

Chat bot for booking cinema tickets

NLP \ Dr. Esraa

Amr Khaled 205015 , Nardeen Hesham 205074, Mohamed Farouk 205011

Abstract

The system utilizes natural language processing and a pre-trained deep learning model to understand user queries and provide accurate responses. By automating tasks such as checking ticket availability and providing pricing information, the chatbot streamlines the ticketing process and enhances user experience. The implementation demonstrates high accuracy in understanding user intent and positive user feedback regarding usability and convenience. The chatbot provides a user-friendly and interactive platform where users can effortlessly explore movie listings, check showtimes, select seats, and complete their ticket bookings through a conversational interface.

Introduction

The chatbot utilizes advanced technologies to streamline the ticket booking process and enhance user experience. By automating tasks and offering real-time assistance, the chatbot aims to simplify ticketing and improve customer satisfaction. The paper explores the development and evaluation of the chatbot system, highlighting its potential to optimize ticketing operations in the cinema industry.

Methodology

The methodology involved in developing the cinema ticket reservation chatbot system consisted of several key steps. These steps included collecting a dataset of various intents which is stored in the json file related to ticketing, employing natural language processing techniques for tokenizing and lemmatizing user

queries, training a deep learning model using the dataset, classifying user intents based on the trained model's predictions, and generating appropriate responses from predefined options. This methodology simplified the development process and ensured accurate intent classification and response generation.

