
KWÄN DÉK'ÁN' DO
TO KEEP THE FIRE BURNING

AI Translation Supporting Northern Tutchone Language Revitalization and Strengthening Cultural Roots

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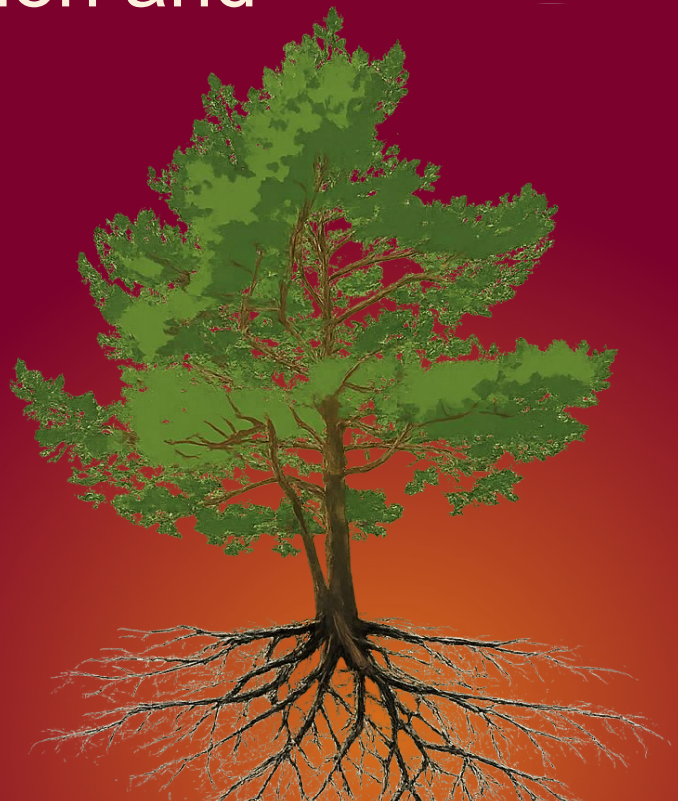
25 February 2025



Translation is constrained by data scarcity, model coverage, and governance requirements

Decline of Living Fluent Speakers + Data Scarcity

Living fluent speakers are rapidly disappearing, and there is a lack of recorded language.

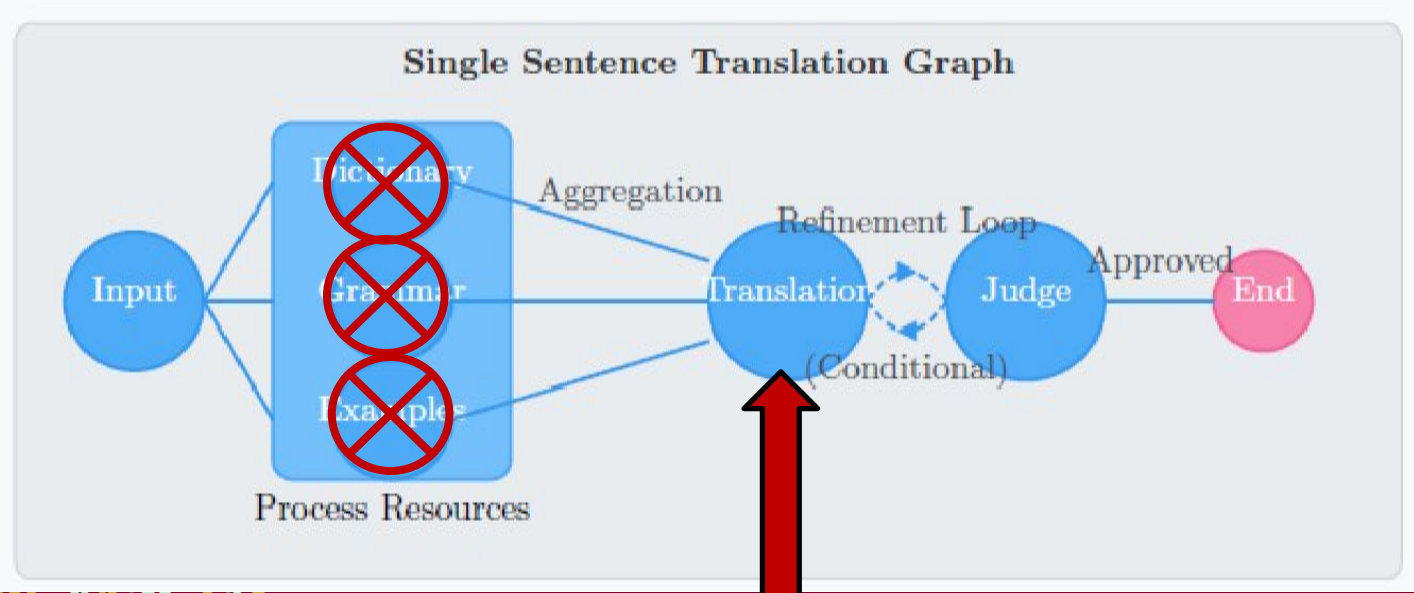
No coverage in Major LLM's or Translation Models

