
Two-Layered Dialogue Framework to Experiment with Games and Gamification

Jieming Ji Qingyun Wang Zev Battad Jiashun Gou
jij@rpi.edu wangq16@rpi.edu battaz@rpi.edu gouj@rpi.edu
Jingfei Zhou Rahul Divekar Craig Carlson
zhouj5@rpi.edu divekr@rpi.edu cjcarlson20@gmail.com
Mei Si
sim@rpi.edu
Rensselaer Polytechnic Institute
Troy, NY 12180

Abstract

1 In recent years, chat-bots that assist people’s daily life gained tremendous popular-
2 ity, such as Siri, Cortana, Alexia and Google assistant. Typically, conversations
3 with chat-bots are task orientated and brief. In this work, we explore creating social
4 bot that can complete task and entertain user.

5 We proposed a two-layered dialogue framework which allows for flexible reuse and
6 reorganization of individual task based dialogue modules. Utilizing this framework,
7 we experimented with multi-module dialogue frameworks to analyze how dialogue
8 functions and user characteristics affect user engagement.

9 1 Introduction

10 The history of chat-bots can be traced back to when Eliza and many others, such as Mitisuku [1],
11 were developed with templates for engaging the user in human-like conversations that ultimately
12 aims at pass the Turing test. Typically, users’ conversations with these chat-bots do not include the
13 exchange of useful information.

14 In recent years, chat-bots that assist people’s daily lives such as Siri and Alexa have gained tremendous
15 popularity. Passing the Turing test is not their goal. Rather, they function as a personal assistant
16 by answering questions, reminding events, and controlling smart home devices. From the social
17 conversational perspective, however, a shorting coming of this type of chat-bot is that they are always
18 directed by the user and are mostly passive during the conversation.

19 In this project, we aim at creating an adaptive framework that can blend these two trends. We
20 want the dialogue with the chat-bot to be both informational and entertaining. For realizing such a
21 goal, we developed a two-layer dialogue management system. At the bottom layer, we developed
22 individual dialogue modules that are specialized at providing specific functionalities and can be used
23 alone. At the top layer, we use a dialogue manager to coordinate those individual dialogue modules.
24 Thus, our framework provides users the freedom to choose specific modules and explore a world of
25 functionalities.

26 In the next section, we will briefly go over the system architecture of the main dialogue manager as
27 well as the individual dialogue functions. We will then present our preliminary evaluation results,
28 followed by discussions.

29 **2 Functional Design and Architecture**

30 **2.1 Architecture**

31 We have used two architecture for our chat-bot:

- 32 • A system designed to run purely on AWS Lambda that runs the dialogue manager and all
33 modules.
- 34 • A system designed to use AWS Lambda as a channel to pass all information through to the
35 Main EC2 which runs flask[2] to host all modules.

36 The overall design of the system is centered around two parts:

- 37 • A series of modules representing different pieces of functionality in the chat-bot, such as
38 exploring news, playing word games, and engaging in chitchat [3]. These functions have
39 been documented in Tables 1, 2, and 3.¹
- 40 • A central conversation flow manager through which the system's different modules are
41 exposed to the user.

42 We have created three versions of the dialogues manager. In the last version, we gamified conversation
43 by manually embedding all modules created in previous iterations into a detective game (Figure 2).
44 As part of our future work, we plan to develop an automated embedding system which can incorporate
45 arbitrary dialogue modules using dialogue managers that looks at the best match between supported
46 functionality and required interaction properties, e.g. the dialogue module requires a little vs. a lot of
47 user effort. Such a system can potentially incorporate chat-bots developed by other developers into a
48 larger dialogue system or even an RPG game.

49 **2.2 Dialogue Functions**

50 In this section, we will describe these modules' functionality. Our modules perform similar tasks as
51 many existing chat-bots, such as recommending trending news, performing web search, providing
52 daily horoscopes or making a joke[4]. When designing these modules, we had two emphases. One is
53 a focus on diversifying services to provide a wide variety of user activities. The other emphasis is
54 to explore the possibility of leveraging crowd sourced content for supporting user interactions. In
55 particular, our news related modules are capable of pulling news articles and people's comments from
56 multiple social media sites and our message board allows users to interact with each other. Thus, even
57 though the bot itself is not capable of discourse, the user can experience interacting with other people.