The dataset

```
{} intents.json X
chatbot > Include > {} intents.json > {} intents > {} 0
1  {
2      "intents": [
3          {
4              "tag": "greeting",
5              "patterns": ["hi", "Hi there", "How are you", "Is anyone there?", "Hey", "Hola", "Hello", "Good day"],
6              "responses": ["Hello , i'm at your service", "Hi there, how can I help?", "Hi , this is galaxy cinema bot"],
7              "context": [""]
8          },
9
10         {
11             "tag": "cinema_location",
12             "patterns": ["view the cinema", "where is the cinema", "see the cinema", "cinema location"],
13             "responses": ["you can visit our cinema at : https://www.festivalcitymallcairo.com/home/whats-inside/entertainment/Galaxy+Cinema"],
14             "context": ["location"]
15         },
16         {
17             "tag": "goodbye",
18             "patterns": ["Bye", "See you later", "Goodbye", "Nice chatting to you, bye", "Till next time"],
19             "responses": ["See you!", "Have a nice day", "Bye! Come back again soon."],
20             "context": [""]
21         },
22         {
23             "tag": "thanks",
24             "patterns": ["Thanks", "Thank you", "That's helpful", "Awesome, thanks", "Thanks for helping me"],
25             "responses": ["My pleasure", "You're welcome"],
26             "context": [""]
27         },
28         {
29             "tag": "cancel_booking",
30             "patterns": ["cancel", "Can I cancel my movie ticket?", "How can I get a refund?", "refund", "Cancel"],
31
32 {} intents.json •
chatbot > Include > {} intents.json > {} intents > {} 10 > {} patterns > {} 4
33     {
34         "tag": "cancel_booking",
35         "patterns": ["cancel", "Can I cancel my movie ticket?", "How can I get a refund?", "refund", "Cancel"],
36         "responses": ["I understand. To assist you with the cancellation type your transaction code then cancel , to get your refund "],
37         "context": ["booking"]
38     },
39     {
40         "tag": "confrim_cancelation",
41         "patterns": ["123456 cancel", "cancel 123456 ticket", "cancel my 123456 ticket"],
42         "responses": ["your ticket has been canceled "],
43         "context": ["booking"]
44     },
45     {
46         "tag": "movies_list",
47         "patterns": ["What movies are currently playing?", "Can you give me a list of movies?", "Which movies are showing today?",
48             "Show me the available movies", "show me", "i want to book a ticket"],
49         "responses": ["Here are some of the movies currently playing:\n fast x , gaurdians of the galaxy3 , evil dead. \nPlease let me know if you would li"],
50         "context": [""]
51     },
52     {
53         "tag": "ticket_reservation",
54         "patterns": ["i want 2 tickets for fast x ,gaurdians of the galaxy3 , evil dead,", "fast x ", "gaurdians of the galaxy3 ",
55             "evil dead at 12pm", "i ticket for fast x , gaurdians of the galaxy3 , evil dead at 8pm",
56             "fast x , gaurdians of the galaxy3 , evil dead movie at 4pm", "the fast x , gaurdians of the galaxy3 , evil dead at 1pm"],
57         "responses": ["Let me check that for you. Please provide me with your seat place, near or far from the screen?"],
58         "context": ["booking"]
59     },
60     {
61         "tag": "cancel_booking",
62         "patterns": ["cancel", "Can I cancel my movie ticket?", "How can I get a refund?", "refund", "Cancel"],
63         "responses": ["I understand. To assist you with the cancellation type your transaction code then cancel , to get your refund "],
64         "context": ["booking"]
65     },
66     {
67         "tag": "confrim_cancelation",
68         "patterns": ["123456 cancel", "cancel 123456 ticket", "cancel my 123456 ticket"],
69         "responses": ["your ticket has been canceled "],
70         "context": ["booking"]
71     },
72     {
73         "tag": "movies_list",
74         "patterns": ["What movies are currently playing?", "Can you give me a list of movies?", "Which movies are showing today?",
75             "Show me the available movies", "show me", "i want to book a ticket"],
76         "responses": ["Here are some of the movies currently playing:\n fast x , gaurdians of the galaxy3 , evil dead. \nPlease let me know if you would li"],
77         "context": [""]
78     },
79     {
80         "tag": "ticket_reservation",
81         "patterns": ["i want 2 tickets for fast x ,gaurdians of the galaxy3 , evil dead,", "fast x ", "gaurdians of the galaxy3 ",
82             "evil dead at 12pm", "i ticket for fast x , gaurdians of the galaxy3 , evil dead at 8pm",
83             "fast x , gaurdians of the galaxy3 , evil dead movie at 4pm", "the fast x , gaurdians of the galaxy3 , evil dead at 1pm"],
84         "responses": ["Let me check that for you. Please provide me with your seat place, near or far from the screen?"],
