Dialogue Processing on Twitter

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Purpose of Study

1. Analyse twitter dialogues
2. Propose a set of dialogue acts
3. Produce a hand-labelled corpus based on the Twitter English dialogues.
4. Model these dialogues in (3) using a Neural Network
5. Evaluate the model in (4)

Hand labeled corpus

1. Analyse twitter dialogues
2. Human-human conversations on Twitter.
3. >= 5 tweets per conversation
4. 148 dialogues consisting of a total of 1039 tweets.

Annotation

1. 2 annotators
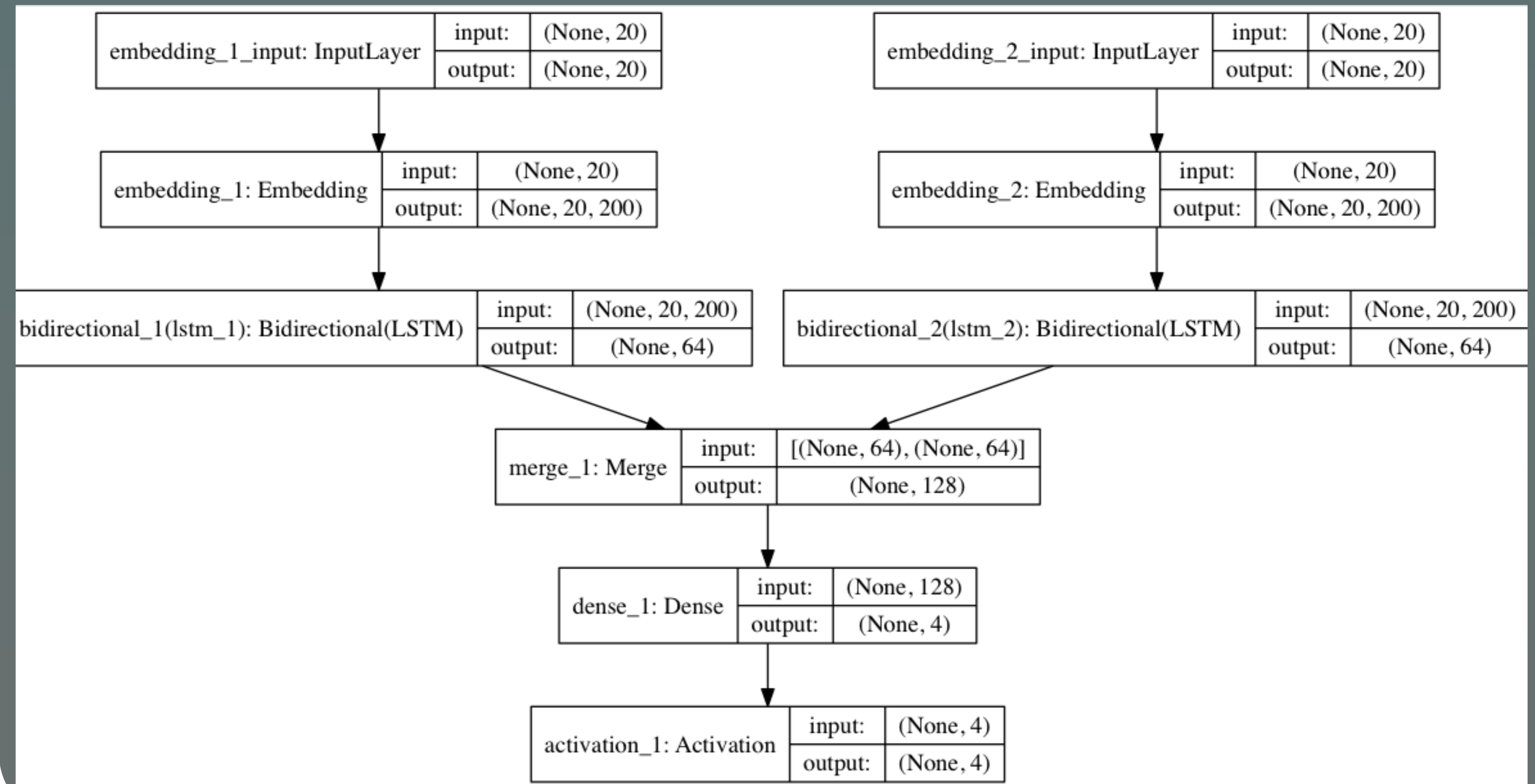2. 33 dialogues (162 tweets)
3. Inter-Annotation Agreement, 85.12%

Bi-directional LSTM Model

Comparison of models

Model	Tags	No of tweets	Accuracy	Chance Accuracy
LSTM	2	1039	52.0	53.0
LSTM	4	1039	**53.4**	40.0
LSTM	10	1039	46.0	47.5
LSTM	10	162	46.0	47.5
Bi-LSTM	4	891	**60.0**	40.0