58 In Tables 1, 2, and 3, we list all the individual dialogue modules with a brief description of their
59 designs. These modules can be roughly divided into three categories: those that provide information
60 to the user, those that entertain the user, and those that chat with the user.

Table 1: Summary of Information and Discussion modules.

Module Name	Short Description
Twitter Search	Provide various tweets and replies given specific topic by user or recommend general topics for user to explore.
Twitter Trends	Explore various tweets with top trending hash tags.
Reddit Search	Provide various Reddit submissions and comments given specific topic by user or recommend daily hot topic for user to explore.
Web Search	Use DuckDuckGo to return web search result.
QA	Use evi.com to answer questions.
Message Board	A space where users can leave messages, read messages from other users, and vote messages up.

61 **2.2.1 Information and Discussions**

62 Since the majority of chat-bot users are accustomed to asking chat-bot for information, we im-
63 plemented QA and Web Search functions based on existing web APIs. Providing news is also a

¹For sample interactions on all individual modules, please see Appendix A.

64 common function of many chat-bots, e.g. Alexa has Flash Briefing. We attempted to make our news
 65 module more unique and useful by a) allowing the user to interact with it by specifying topics and b)
 66 presenting popular comments gathered from Twitter or Reddit related to news articles.

67 Initially, we extracted news from the Washington Post API with a simple template matching method
 68 to recommend related news. The problems were finding the correct topic and the coverage of the
 69 news. We then experimented using more comprehensive sources from News API[5] which provides a
 70 broader coverage and real time updates. We used Stanford NER [6] to retrieve keywords from news
 71 body, and summarized it using Genism [7]. We also used NLTK POS tagging[8] to find nouns in
 72 user’s response to further increase the number of possible topics. To provide related comments, we
 73 queried news headline in Twitter API.

74 To increase interactivity, we tried to find more interesting news sources and public opinions. We
 75 moved to more diverse news sources such as Twitter using Tweepy [9] and Reddit using PRAW [10].
 76 We first gathered news from Reddit and Twitter and collected people’s comments under the news
 77 section to ensure its uniqueness. Then, we recommend the most related news based on term frequency
 78 [11] and twitter or Reddit score. We also provide the user tweets with top trending hashtags in real
 79 time. Users can hear opinions of Twitter/Reddit users. To increase the precision and coverage of
 80 user-given topics, we use the dependency parser from SpaCy parser.[8]

81 2.2.2 Entertainment

82 We designed a rich set of entertainment functions, including a word game, an adventure games,
 83 jokes, riddles and daily horoscope. Our primary emphasis in designing these functions has two foci.
 84 We tried to make the instructions simple and easy to follow. To satisfy this goal, we limited user’s
 85 interactions within each module to a set of keywords the module is anticipating. We also tried to
 86 leverage special effects with the chat-bot’s voice to make the game experiences more unique, i.e.
 87 in the Word game, the bot will try to rhyme with the user. The user can also use words that rhyme
 88 with the bot’s last words as his/her response. In the adventure games, we used Speechcons[12] and
 89 SSML[13] to enhance the horror atmosphere.

Table 2: Summary of Entertainment modules.

Module Name	Short Description
Word Game	Word game similar to word chain[14]. The bot and user take turns giving words that rhyme or whose first letter matches the previous word’s last letter.
Text Adventure	Command-based text adventure in which the user tries to survive in a haunted house from a ghost.
Ghost Adventure	Command-based text adventure in which the user haunts an intruder in a haunted house.
Horoscope	Daily horoscope based on their birth sign.
Riddle	User tries to answer riddles, with explanations given after.
Joke	Deliver jokes in question-answer format.

90 2.2.3 Social Chats

91 Social chat is much like how people talk with Eliza, Alice and many social bots that developed
 92 dialogue rules responding to particular patterns of user input. The dialogue rules can span multiple
 93 conversational turns and thus provide the bot with a sense of personality and planning in the conversa-
 94 tion. We incorporated a modified version of AIML scripts from the Alice bot [15]. In addition, recent
 95 development in machine learning and NLP provide us the opportunity of creating a data-driven chat
 96 function. We used seq2seq model[16] trained on twitter chat data[17] as a backup chat function when
 97 the AIML based chat module can not make a relevant response.

