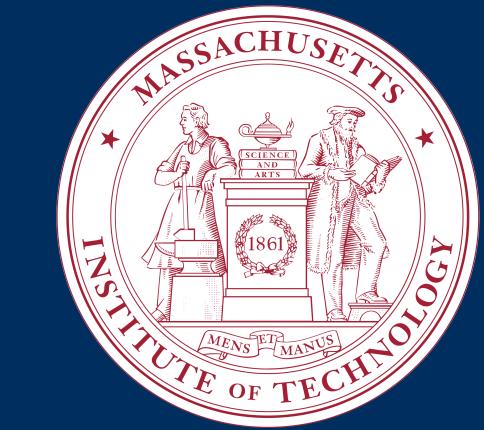


THE BIBLE IS ALL YOU NEED: TRANSLATING THE BIBLE USING TRANSFORMERS

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Abstract

- The Bible is widely considered to be the most read book existing. The original Bible, which is written in Biblical Hebrew is very hard to read and perhaps even uninterpretable by most Hebrew speakers nowadays.
- In this work we propose machine translation models between Biblical Hebrew and Modern Hebrew in order to shed more light on ancient texts and make them more accessible.

Models

- Seq2Seq model with attention (Google's Attention Is All You Need)
- Fine-tuned pretrained Hebrew-to-Hebrew model (Facebook's multi-lingual model)
- Seq2Seq model with a copy mechanism.

Language Difference

- We compared the raw difference between Biblical Hebrew and Modern Hebrew via two metrics: BLEU score as decimal and cosine distance between pretrained embeddings.

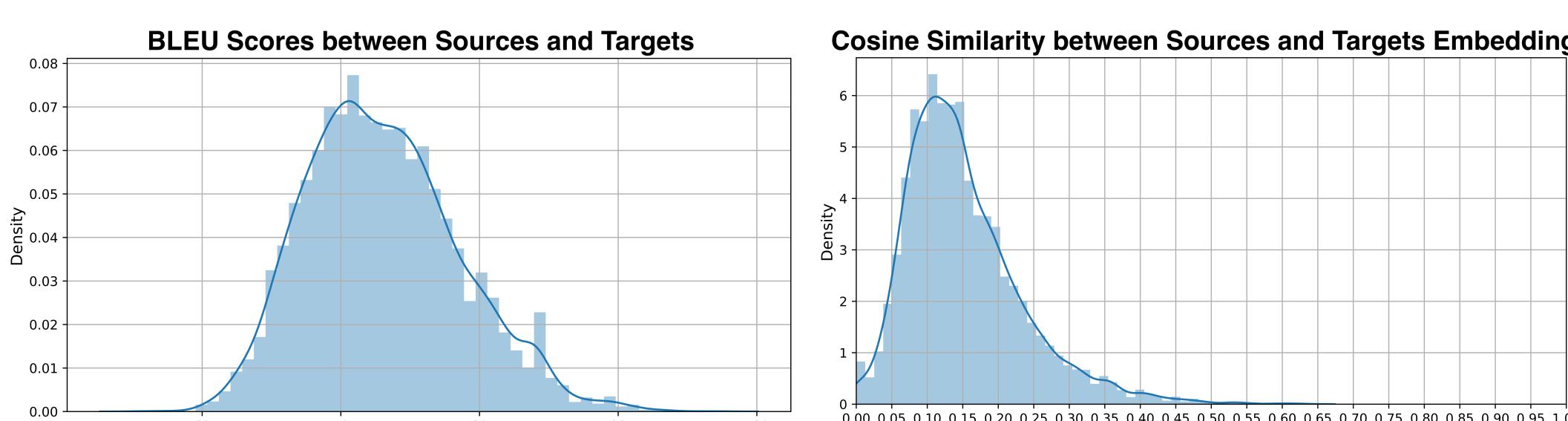


Fig. 1: Evaluation of raw language similarity. Left: BLEU scores. Right: cosine distance of embeddings.