Major large language models lack coverage of the language.

Data Governance & Safety Constraints

Data governance constraints are required for respectful data handling and safety.

A prompt-based approach was useful, but it could not scale into a reliable translator



Open source model

Fine-tuned language models can make translation feasible for very low-resource languages

ByT5

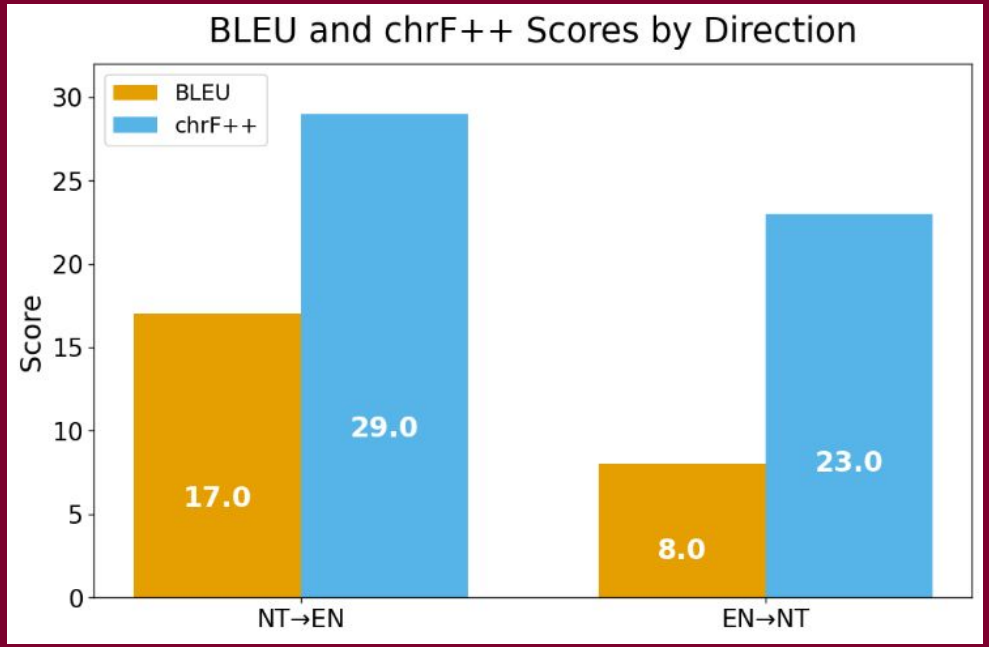
- Byte-level tokenization
- Robust to any language
- Fine-tuneable
- Train/Run locally on consumer hardware

mT5

- Subword tokenization
- Strong cross-lingual priors
- Fine-tuneable
- Train/Run locally on consumer hardware