Table 3: Summary of Social Chat modules.

Module Name	Short Description
Chitchat	Use basic sequence-to-sequence architecture with LSTM[18] modules for general input response trained on twitter.
AIMLbot	Use AIML-inspired python regex for templated responses patterns.

98 **2.3 Conversation Flow Management**

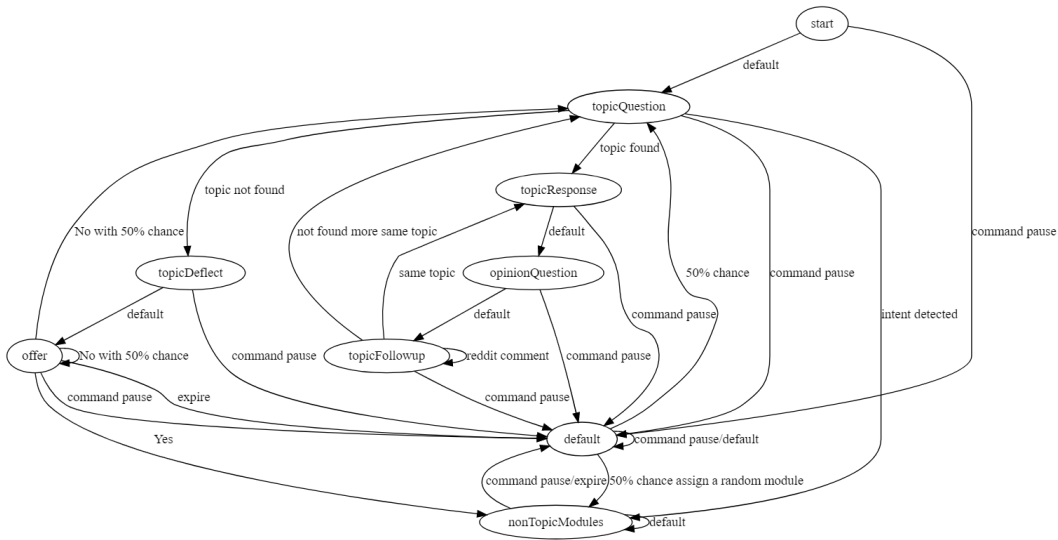


Figure 1: Topic based dialogue manager that moves through different states from the start based on the conditions indicated on the edges of each arrow.

99 In this section, we will show how the dialogue flow manager orchestrates individual modules to
 100 provide a satisfying dialogue experience. We implemented three dialogue managers throughout the
 101 competition, ranging from menu based user-initiative design to a game based narrative design. We
 102 will describe their design with pros and cons below.

- 103 • We started with a menu based dialogue manager that prompts the user with available modules
 104 to choose from. Each module implemented a handler for dialogue flow and exit conditions.
 105 When a predetermine number of turns for a module expire, a module will be randomly
 106 selected based on a pre-specified frequency table. Users can bring back the menu and choose
 107 modules using the "pause" keyword.

108 This version of our chat-bot provides the user with a clear interface and almost complete
 109 control over the conversation. However, the users have to repeatedly navigate through layers
 110 of the menus to reach the functionalities desired.

- 111 • To simplify the interaction, we designed a second version of the dialogue manager [19]
 112 which guides user interaction in Figure 1. The bot lets the user initiate the conversation
 113 with a topic of the user's choice. If the user's intention for non-topic based modules (all
 114 except Reddit Search) is recognized, the bot will lead the user directly to those modules.
 115 Otherwise, the bot will try to find the most relevant news then offer recommended modules.

116 This version differs from the menu based's reactive dialogue manager. It is a proactive
 117 manager that gives users pre-defined dialogue module sequences and aids users in choosing
 118 functions and topics to explore. We believe this design can ultimately lead to an efficient
 119 conversation that aids people in their everyday tasks.

- 120 • Our last and final attempt is gamifying the conversation to suit a unique user group who had
 121 leisure time to enjoy the process of exploration. We created a detective game as an overall
 122 thread for user to explore and interact with our various dialogue function. This is a new
 123 gamification strategy, differing from those[20] that use leader boards or badges. Thus, the
 124 pros and cons need further experimentation in the future to be thoroughly examined.

