**A Network-based End-to-End Trainable Task-oriented Dialogue System**

**Methodology**

In this paper, they introduce a neural network-based text-in, textout end-to-end trainable goal-oriented dialogue system along with a new way of collecting dialogue data. This approach allowed them to develop dialogue systems easily and without making too many assumptions. The results they got shows that the model can have a conversation with human naturally whilst helping them to accomplish tasks in a restaurant search domain. In this paper they are trying to build task-oriented system, restaurant search dialog system.

According to the author, building a task-oriented dialog system is difficult because there is less availability of training data. This is problem is solved by reinforcement learning.

**Models**

They have treated dialogue as a sequence to sequence mapping problem (modelled by a sequence-to-sequence architecture) augmented with the dialogue history (modelled by a set of belief trackers) and the current database search outcome. At each point, the input to the system is sequence of token2 and convert it into internal representation generated by intent network. After this, most probable value is selected by database operator to form a query and then search result along with intent representation are combined by policy network to form single vector representation to next system. The response of system action vector is given to response generation network which generates system output. The final system response is then formed by substituting the actual values of the database entries into the skeletal sentence structure. The intent network is nothing but the encoder in sequence to sequence learning framework.

**Conclusion**

* This paper has presented the innovative neural network-based framework. The model is end to end trainable using two supervision signals and a modest corpus of training data.
* The paper has also presented a novel crowdsourced data collection framework inspired by the Wizard-of-Oz paradigm.
* They demonstrated that the pipe-lined parallel organisation of this collection framework enables good quality task-oriented dialogue data to be collected quickly at modest cost.
* The experimental assessment of the NN dialogue system showed that the learned model can interact efficiently and naturally with human subjects to complete an application-specific task.