Chatbot Technology to Teach Active Listening Skills

PennState

RERC on AAC

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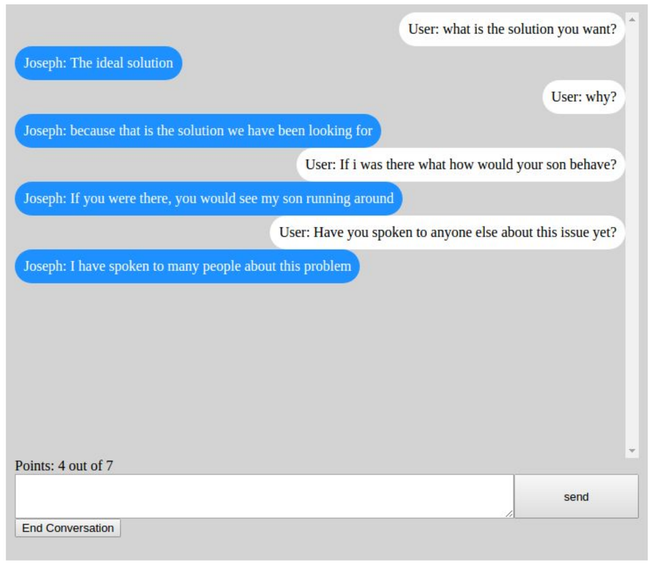
Introduction

- Parents play a critical role in the lives of children with disabilities.
- Active Listening is an important skill that helps bridge the gap between the family of the child with a disability and the professional, providing better outcomes.
- A large component in teaching Active Listening skills to pre-service professionals is through role playing.
- This project developed a chatbot that plays the role of the parent of a child with a disability so that a pre-service professional can practice Active Listening skills.

Methods and Results

Chat Interface

- The user interacts with a bot (e.g. Joseph) playing out a scenario loaded in the knowledge base.
- The User is awarded points for particular questions set by the administrator.



Naive Bayes Classifier

- The bot chooses what to say by utilizing a Naive Bayes classifier.
- Probabilities are calculated by using word counts.
- The previous response made by the bot is considered in its decision.

$$P(response|input) = \frac{P(input|response) * P(response)}{P(input)} = \frac{P(response)\prod_{i=1}^{n} P(word_i|response)}{P(input)}$$

$$\max_j \prod_{i=1}^{n} P(word_i|response_j) * P(response_j|response_{prev})$$

Admin Site

- The admin site is used to teach the bot new scenarios to role play.
- Responses are learned by providing example questions.
- Context is learned by linking responses together.
- Responses become more accurate as more examples are learned.
- Points awarded can be set for each response.

Results Summary Page

Name: Joseph
Description: The parent of a child using AAC

You Said	Joseph Said	Ideal Question	Points Awarded
what is the solution you want?	The ideal solution	What would you see as the ideal solution?	1
why?	because that is the solution we have been looking for	why	1
If i was there what how would your son behave?	If you were there, you would see my son running around	If I was there, what would I see?	1
Have you spoken to anyone else about this issue yet?	I have spoken to many people about this problem	Have you spoken with anyone else about this?	1

Total Score: 4 / 7

Conclusion

- User chat site and admin site implemented
- Chatbot is a retrieval based agent that uses a Naive Bayes classifier to decide what response to reply with.
- Next step is to determine the effectiveness of using a chatbot to teach Active Listening skills.
- Further research can go into assessing alternative and/or improving the current response classifier.

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