MT5 Trained with the samanantar dataset (Marathi)

500,000 data points (about 1/6) of the dataset were used during training, by loading 100,000 datapoints at a time.

BLEU scores

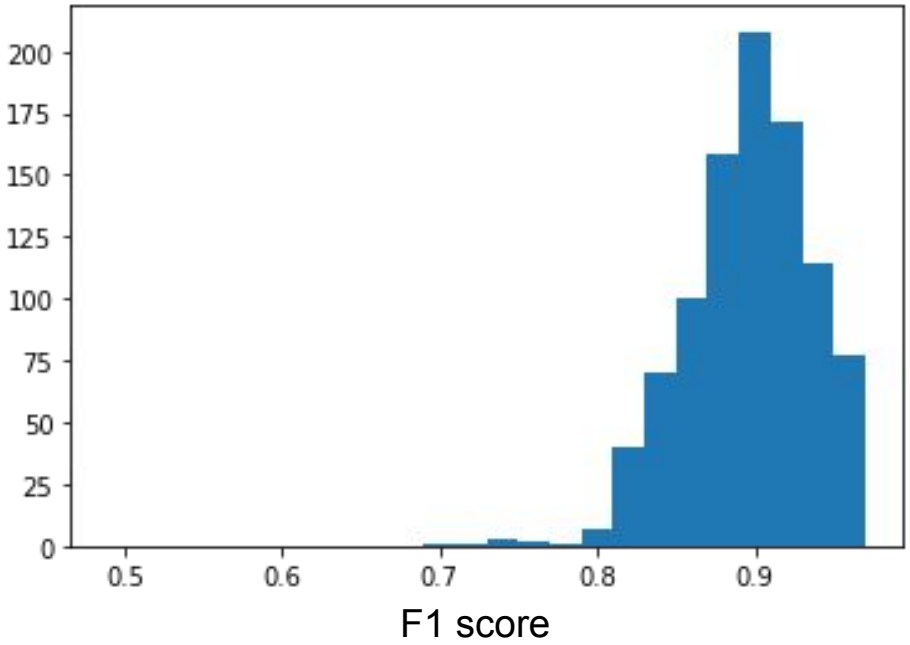
Evaluation was done using the 2000 points from the same dataset:

English to Marathi - 8.47 BLEU score
Marathi to English - 12.32 BLEU score

After each step in training, we see Marathi to English translations to be about 50% higher BLEU scores compared to English to Marathi Translations
Due to not training over the whole dataset, the BLEU score is low, due to low number of overlapping n-grams (Since BLEU looks for exact matches and the model uses synonyms in translating) .

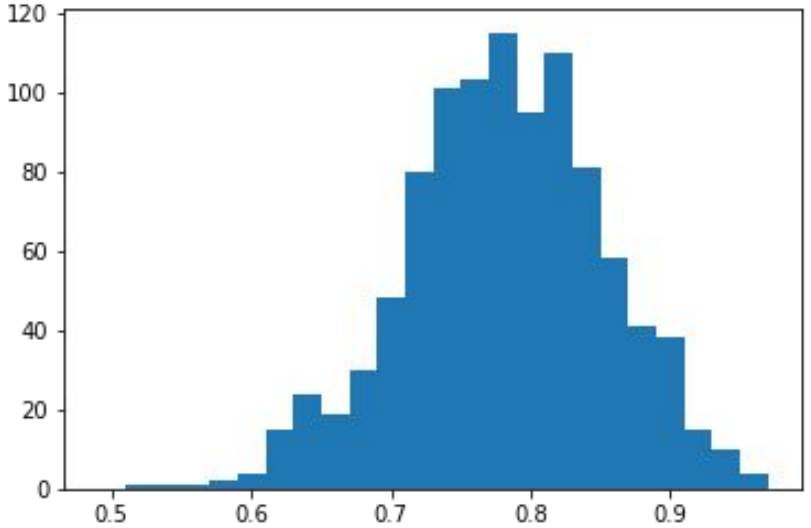
BERT scores - Marathi to English

The BERT score shows a better performance from the model than the BLEU score implies, with scores mostly being from 0.85-1.