Precision, Recall & F-measure for Bi-LSTM with 4 tags

Tag	Precision	Recall	F-measure
S	0.59	0.88	0.71
P'	0.53	0.08	0.13
Q'	0.81	0.75	0.78
W'	0.53	0.31	0.39
Average	0.62	0.38	0.43

Tag set (Dialogue acts)

Index	Label	Abbr
1	Statement	S
2	Request (Recommendation)	R
3	Rhetorical Question and Y/N Question	Q
4	Open Question	O
5	Agreement	A
6	Reject (Disagreement)	D
7	Thanking	T
8	Opinion	P
9	Greet and Acknowledgement	G
10	Open answer, N answer and Y answer	W

Re-merged tag set

Index	Previous tag(s)	Merged tag
1	S	S
2	O + Q	Q'
3	T + G + P + A	P'
4	D + W + R	W'
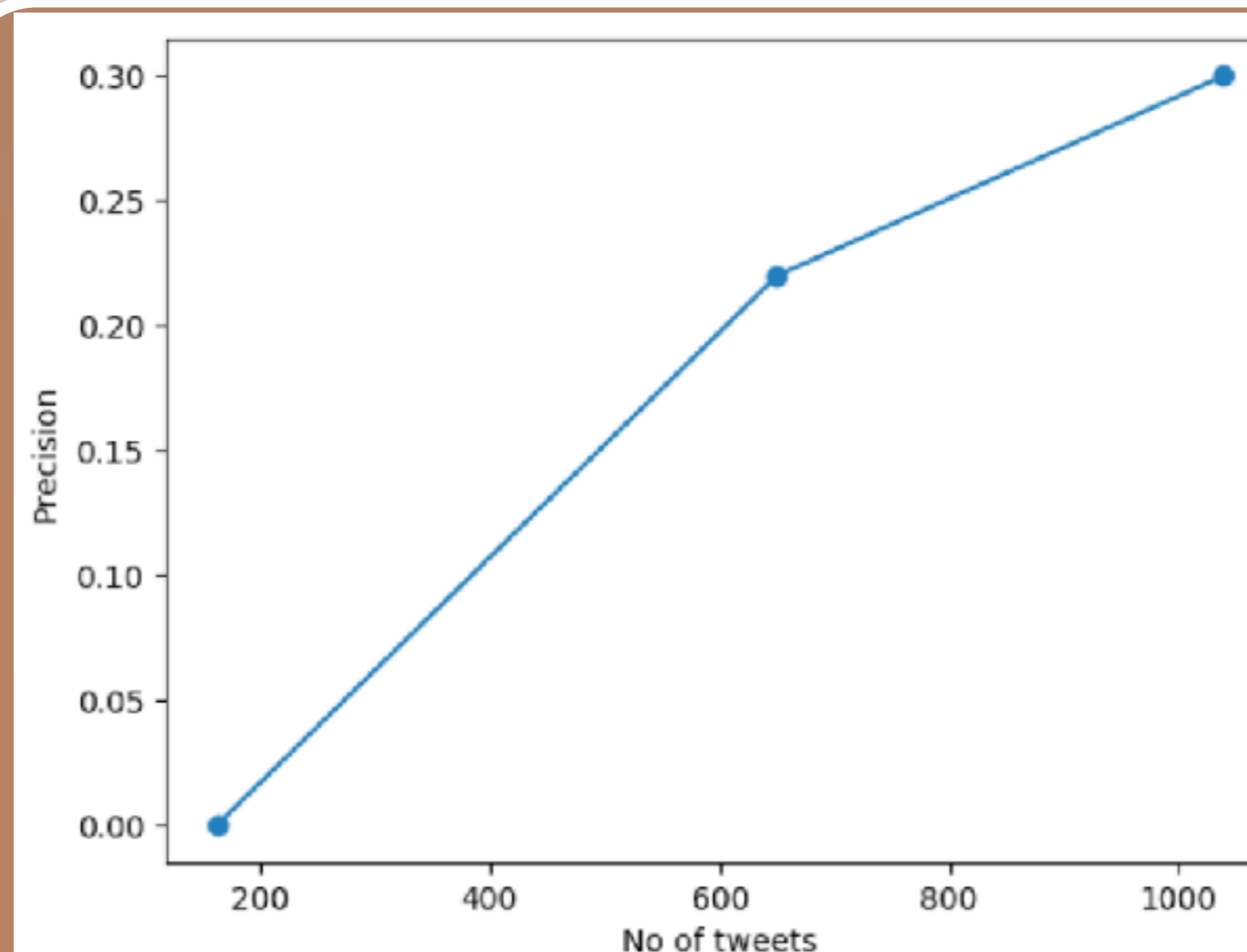
Effect of training data volume on precision

Future work

1. Re-merging the labels considering semantic and syntactic structure of the labels.
2. Increasing the amount of training data (adding more hand-labeled data to the corpus).
3. Having a balanced corpus wrt to the dialogue acts defined.