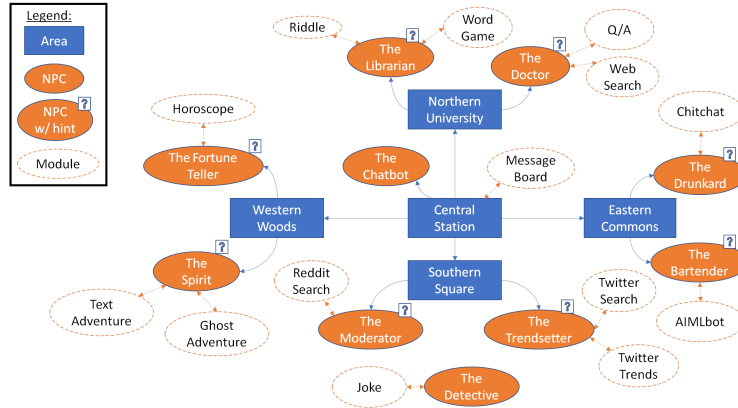


Figure 2: Modules, NPCs, and areas connected in the meta-game. Note that while directional arrows show implied hierarchy, user can move from any area to any other area.

125 Design of the Narrative Game

126 In this version of the dialogue manager, the conversation flow is gamified and access to each module
127 is placed in a virtual space (Figure 2).

128 The meta-game presented to the user involves finding and catching a thief who is one of the towns-
129 people in this virtual world. The player must collect hints as to who the thief by interacting with
130 townspeople.

131 The game world consists of two main constructs: Non-player characters (NPCs) and Areas they locate
132 in. NPCs are virtual characters in the game world. Areas are virtual locations that users may move
133 between and where NPCs are located. All modules, except for the Message Board, are associated
134 with one NPC that handles non global commands. Additionally, global commands, such as movement
135 and meta-game actions, are handled by the one NPC who do not have a dialogue module that is part
136 of dialogue manager. In this way, NPCs serve as personified wrappers for the chat-bot's functions,
137 providing in-character handling for all prompts, answers to prompts, and out-of-context handling.

138 For example, the design of The Librarian makes the character a bored clerk who loves to challenge
139 others to slack off. When The Librarian asks the user if they would like to try and solve Riddles or
140 play a Word Game, the offer to access either module is cast as a part of The Librarian's behavior.
141 This allows for a more forgiving experience when the chat-bot fails to respond appropriately or must
142 explain a prompt to a user.

143 The user collects hints after beating an NPC at a game or finishing their request. The entire dialogue
144 ends when the user either accuses two innocent people (lose) or the correct person (win). When the
145 user accuses the correct person and catches the thief, the thief's motivation for stealing the chat-bot's
146 voice and information about the character will be revealed. The user is then offered a chance to restart
147 the game with a random different perpetrator, hinting at the possibility of revealing more information
148 about other characters and the game world as a whole.

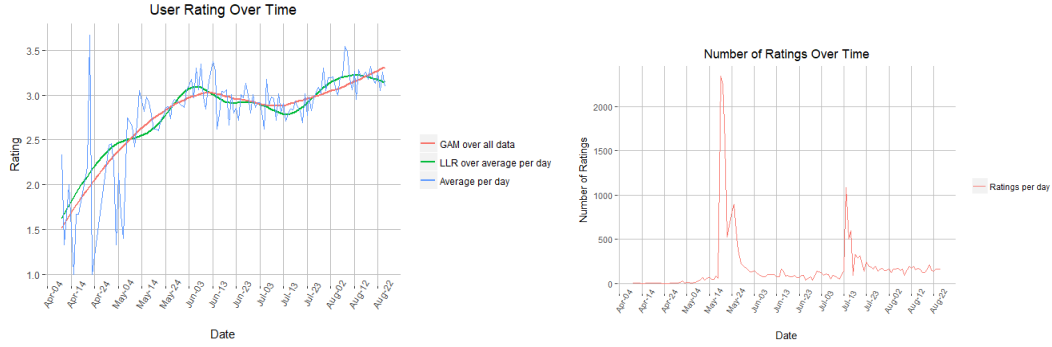
149 3 Evaluation and Discussion

150 3.1 Relationship between overall usages and user ratings

151 The chat-bot has no statistical models that consume Alexa Prize usage data and internal feedback.
152 Instead, both are used off-line to improve the system design in two ways:

- 153 • Identifying edge cases, unintentional use cases, and desired functionality from users.
- 154 • Identifying which changes were effective at attracting user attention.