85         "context": ["booking"]
86     },
87     {
88         "tag": "cancel_booking",
89         "patterns": ["cancel", "Can I cancel my movie ticket?", "How can I get a refund?", "refund", "Cancel"],
90         "responses": ["I understand. To assist you with the cancellation type your transaction code then cancel , to get your refund "],
91         "context": ["booking"]
92     },
93     {
94         "tag": "confrim_cancelation",
95         "patterns": ["123456 cancel", "cancel 123456 ticket", "cancel my 123456 ticket"],
96         "responses": ["your ticket has been canceled "],
97         "context": ["booking"]
98     },
99     {
100        "tag": "movies_list",
101        "patterns": ["What movies are currently playing?", "Can you give me a list of movies?", "Which movies are showing today?",
102            "Show me the available movies", "show me", "i want to book a ticket"],
103        "responses": ["Here are some of the movies currently playing:\n fast x , gaurdians of the galaxy3 , evil dead. \nPlease let me know if you would li"],
104        "context": [""]
105    },
106    {
107        "tag": "ticket_reservation",
108        "patterns": ["i want 2 tickets for fast x ,gaurdians of the galaxy3 , evil dead,", "fast x ", "gaurdians of the galaxy3 ",
109            "evil dead at 12pm", "i ticket for fast x , gaurdians of the galaxy3 , evil dead at 8pm",
110            "fast x , gaurdians of the galaxy3 , evil dead movie at 4pm", "the fast x , gaurdians of the galaxy3 , evil dead at 1pm"],
111        "responses": ["Let me check that for you. Please provide me with your seat place, near or far from the screen?"],
112        "context": ["booking"]
113    },
114    {
115        "tag": "cancel_booking",
116        "patterns": ["cancel", "Can I cancel my movie ticket?", "How can I get a refund?", "refund", "Cancel"],
117        "responses": ["I understand. To assist you with the cancellation type your transaction code then cancel , to get your refund "],
118        "context": ["booking"]
119    },
120    {
121        "tag": "confrim_cancelation",
122        "patterns": ["123456 cancel", "cancel 123456 ticket", "cancel my 123456 ticket"],
123        "responses": ["your ticket has been canceled "],
124        "context": ["booking"]
125    },
126    {
127        "tag": "movies_list",
128        "patterns": ["What movies are currently playing?", "Can you give me a list of movies?", "Which movies are showing today?",
129            "Show me the available movies", "show me", "i want to book a ticket"],
130        "responses": ["Here are some of the movies currently playing:\n fast x , gaurdians of the galaxy3 , evil dead. \nPlease let me know if you would li"],
131        "context": [""]
132    },
133    {
134        "tag": "ticket_reservation",
135        "patterns": ["i want 2 tickets for fast x ,gaurdians of the galaxy3 , evil dead,", "fast x ", "gaurdians of the galaxy3 ",
136            "evil dead at 12pm", "i ticket for fast x , gaurdians of the galaxy3 , evil dead at 8pm",
137            "fast x , gaurdians of the galaxy3 , evil dead movie at 4pm", "the fast x , gaurdians of the galaxy3 , evil dead at 1pm"],
138        "responses": ["Let me check that for you. Please provide me with your seat place, near or far from the screen?"],
139        "context": ["booking"]
140    },
141    {
142        "tag": "cancel_booking",
143        "patterns": ["cancel", "Can I cancel my movie ticket?", "How can I get a refund?", "refund", "Cancel"],
144        "responses": ["I understand. To assist you with the cancellation type your transaction code then cancel , to get your refund "],
145        "context": ["booking"]
146    },
147    {
148        "tag": "confrim_cancelation",
149        "patterns": ["123456 cancel", "cancel 123456 ticket", "cancel my 123456 ticket"],
150        "responses": ["your ticket has been canceled "],
151        "context": ["booking"]
152    },
153    {
154        "tag": "movies_list",
155        "patterns": ["What movies are currently playing?", "Can you give me a list of movies?", "Which movies are showing today?",
156            "Show me the available movies", "show me", "i want to book a ticket"],
157        "responses": ["Here are some of the movies currently playing:\n fast x , gaurdians of the galaxy3 , evil dead. \nPlease let me know if you would li"],
158        "context": [""]
159    },
160    {
161        "tag": "ticket_reservation",
162        "patterns": ["i want 2 tickets for fast x ,gaurdians of the galaxy3 , evil dead,", "fast x ", "gaurdians of the galaxy3 ",
163            "evil dead at 12pm", "i ticket for fast x , gaurdians of the galaxy3 , evil dead at 8pm",
164            "fast x , gaurdians of the galaxy3 , evil dead movie at 4pm", "the fast x , gaurdians of the galaxy3 , evil dead at 1pm"],