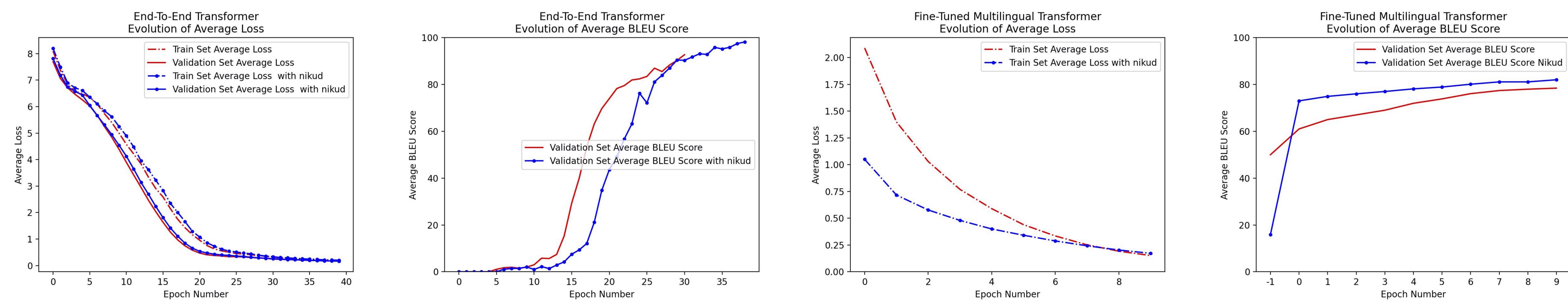
בראשית ברא אלהים את השמים ואת הארץ

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Results

- We gain insights into the effects of pretraining, and *nikud* on Hebrew-to-Hebrew translation. We evaluate the rate of convergence of our models and examine their performance on biblical texts and free-inputs.
- Training Evolution**
Regardless of the input type, **both of our models have successfully learned** to reduce their training loss when trained on Biblical Hebrew sentences alongside their Modern Hebrew translations as supervision.



Input Sentence	Input Sentence English	baraitha baria alhem at shemim vat haarez	בראשית ברא אללים את השמים ואת הארץ	קער פזול הוא קער כי בוגה	ההר הנדור הוא הרו כי בוגה	ההר הנדור הוא הרו כי בוגה כי בוגה רצית, חור יפה עיר יונס.	ההר הנדור הוא הרו כי בוגה כי בוגה רצית, חור יפה עיר יונס.
Model Name							
FTMT	In the beginning God created the heaven and the earth.	In the beginning God created the heaven and the earth.	The biggest mountain is the tallest mountain.	The biggest mountain is the tallest mountain.	You are beautiful my wife, you are beautiful your eyes like doves.	You are beautiful my wife, you are beautiful your eyes like doves.	
	בראשית ברא אללים את השמים ואת הארץ	בראשית ברא אללים את השמים ואת הארץ	הגדיל הדר הוא האגוזה ההר	הגדיל הדר הוא האגוזה ההר	שאה דמי שפכית ורינו נור או פיך הין שפכית פאה דמי שפכית אט פיך היא שלך	פאה דמי שפכית פאה דמי שפכית אט פיך היא שלך	
FTMT Nikud	In the beginning God created the heaven and the earth.	In the beginning God created the heaven and the earth.	The biggest mountain is the tallest mountain.	The biggest mountain is the tallest mountain.	My beautiful wife beautiful your eyes like pigeons.	My beautiful wife beautiful your eyes like pigeons.	
ETET	No output.	At the beginning God created the heaven the earth and the	The Cohen (repeats).	The big mountain is the tallest mountain.	Beautiful Wine Shedding Ideas The Wine Shedding...	Beautiful Wine Shedding Ideas The Wine Shedding...	
ETET Nikud	No output.	Please in them there were gods and the name	The husband son husband is.	The husband son husband is.	My wife you are beautiful your eyes like doves.	My wife you are beautiful your eyes like doves.	

Fig. 4: Example translations with both of our methods.