155 Figure 3a shows average daily rating over time since the start of the rating period. The small amount
156 of data available at the start of the rating period accounts for the large variance in the beginning
157 of the graph. We can see that average daily rating fluctuates between 2.5 and 3.0 for the majority



(a) Graph of rating over time, with Generalized Additive Model (GAM) fit line, Localized Linear Regression (LLR) fit line, and average rating for each day. (b) Number of ratings submitted over entire competition. Spikes around March and July are caused by Amazon Events.

Figure 3: Graphs of user rating and number of daily ratings.

158 of the competition, peaking intermittently above 3.0 but below 3.5 in the first half of June and the
 159 first weeks of August. We also observe a steady increase in total average rating over the course of
 160 the competition, rising relatively swiftly from the start of May to mid-June, dipping briefly, then
 161 increasing slowly again starting in early July. While the steady increase in total average rating may
 162 be accounted for by a steady increase in the quality of the chat-bot (i.e. removal of bugs, granular
 163 changes according to usage data), we believe that the addition of different modules has also had an
 164 effect.

165 In particular, we observed several trends of improvement in performance as we gradually adjust and
 166 add different types of modules.

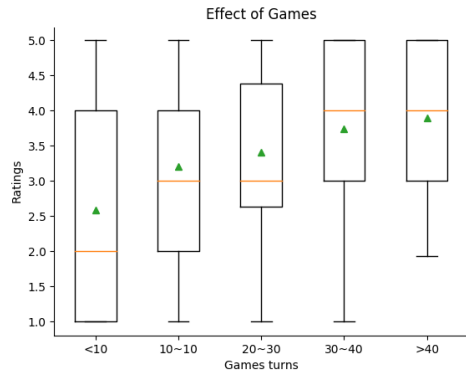


Figure 4: Effect of game modules by its usage of each session from July 1st to July 23rd

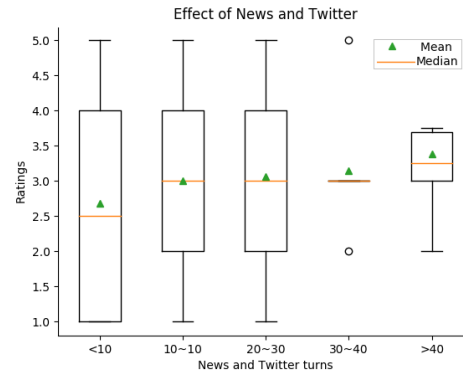


Figure 5: Effect of news modules by its usage of each session from July 1st to July 23rd

Table 4: Statistics on average rating in period indicated show effect of various game additions throughout whole competition.

Improvement	Word Game(I)	Text Adventure(II)	Riddle(III)	Gamification*(IV)
Period	04-10~05-19	05-19~07-17	07-17~08-10	after 08-10
Score±Std	2.71± 1.55	2.77±1.50	3.03± 1.49	3.17± 1.55
Comparison	I-II	II-III	III-IV	I-IV
t	-1.43	-9.77	-3.82	-8.44
p	.15	<.01	<.01	<.01
Effect size	-0.04	-0.17	-0.10	-0.30

*Gamification also includes addition of Ghost Adventure

167 **3.2 Effect of adding game modules**

168 As the game’s modules are added gradually, we compared user’s evaluation before and after adding
 169 each game. As shown in Table 4, in most cases adding a game did not result in a significant increase
 170 in user’s ratings in every addition of a new game. However, as seen in Figure 4, those people who
 171 play more games would give a higher rating. We believe this may be caused by niche users who
 172 just love games. Those mixed results inspired us to experiment further into using games for overall
 173 dialogue control. Unfortunately, this experiment did not receive our desired results. As shown in
 174 Figure 3a, after adding gamification which is on 10th Aug, our overall rating is lowered significantly
 175 and then recovered. This could be due to a number of factors. The game’s instructions and reward
 176 mechanism may not be clear enough to users. The overall game play may be too long. The game
 177 can easily take 20 minutes, which makes it time consuming to many users who just want to short
 178 chat. In addition, some of the users may not expect game as a form of conversation at all. We still
 179 believe gamifying the conversational experience has an intrinsic value, and plan to explore more in
 180 this direction in our future work.