165        "responses": ["Let me check that for you. Please provide me with your seat place, near or far from the screen?"],
166        "context": ["booking"]
167    },
168    {
169        "tag": "cancel_booking",
170        "patterns": ["cancel", "Can I cancel my movie ticket?", "How can I get a refund?", "refund", "Cancel"],
171        "responses": ["I understand. To assist you with the cancellation type your transaction code then cancel , to get your refund "],
172        "context": ["booking"]
173    },
174    {
175        "tag": "confrim_cancelation",
176        "patterns": ["123456 cancel", "cancel 123456 ticket", "cancel my 123456 ticket"],
177        "responses": ["your ticket has been canceled "],
178        "context": ["booking"]
179    },
180    {
181        "tag": "movies_list",
182        "patterns": ["What movies are currently playing?", "Can you give me a list of movies?", "Which movies are showing today?",
183            "Show me the available movies", "show me", "i want to book a ticket"],
184        "responses": ["Here are some of the movies currently playing:\n fast x , gaurdians of the galaxy3 , evil dead. \nPlease let me know if you would li"],
185        "context": [""]
186    },
187    {
188        "tag": "ticket_reservation",
189        "patterns": ["i want 2 tickets for fast x ,gaurdians of the galaxy3 , evil dead,", "fast x ", "gaurdians of the galaxy3 ",
190            "evil dead at 12pm", "i ticket for fast x , gaurdians of the galaxy3 , evil dead at 8pm",
191            "fast x , gaurdians of the galaxy3 , evil dead movie at 4pm", "the fast x , gaurdians of the galaxy3 , evil dead at 1pm"],
192        "responses": ["Let me check that for you. Please provide me with your seat place, near or far from the screen?"],
193        "context": ["booking"]
194    },
195    {
196        "tag": "cancel_booking",
197        "patterns": ["cancel", "Can I cancel my movie ticket?", "How can I get a refund?", "refund", "Cancel"],
198        "responses": ["I understand. To assist you with the cancellation type your transaction code then cancel , to get your refund "],
199        "context": ["booking"]
200    },
201    {
202        "tag": "confrim_cancelation",
203        "patterns": ["123456 cancel", "cancel 123456 ticket", "cancel my 123456 ticket"],
204        "responses": ["your ticket has been canceled "],
205        "context": ["booking"]
206    },
207    {
208        "tag": "movies_list",
209        "patterns": ["What movies are currently playing?", "Can you give me a list of movies?", "Which movies are showing today?",
210            "Show me the available movies", "show me", "i want to book a ticket"],
211        "responses": ["Here are some of the movies currently playing:\n fast x , gaurdians of the galaxy3 , evil dead. \nPlease let me know if you would li"],
212        "context": [""]
213    },
214    {
215        "tag": "ticket_reservation",
216        "patterns": ["i want 2 tickets for fast x ,gaurdians of the galaxy3 , evil dead,", "fast x ", "gaurdians of the galaxy3 ",
217            "evil dead at 12pm", "i ticket for fast x , gaurdians of the galaxy3 , evil dead at 8pm",
218            "fast x , gaurdians of the galaxy3 , evil dead movie at 4pm", "the fast x , gaurdians of the galaxy3 , evil
```

```

() intents.json •
chatbot > Include > {} intents.json > {} intents > {} 10 > {} patterns > 4
56 {
57   "tag": "seat_selection",
58   "patterns": ["near", "far", "i want one or two seats near the screen", "i want one or two seats far the screen", "near the screen",
59     "far from the screen"],
60   "responses": ["Let me check that for you, the available seats are near the screen for now , \ndo you want to confirm the ticket?"],
61   "context": ["booking"]
62 },
63 {
64   "tag": "confirm_ticket",
65   "patterns": ["yes", "paypal", "fawry", "mastercard", "miza", "visa", "Confirm my ticket", "confirm", "Am I booked for the movie?",
66     "Is my ticket confirmed?", "Has my booking been confirmed?"],
67   "responses": ["to confirm your ticket please pay the ticket fee which is 120EGP with fawry or paypal to the number 123456789 ,\nsend the transaction"],
68   "context": ["booking"]
69 },
70 {
71   "tag": "payment",
72   "patterns": ["how can i book my ticket", "payment", "How do I pay for the tickets?", "What payment methods are accepted?",
73     "Is online payment available?"],
74   "responses": ["We accept various payment methods, including credit cards, debit cards, and online payment systems to the number 123456789. You can"],
75   "context": ["booking"]
76 },
77 {
78   "tag": "transaction code",
79   "patterns": ["the code is 123456", "the transaction code is 123456", "here is the transaction code : 123456"],
80   "responses": ["the transaction is valid , your ticket numbers are: 1025 , you can recieve it at the cinema ticket window"],
81   "context": ["booking"]
82 }
83 ]

