

Models comparison

Enrico Ladisa

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1 Baseline Model

Model used as baseline. The model takes in input the embeddings of the words of the sentence and computes the average.

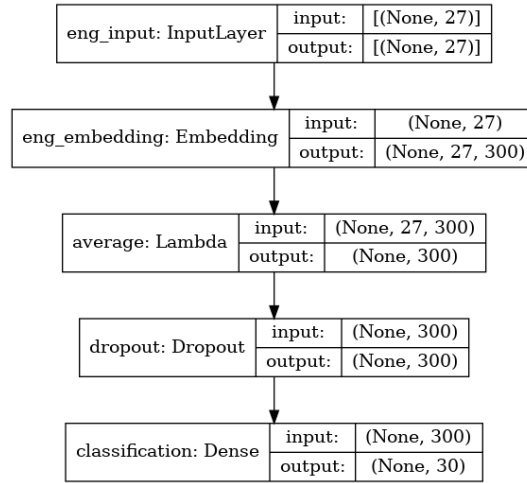


Figure 1: Baseline model architecture.

Set	Loss	Accuracy	Recall	Precision
Training	1.8795	0.5494	0.1092	0.8427
Validation	1.968	0.5114	0.1009	0.8106
Testing	1.9286	0.5446	0.0969	0.8173

2 English Recurrent Model

This model applies a recurrent layer of GRU cells to the list of the embeddings of the sentence.

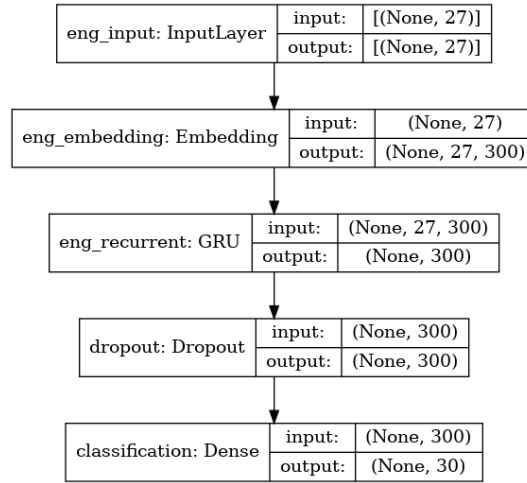


Figure 2: English model architecture.

Set	Loss	Accuracy	Recall	Precision
Training	0.2272	0.9389	0.9091	0.9605
Validation	0.8032	0.7895	0.7434	0.8414
Testing	0.8141	0.7738	0.7337	0.8213

3 Japanese Recurrent Model

This time we apply the same recurrent architecture to the japanese translation of the sentences.

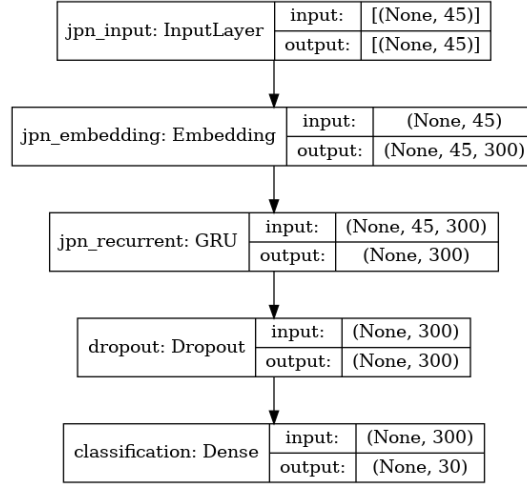


Figure 3: Japanese model architecture.

Set	Loss	Accuracy	Recall	Precision
Training	0.4042	0.8832	0.8287	0.9293
Validation	0.8971	0.7494	0.6977	0.8309
Testing	0.85	0.7596	0.7067	0.8349

4 Italian Recurrent Model

This time we apply the same recurrent architecture to the italian translation of the sentences.

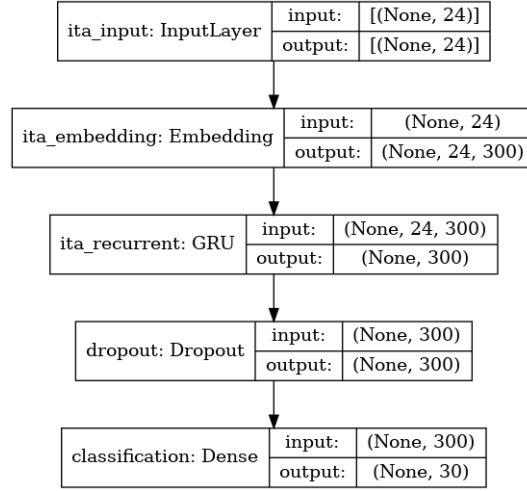


Figure 4: italian model architecture.