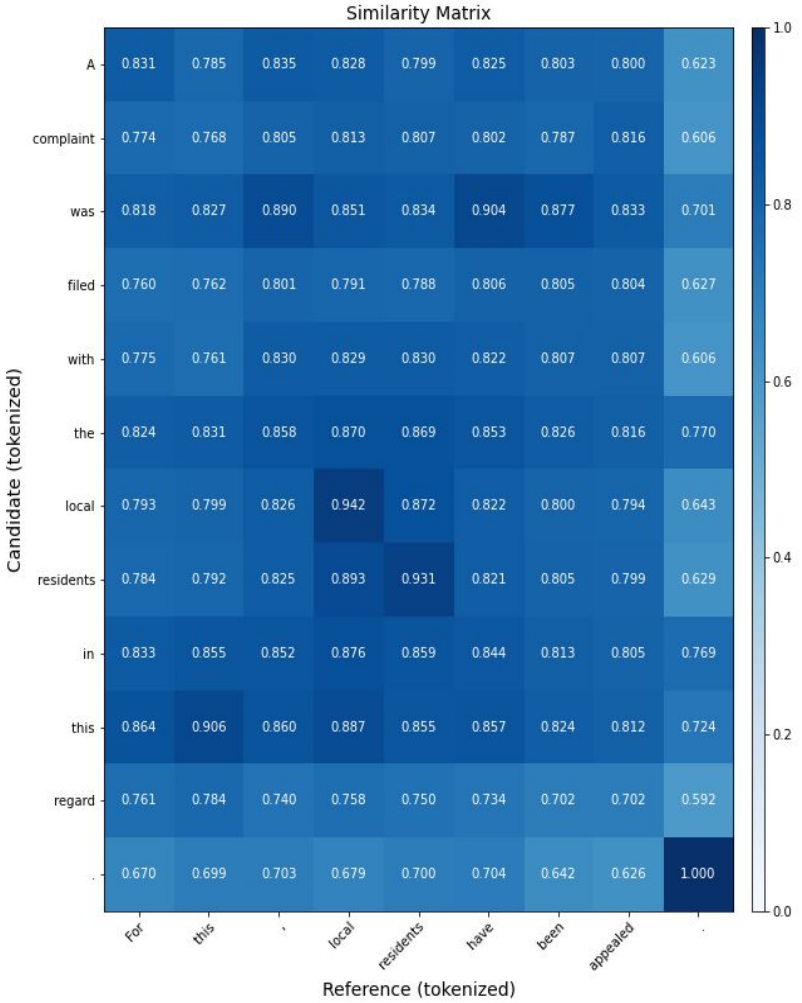
BERT scores - English to Marathi

English to Marathi once again shows a worse performance than the other way round, with most scores being from 0.75-0.85.



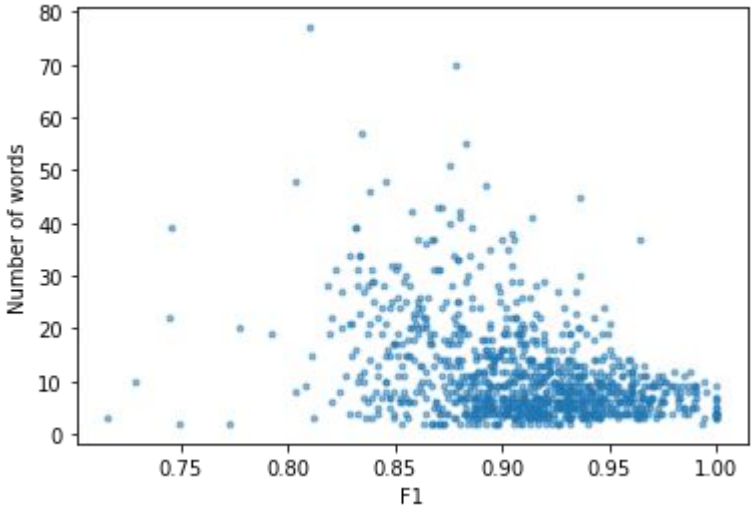
F1 score

The high value of Bert score shows that our model performs well, but uses some synonyms, which the BLEU score does not take into account (eg: A complaint has been filed with the local residents in this regard - For this the local residents have been appealed)



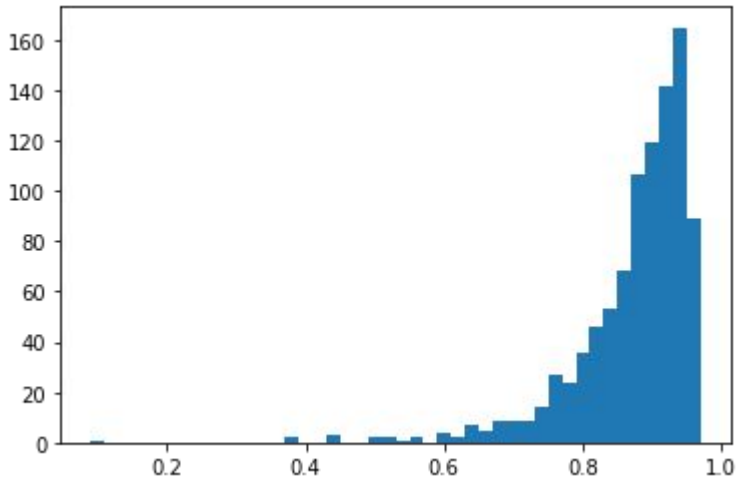
Translation quality by length of sentence

The scatter plot shows the sentence length (number of words) and the corresponding BERT score. We see as the sentence length increases, the translation quality decreases, as is expected. We see that most sentences with less than 10 words have a BERT score more than 0.90.