Current ByT5-small (LoRA) baseline & results

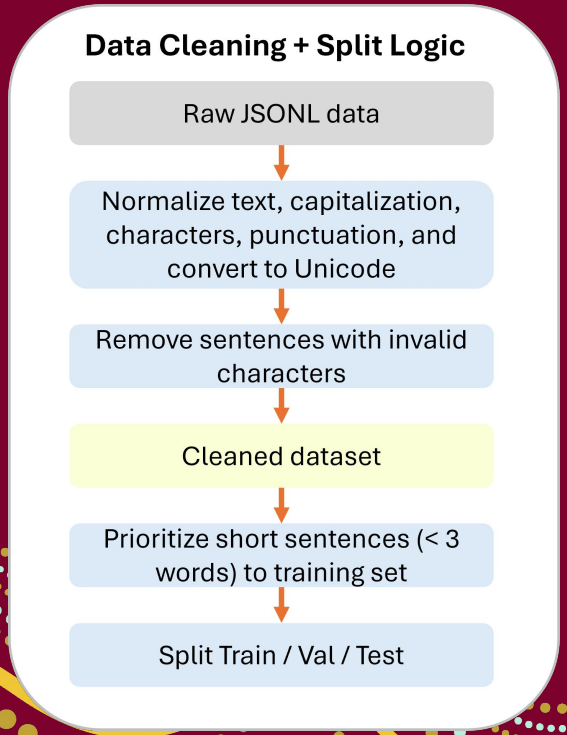
- **~1.8k sentence pairs** post-cleaning (from ~3000 original)
- 3% perfect translations (NT □ EN, val set)

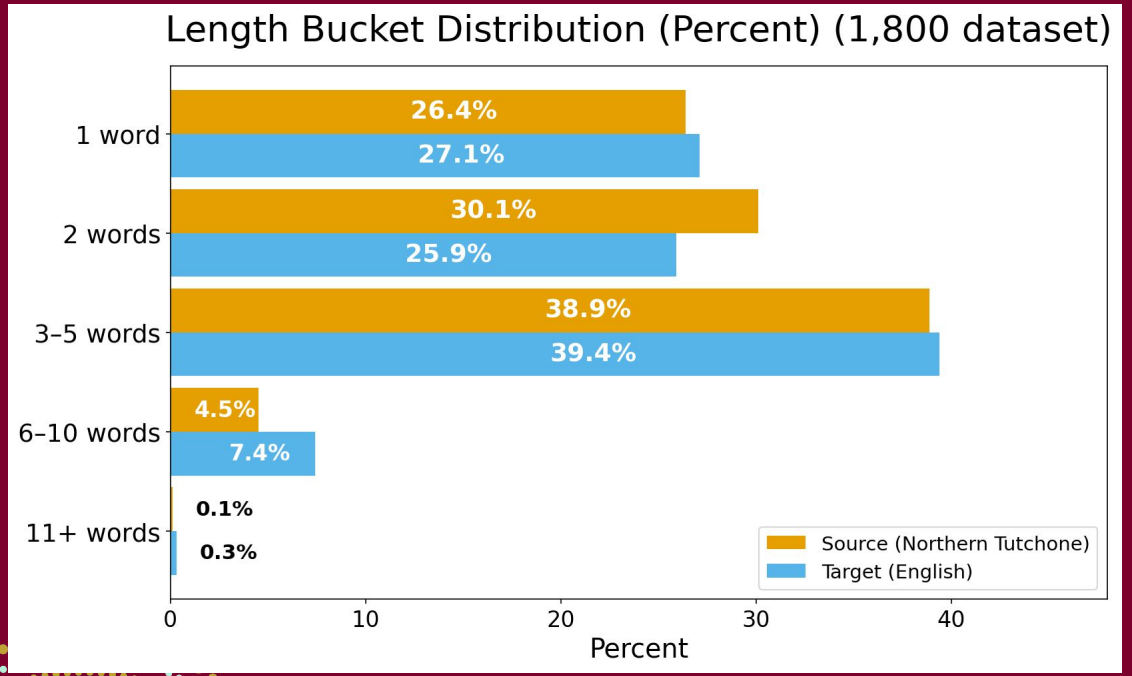


Current ByT5-small (LoRA) baseline & results

	NT Sentence	Reference/Actual Translation	Predicted Translation
1	Tedhaw nenínthyáw.	Warm up the soup .	She is wearing a warm jacket .
2	Dànálát tíhìnchín !	Take our boat out of the water !	Take your boat out of the water !
3	Dek'ą́ą łądézhe.	The boy is going hunting.	The boy is going hunting.