Table 5: Statistics on average rating effect for various news improvements throughout whole competi-
 tion

Improvement*	Old source(I)	New source(II)	Comment(III)	TF (IV)	Twitter(V)	Gamify(VI)
Period	04-10~05-15	05-15~06-30	06-30~07-23	07-23~07-29	07-29~08-10	after 08-10
Score±Std	2.57± 1.52	2.76±1.52	2.83± 1.45	2.93± 1.49	3.20± 1.50	3.10± 1.51
Comparison	I-II	II-III	III-IV	IV-V	V-VI	I-VI
t	-2.70	-2.06	-2.03	-4.94	0.74	-7.55
p	<.01	<.01	=.04	<.01	=.46	<.01
Effect size	-0.13	-0.04	-0.07	-0.19	0.02	-0.39

*Old source: Washington Post, New Source: NewsAPI, Comment: Reddit comment, TF: Term Frequency

181 **3.3 Effect of adjusting news modules**

182 In Figure 5 we cannot observe a strong correlation between news turns and overall ratings. However,
 183 as we make the news modules cover more content and provide comments from social media, user
 184 ratings have improved significantly, as seen in Table 5. Further analysis of the p-value difference also
 185 validates this conclusion. Except for the last gamification step that causes has been mentioned in
 186 section above, p-value and t-value for each other news improvement indicates that adding more news
 187 content contributed significantly to the improvement of ratings. Other interesting results include that
 188 expanding news coverage in II and V increased score more comparing to other improvements and the
 189 distribution of users’ ratings changes dramatically in V. Such tendency implied that users consistently
 190 require an increasing coverage of new information.

191 **3.4 Effect of different dialogue manager**

Table 6: Statistics on average rating effect for different dialogue manager

Improvement	Menu Based(I)	Topic Based(II)	Gamify(III)
Period	04-10~07-01	07-01~08-10	after 08-10
Score±Std	2.76± 1.52	2.93±1.48	3.10± 1.52
Comparison	I-II	II-III	I-III
t	-7.99	-3.17	-6.28
p	<.01	<.01	<.01
Effect size	-0.11	-0.16	-0.27

¹All T test in this article are two-sided test for the null hypothesis that 2 independent samples have identical average (expected) values. This test assumes that the populations have identical variances by default.

192 In Table 6 we can see that the topic based dialogue manager significantly outperforms the menu based
 193 dialogue manager. We can also see gamification and the addition of narrative in the conversation
 194 further increased average score by a huge margin. As future research, we will add more chat
 195 functionality to the main NPC which enables it to guide users through the meta-game, and also give
 196 users the choice to talk only to one NPC who has every modules' functionality if they prefer not to
 197 play the meta-game.

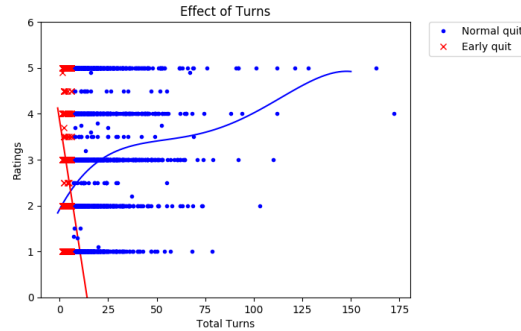


Figure 6: Effect of number of turns of each session, regression with 3 dimension fit for normal quit, regression with 1 dimension for early quit. We use data from July 1st to July 23rd

198 3.5 User Characteristics

199 Because we were restricted in collecting user information, it is hard to establish relationships between
 200 user characteristics and their ratings. Nevertheless, we were able to make two useful observations.

201 Many users left the conversation in five or less rounds of interaction. We call this phenomenon
 202 "early quit," as illustrated in Figure 6. Our results show that early quit, in general, does not affect
 203 users' rating. When the user interacts with the bot, typically the longer the interaction is, the higher
 204 the overall rating is. This is understandable as longer conversations provide user more chances of
 205 appreciating the bot's design. Combining this finding with the effect of interacting with the game
 206 modules inspired us to develop the idea of using a large scale narrative game to direct the conversation.

