

Assistive technology using devices

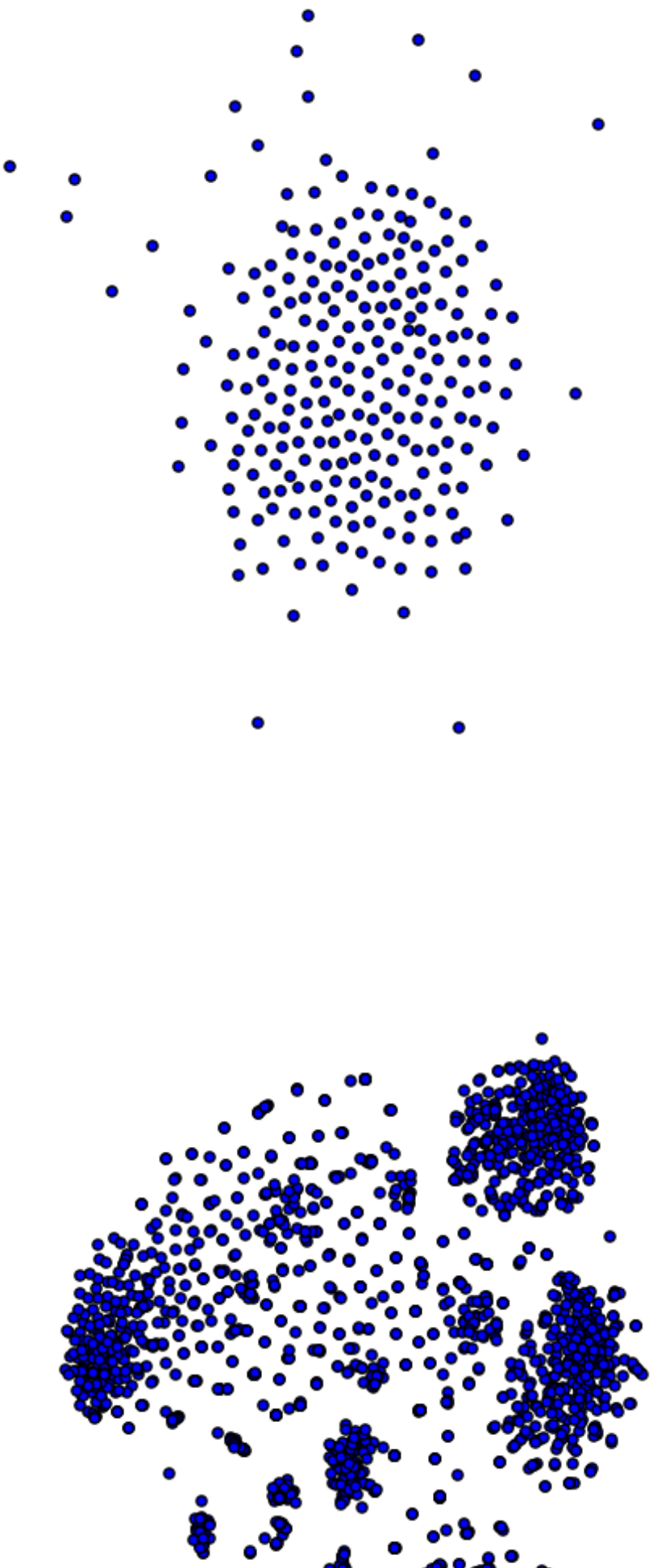
Introduction and Motivation

Discussion forums pose an interesting setting for human interaction and play an increasingly important role for people, both in professional and personal lives.

This work presents a discussion forum assistant that aims to help people find their way around a forum and give intelligent suggestions on where to get the information that they need. The assistant is based on deep recurrent neural networks (RNNs) trained to perform three different tasks when faced with a question from a user:

- 1. recommend related posts.**
- 2. recommend other users that might be able to help.**
- 3. it recommends other channels in the forum where people may discuss related topics.**

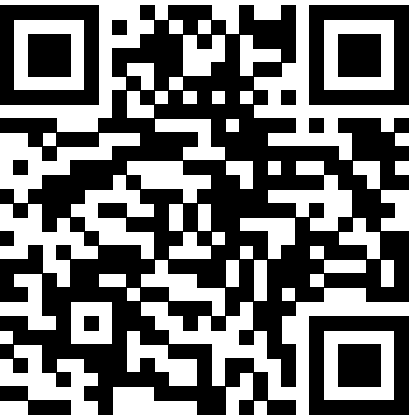




T-SNE projections of forum post representations.