Set	Loss	Accuracy	Recall	Precision
Training	0.3592	0.9012	0.84	0.948
Validation	1.027	0.7227	0.6492	0.8
Testing	1.0325	0.7282	0.6627	0.8089

5 Eng-Jpn Model

This model combines the outputs of the recurrent layers of the english and japanese model. The sentence embeddings are first concatenate, then the dimension of the result is reduced to 300 by a Dense layer. This is done so that the sentence embedding to classify has the same dimension of the ones produced by the single-language models.

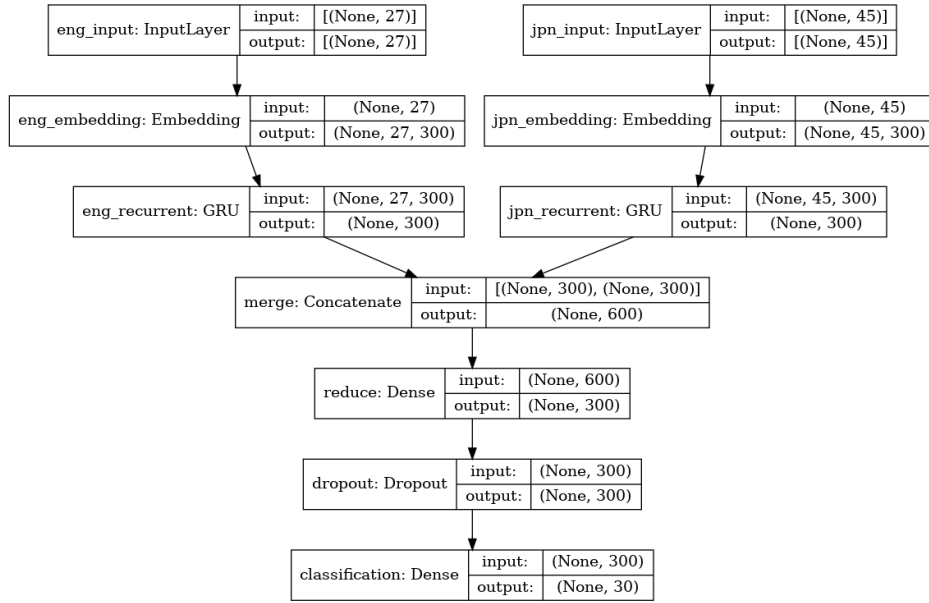


Figure 5: Eng-Jpn model architecture.

Set	Loss	Accuracy	Recall	Precision
Training	0.1775	0.9487	0.9278	0.9631
Validation	0.627	0.8211	0.7898	0.8616
Testing	0.615	0.8277	0.792	0.8728

6 Eng-Ita Model

Same as before but using Italian as second language.

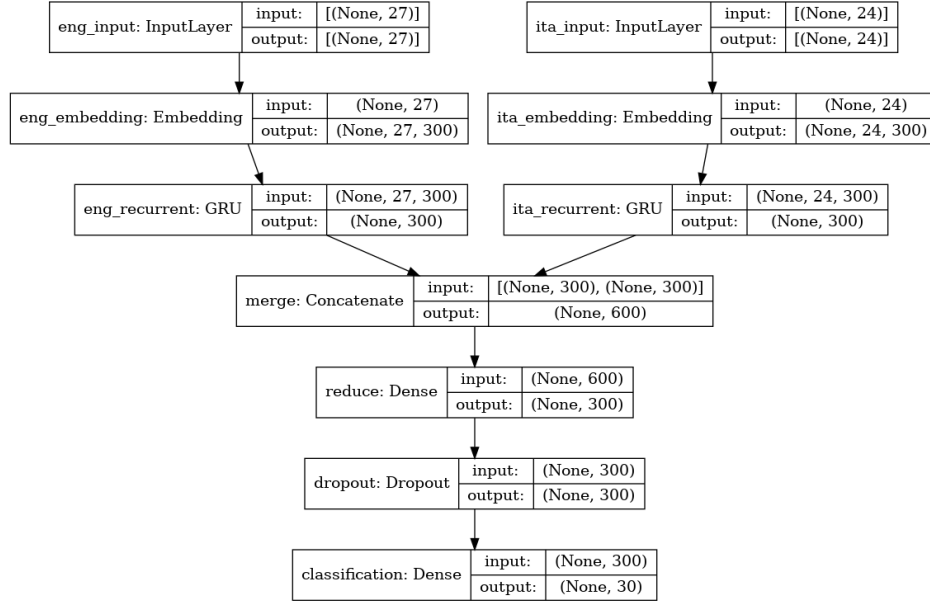


Figure 6: Eng-Ita model architecture.

Set	Loss	Accuracy	Recall	Precision
Training	0.2007	0.9484	0.9183	0.9651
Validation	0.7326	0.8056	0.7525	0.853
Testing	0.7335	0.8058	0.7541	0.8525