Table 7: Statistics on user Swearing effect for overall ratings since the start of semi final

Users	Swearing Users(I)	Normal Users(II)
Score±std	2.63± 1.36	2.93±1.49
Number of Users	1611	3175
Comparison I-II	t-value: 6.71	p-value: <.01

207 Some users attempted to either goad the bot to test the limits of what inappropriate language the bot
 208 would respond to or express disappointment and irritation to our chat-bot. Our results indicate that in
 209 general the users who used swear words scored the bot lower than those who did not, as shown in
 210 Table 7, which makes swearing words good indicator to identify bugs and design defects.

211 4 Conclusion

212 In this work, we showed two-layered dialogue framework are effective and flexible. Developers can
 213 add modules iteratively and test different type of dialogue managers without hurting user experience.
 214 This work also illustrated the importance of games and news modules which can significantly improve
 215 conversation quality without sophisticated methods. Further more, we also showed that gamification
 216 of conversation that uses an engaging story and game mechanics to bind unrelated individual modules
 217 is not only viable but entertaining.

218 References

- 219 [1] Steve Worswick. Mitsuku chatbot, 2016. URL <http://www.mitsuku.com/>.
- 220 [2] Armin Ronacher. Flask, 2017. URL <https://github.com/pallets/flask>.
- 221 [3] Oriol Vinyals and Quoc Le. A neural conversational model. *arXiv preprint arXiv:1506.05869*,
222 2015.
- 223 [4] Jiri Roznovjak. Question-answer jokes, 2017. URL [https://www.kaggle.com/jiroz/](https://www.kaggle.com/jiroz/qa-jokes)
224 [qa-jokes](https://www.kaggle.com/jiroz/qa-jokes).
- 225 [5] News api. URL <https://newsapi.org/>.
- 226 [6] Jenny Rose Finkel, Trond Grenager, and Christopher Manning. Incorporating non-local in-
227 formation into information extraction systems by gibbs sampling. In *Proceedings of the 43rd*
228 *annual meeting on association for computational linguistics*, pages 363–370. Association for
229 Computational Linguistics, 2005.
- 230 [7] Federico Barrios, Federico López, Luis Argerich, and Rosa Wachenchauzer. Variations of the
231 similarity function of textrank for automated summarization. *arXiv preprint arXiv:1602.03606*,
232 2016.
- 233 [8] Matthew Honnibal, Mark Johnson, et al. An improved non-monotonic transition system for
234 dependency parsing. In *EMNLP*, pages 1373–1378, 2015.
- 235 [9] Joshua Roesslein. Tweepy: Twitter for python. URL [https://github.com/tweepy/](https://github.com/tweepy/tweepy/tree/v3.5.0)
236 [tweepy/tree/v3.5.0](https://github.com/tweepy/tweepy/tree/v3.5.0).
- 237 [10] Bryce Boe. Praw: The python reddit api wrapper, 2016. URL [https://github.com/](https://github.com/praw-dev/praw)
238 [praw-dev/praw](https://github.com/praw-dev/praw).
- 239 [11] SEKI Yohei. Sentence extraction by tf/idf and position weighting from newspaper. In *Proceed-*
240 *ings of the Third NTCIR Workshop*, 2003.
- 241 [12] Amazon. Speechcon reference (interjections), 2017. URL [https://developer.amazon.](https://developer.amazon.com/public/solutions/alexa/alexa-skills-kit/docs/speechcon-reference)
242 [com/public/solutions/alexa/alexa-skills-kit/docs/speechcon-reference](https://developer.amazon.com/public/solutions/alexa/alexa-skills-kit/docs/speechcon-reference).
- 243 [13] Amazon. Speech synthesis markup language (ssml) reference, 2016. URL
244 [https://developer.amazon.com/public/solutions/alexa/alexa-skills-kit/](https://developer.amazon.com/public/solutions/alexa/alexa-skills-kit/docs/speech-synthesis-markup-language-ssml-reference)
245 [docs/speech-synthesis-markup-language-ssml-reference](https://developer.amazon.com/public/solutions/alexa/alexa-skills-kit/docs/speech-synthesis-markup-language-ssml-reference).
- 246 [14] Derba Wise. *Great Big Book of Children’s Games*. McGraw Hill Professional, 2003.
- 247 [15] Cort Stratton. Pyaiml – the python aiml interpreter, 2012. URL [https://github.com/](https://github.com/creatorrr/pyAIML)
248 [creatorrr/pyAIML](https://github.com/creatorrr/pyAIML).
- 249 [16] Ilya Sutskever, Oriol Vinyals, and Quoc V Le. Sequence to sequence learning with neural
250 networks. In *Advances in neural information processing systems*, pages 3104–3112, 2014.
- 251 [17] Marsan Ma. Chat corpus repository, 2016. URL [https://github.com/Marsan-Ma/chat_](https://github.com/Marsan-Ma/chat_corpus/)
252 [corpus/](https://github.com/Marsan-Ma/chat_corpus/).
- 253 [18] Sepp Hochreiter and Jürgen Schmidhuber. Long short-term memory. *Neural computation*, 9(8):
254 1735–1780, 1997.
- 255 [19] Daniel Jurafsky and James H Martin. Speech and language processing: An introduction to
256 natural language processing, computational linguistics, and speech recognition.
- 257 [20] Jemma Looyestyn, Jocelyn Kernot, Kobie Boshoff, Jillian Ryan, Sarah Edney, and Carol Maher.
258 Does gamification increase engagement with online programs? a systematic review. *PloS one*,
259 12(3):e0173403, 2017.