Spacy scores - Marathi to English

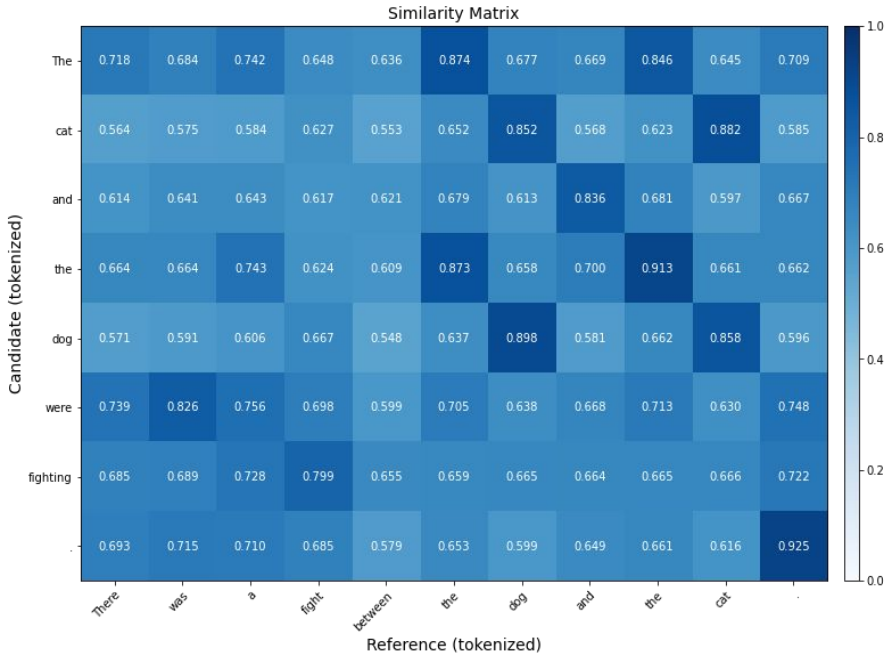
The Spacy score has been shown for the English predictions. It is concentrated around 0.8- 1.0.



Example translations

True sentence	Predicted Sentence
The cat and the dog were fighting.	There was a fight between the dog and the cat.
The dog will fight tomorrow.	There is going to be a dog fight tomorrow.
The dog fought all day.	Those dogs were fighting all day.
John went to Adithya's house.	John ran to Adithia's house
The man was sleeping on the bed.	The man was lying on the bed.

The model often changes the tense of the verb/ changes the structure of the sentence, but preserves the meaning.


Similarity Matrix
Candidate (tokenized)
Reference (tokenized)
The 0.718 0.684 0.742 0.648 0.636 0.874 0.677 0.669 0.846 0.645 0.709
cat 0.564 0.575 0.584 0.627 0.553 0.652 0.852 0.568 0.623 0.882 0.585
and 0.614 0.641 0.643 0.617 0.621 0.679 0.613 0.836 0.681 0.597 0.667
the 0.664 0.664 0.743 0.624 0.609 0.873 0.658 0.700 0.913 0.661 0.662
dog 0.571 0.591 0.606 0.667 0.548 0.637 0.898 0.581 0.662 0.858 0.596
were 0.739 0.826 0.756 0.698 0.599 0.705 0.638 0.668 0.713 0.630 0.748
fighting 0.685 0.689 0.728 0.799 0.655 0.659 0.665 0.664 0.665 0.666 0.722
. 0.693 0.715 0.710 0.685 0.579 0.653 0.599 0.649 0.661 0.616 0.925
There was a fight between the dog and the cat .
1.0
0.8
0.6
0.4
0.2
0.0

Example translations

True sentence	Predicted Sentence
Rohith fought with the cat.	Rohit fought with the dog.
The vehicular movement on Aanandpur-Shikaripur road has been suspended as the road is waterlogged.	Traffic has been disrupted on the Gadchiroli-Chandigarh road.
The cat was fighting the dog	The dog was fighting.
The floods ravaged Sangli and Kolhapur.	In Kolhapur and Sangli districts, floods have wreaked havoc.
Mary was Tom's first girlfriend.	Mary Tom was Tom's first girlfriend.

We see that the model has problems with translating some nouns, especially proper nouns.