

Deep Neural Language Generation with Emotional Intelligence & External Feedback

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Chatbots:

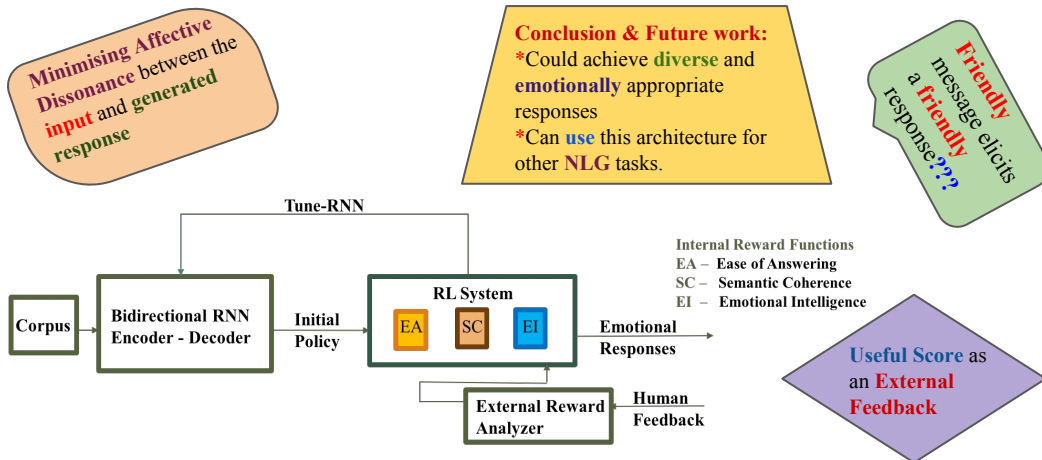
- Change ways in which customers interact with the companies
- Used in eCommerce, Health Care Systems and so on.
- Very difficult to generate sensible emotional responses to make interactions as effective as possible.

Architecture Details:

- **Bidirectional RNN** Seq2Seq **Encoder-Decoder** with **Bahdanau** attention mechanism.
- Use of **Maximum Mutual Information** Objective function.
- **RL tuner system** with internal and external rewards to fine-tune the Seq2Seq model to generate diverse and emotional responses.

Tasks:

- A **Conversational Bot** to give emotionally appropriate responses that is trained using **Cornell Movie Dialog Corpus**.
- A **Review Completion Bot** that could complete the restaurant review and is trained on **Yelp Restaurant Review Dataset**.



Challenges:

- ❖ Dull Responses
- ❖ Ungrammatical
- ❖ Lack of Coherence
- ❖ Lack of Emotional Intelligence



Sample Responses:

Conversation

Prompt: it is just the strain again , the stress . we will take a vacation.

Response: i appreciate that.

Review Completion

Prompt: when the grand lux in our mall in co closed, we lost our favorite happy hour place. now we fly to vegas once a year to enjoy some asian nacho goodness and potato spring rolls. we love being able to enjoy a date night dinner of delicious.

Response: great staff, great portions , good wine!!! it's a must if and in vegas for a week and came to this restaurant three times. the pad thai is amazing!!! i had the steak kabob and it was tasty and juicy.

Human Evaluation:

Emotional Appr. Score for conversational agent is **1.44**
Emotional Appr. Score for review completion agent is **1.73**

References:

- 1) J. Li, W. Monroe, A. Ritter, D. Jurafsky, M. Galley, and J. Gao, "Deep reinforcement learning for dialogue generation," in Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing, pp. 1192–1202, Association for Computational Linguistics, 2016.
- 2) N. Asghar, P. Poupard, J. Hoey, X. Jiang, and L. Mou, "Affective neural response generation," in European Conference on Information Retrieval, pp. 154–166, Springer, 2018.