260 A Current Module Interaction Samples

261 2

²All Interaction Samples are generated by authors’ interaction with the Chatbot

Table 8: List of Sample Interaction

Name	Interaction
Joke	User: Tell me a joke Bot: Where does a two dimensional man live? User: have no idea Bot: A flat.
Reddit Search	Bot: Alright, go ahead and tell me a topic that we can discuss. User: Illinois Bot: I heard something related to that from fox2now yesterday . Illinois State Senate passes measure designating neo-Nazi groups as terrorists . Do you think that's a good issue to discuss? User: Well I don't have any opinion for it. Bot: Want to hear what else they have to say? Yes, or no? User: Yes Bot: I hate Illinois Nazis, 4464 people stand up and applaud in agreement.
Twitter Search	Bot: Go ahead and tell me the topic you want to hear about. User: North Korea Bot: I heard a story about that from NPR yesterday. North Korea Says It Won't Fire Missiles At Guam, After All . Do you think that's a good issue to discuss? User: Well I don't have any opinion for it. Bot: Want to hear what people are tweeting about that? User: Yes Bot: Here's a tweet favored by 6 people. Awaiting for Putin to call in another distraction from TrumpRussia investigation
Twitter Trend	Bot: Do you want me to talk about the top trending hashtags on twitter, or would you rather tell me a topic to focus on? User: I want to hear top trendings Bot: Okay!, this tag, " scientologytheaftermath, is pretty popular. Want to hear a tweet from it? User: Yes Bot: Great! Here's a tweet favored by 7090 people. Your support has made it possible for more people to come forward We thank you scientologytheaftermath . Want to hear a tweet from it? User: No
AIMLbot	Bot: How are you doing today? User: I'm not doing so well. Bot: Oh, I'm sorry to hear that. Hopefully I can make your day a bit brighter.
Chitchat	User: how are you? Bot: i am in NYC User: you live in New York Bot: i wish i could be there
Horoscope	Bot: Tell me what is your sign. If you want to figure out your sign, just say help. User: help Bot: tell me which month were you born in? User: October Bot: and which day in this month were you born? User: the twenty-fourth Bot: if your birthday is October the twenty-fourth, then you sign should be Scorpio. (horoscope) and would you like to know your match or rating? User: both Bot: (matches and ratings)
Riddle	Bot: Let's solve some riddles, answers will be just one word. What has a neck but no head? User: I don't know Bot: Ok, the answer is bottle, there's a neck to a bottle, but no head. If two's company and three's a crowd, what are four and five? User: nine. Bot: Correct! ... (more riddles)
Text Adventure Ghost Adventure Word Game Message Board	Descriptions for those modules have insufficient space to include, will be release on our website: http://dk00000000.github.io/wise_macaw/index.html