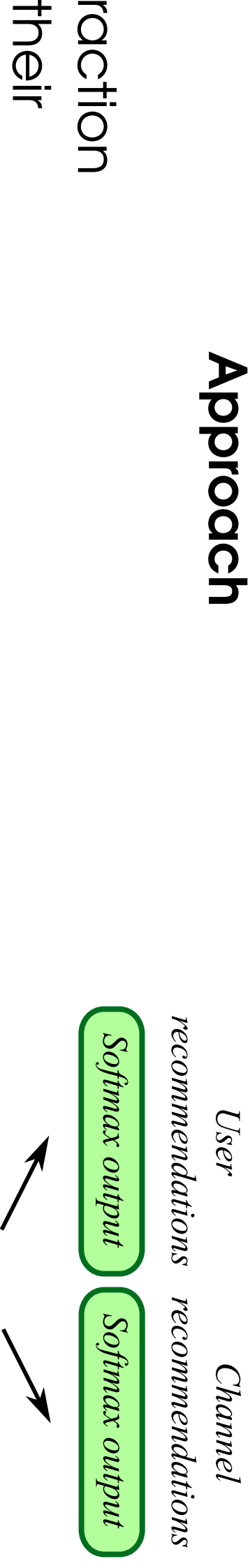
Left: posts are represented as a sum of embeddings from **W** the words in each post.

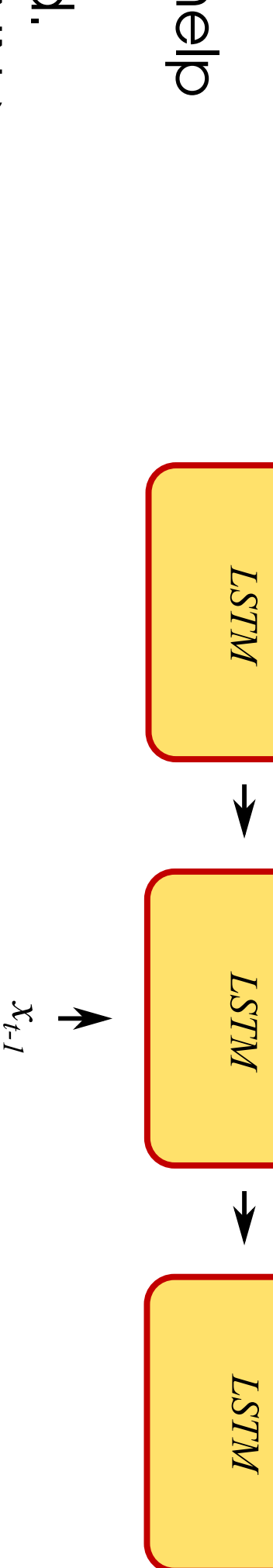
Right: the internal state of an **LSTM** network is used as the representation. Posts were taken from a channel about mobile app development. You can see that while the word-embedding sum baseline clustered together, LSTM representations result in easily separated clusters.



Engaging discussion forum using deep recurrent neural networks

Approach



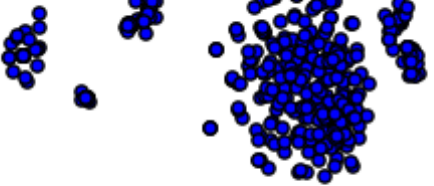


The layout of our recommendation model. The recommendation of users and channels are modelled as two different softmax output layers, attached to the end of a deep recurrent LSTM network modelling the input.

