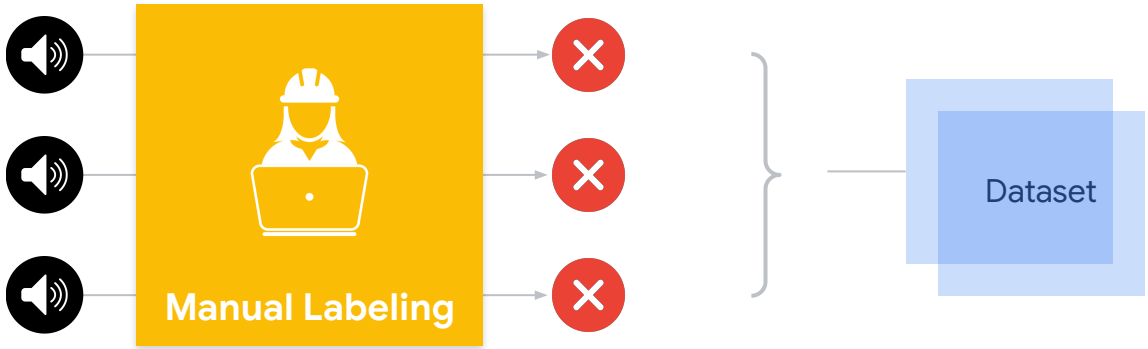

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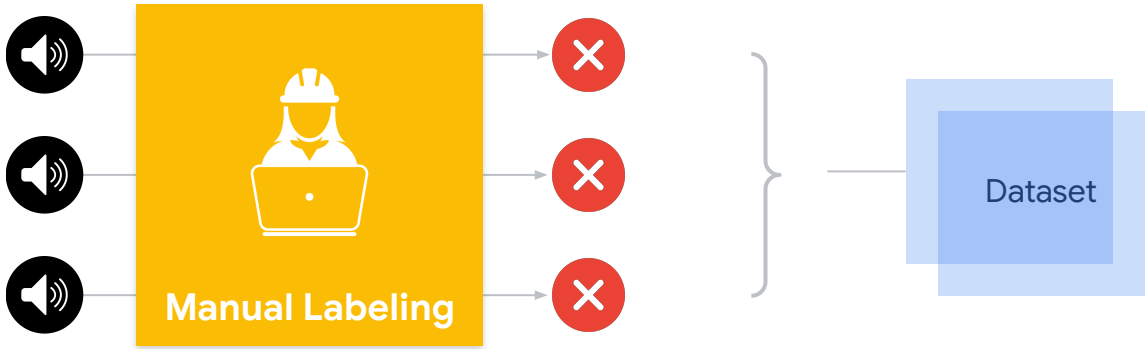

Manual validation is infeasible for all 350,000 keywords and 6,000+ hours of data

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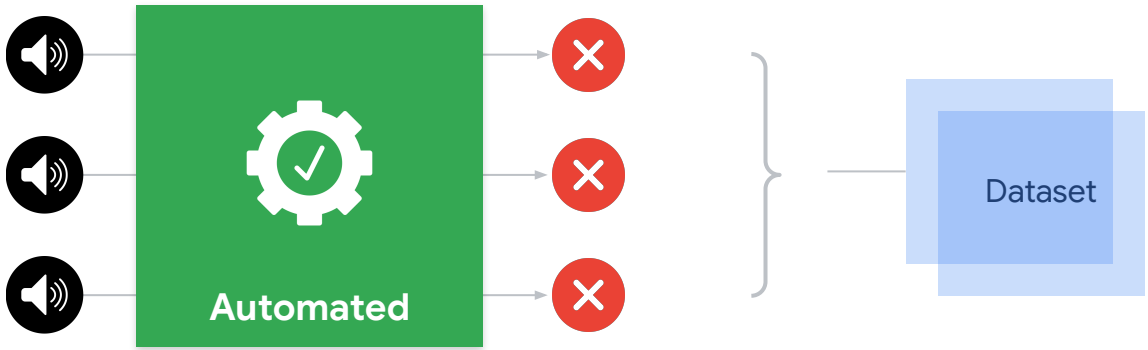
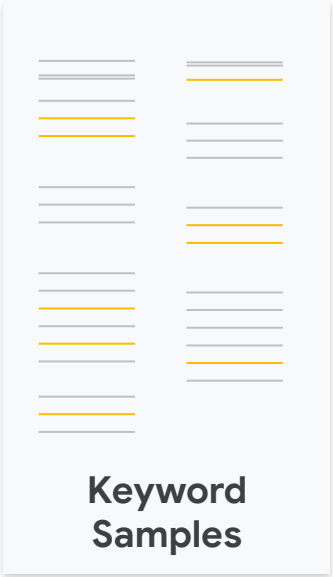


Self-supervised **nearest-neighbor** anomaly detection

- Filters **outliers** by distance
- User **tunable** threshold



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NEAREST 50 CLIPS

CLIP ERROR RATE
2.9%

FARTHEST 50 CLIPS

CLIP ERROR RATE
23.5%

BY DISTANCE TO CLUSTER CENTER

Continuous Validation

In a continuous training pipeline:

- **Same criteria** or new and old data?
  - “Validation drift” can happen as a result of changes in personnel
- Concept drift
  - previously validated samples can become invalid
  - old data should be revisited on occasion