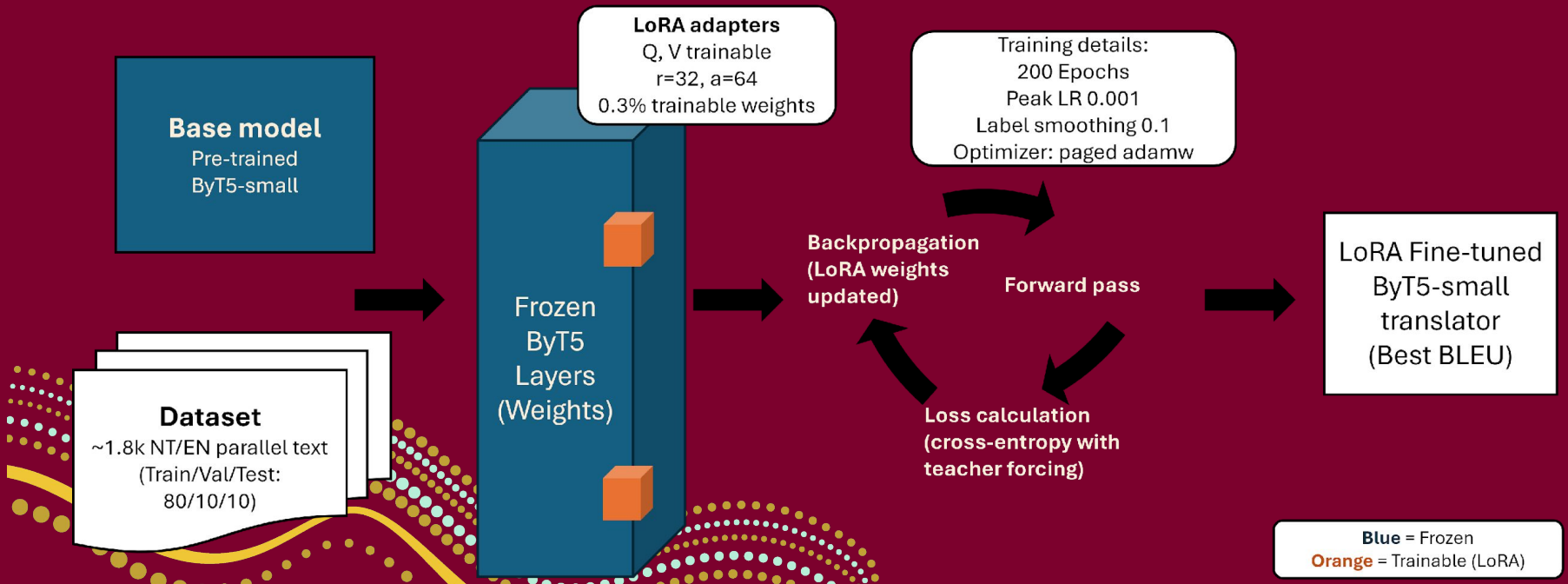
Data preparation, preprocessing and evaluation pipeline





Architecture and training process

1. Data Input → 2. Solution Design (LoRA fine-tuning) → 3. Training Process (Fine-Tuning Loop) → 4. Output & Evaluation



Ethical considerations

Data Governance & Community Focus

- Consent & stewardship
- OCAP adherence

Accuracy & Safety

- Hallucination risks
- Safe usage

Environmental Footprint

- Small, local model
- Very low energy usage

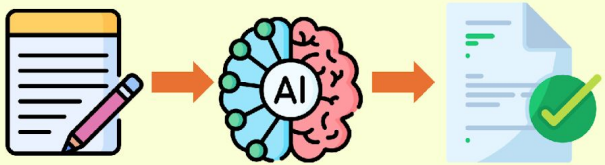
Where the project is going

Baseline Improvement
- Train on new data
- Parameter tuning
- mT5 experiments

Data Growth
- Data augmentation
- Data generation

Community Integration
- Humans-in-the-loop

Language Learning Tool



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