Results

	Positive	Negative	No reaction
Users	70.4%	6.1%	23.5%
Channels	80.9%	4.8%	14.3%
Posts LSTM	42.1%	47.4%	10.5%
Posts W2V	35.7%	57.1%	7.1%

The results from the live user study. Percentage is



The results from the live user study. Percentage is based on the total number of reactions to the agent's actions (and an action from the agent that resulted in no reaction from users is counted as "no reaction"). For users and channels recommendations most reactions are positive, suggesting that our assistant is useful to the forum users.

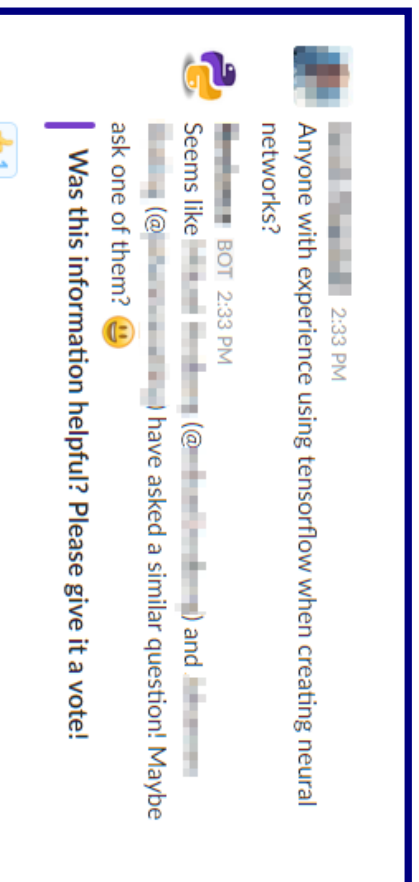
Word2Vec over

representation.
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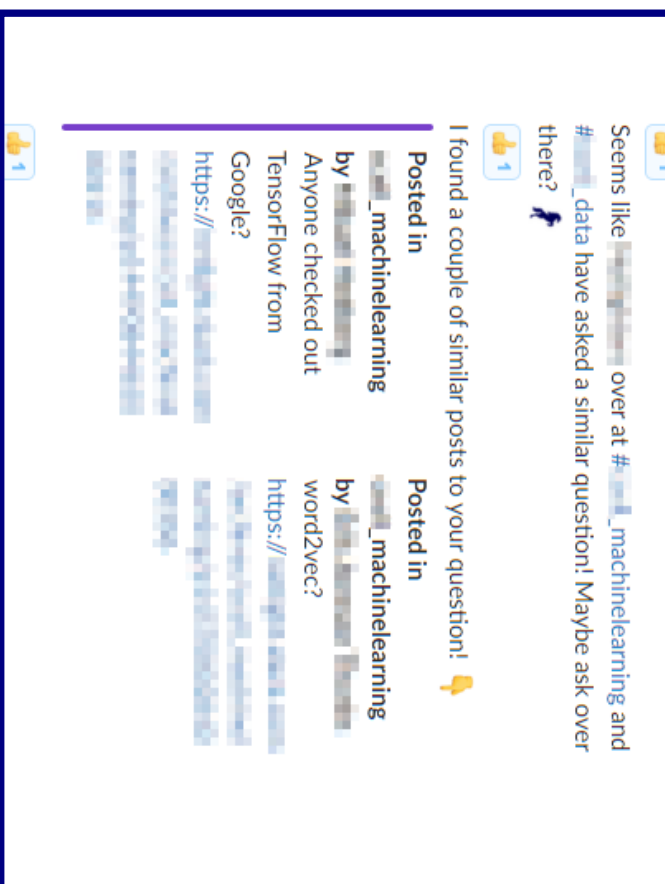
are all

variable clusters.

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An example interaction with the assistant.

Conclusions

1. Post-recommendations are often useful, but tend to be related to question in a generic way.
2. pretraining the RNN as a language model with a general corpus (Wikipedia) gives substantially better suggestions of related posts.

3. Recommendations for forum users and forum channels are good.

Future work

1. Representations for post recommendations
2. A/B testing
3. Sequence-to-sequence
4. Reinforcement learning

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