```

Training model

Now we train a neural network model for a chatbot using intents and patterns stored in the previous JSON file. It applies nlp techniques, prepares the data, builds the model, and saves it for further use

```

1  import random
2  import json
3  import pickle
4  import numpy as np
5  import tensorflow as tf
6
7  import nltk
8  nltk.download('punkt')
9  nltk.download('wordnet')
10 from nltk.stem import WordNetLemmatizer
11
12 lemmatizer = WordNetLemmatizer()
13
14 intents = json.loads(open('C:/Users/medob/Desktop/chatbot/chatbot/Include/intents.json').read())
15
16 words = []
17 classes = []
18 documents = []
19 ignoreLetters = ['?', '!', '.', ',']
20
21 for intent in intents['intents']:
22     for pattern in intent['patterns']:
23         wordList = nltk.word_tokenize(pattern)
24         words.extend(wordList)
25         documents.append((wordList, intent['tag']))
26         if intent['tag'] not in classes:
27             classes.append(intent['tag'])
28
29 words = [lemmatizer.lemmatize(word) for word in words if word not in ignoreLetters]
30 words = sorted(set(words))
31
32 classes = sorted(set(classes))

```

```

33
34 pickle.dump(words, open('words.pkl', 'wb'))
35 pickle.dump(classes, open('classes.pkl', 'wb'))
36
37 training = []
38 outputEmpty = [0] * len(classes)
39
40 for document in documents:
41     bag = []
42     wordPatterns = document[0]
43     wordPatterns = [lemmatizer.lemmatize(word.lower()) for word in wordPatterns]
44     for word in words:
45         bag.append(1) if word in wordPatterns else bag.append(0)
46
47     outputRow = list(outputEmpty)
48     outputRow[classes.index(document[1])] = 1
49     training.append(bag + outputRow)
50
51 random.shuffle(training)
52 training = np.array(training)
53
54 trainX = training[:, :len(words)]
55 trainY = training[:, len(words):]
56
57
58 model = tf.keras.Sequential()
59 model.add(tf.keras.layers.Dense(128, input_shape=(len(trainX[0]),), activation = 'relu'))
60 model.add(tf.keras.layers.Dropout(0.5))
61 model.add(tf.keras.layers.Dense(64, activation = 'relu'))
62 model.add(tf.keras.layers.Dropout(0.5))
63 model.add(tf.keras.layers.Dense(len(trainY[0]), activation='softmax'))
64
64
65 sgd = tf.keras.optimizers.SGD(learning_rate=0.01, momentum=0.9, nesterov=True)
66 model.compile(loss='categorical_crossentropy', optimizer=sgd, metrics=['accuracy'])
67
68 hist = model.fit(np.array(trainX), np.array(trainY), epochs=200, batch_size=5, verbose=1)
69 model.save('chatbot_model.h5', hist)
70 print('Done')

```

Main code

Now we load the pre-trained chatbot model , then start asking the bot and it generates appropriate responses based on the trained model.

```
1  import random
2  import json
3  import pickle
4  import numpy as np
5  import nltk
6
7  from nltk.stem import WordNetLemmatizer
8  from keras.models import load_model
9
10 lemmatizer = WordNetLemmatizer()
11 intents = json.loads(open('C:/Users/medob/Desktop/chatbot/chatbot/Include/intents.json').read())
12
13 words = pickle.load(open('words.pkl', 'rb'))
14 classes = pickle.load(open('classes.pkl', 'rb'))
15 model = load_model('chatbot_model.h5')
16
17 def clean_up_sentence(sentence):
18     sentence_words = nltk.word_tokenize(sentence)
19     sentence_words = [lemmatizer.lemmatize(word) for word in sentence_words]
20     return sentence_words
21
22 def bag_of_words (sentence):
23     sentence_words = clean_up_sentence(sentence)
24     bag = [0] * len(words)
25     for w in sentence_words:
26         for i, word in enumerate(words):
27             if word == w:
28                 bag[i] = 1
29     return np.array(bag)
30
31 def predict_class (sentence):
32     bow = bag_of_words (sentence)
33
34     def predict_class (sentence):
35         bow = bag_of_words (sentence)
36         res = model.predict(np.array([bow]))[0]
37         ERROR_THRESHOLD = 0.25
38         results = [[i, r] for i, r in enumerate(res) if r > ERROR_THRESHOLD]
39
40         results.sort(key=lambda x: x[1], reverse=True)
41         return_list = []
42         for r in results:
43             return_list.append({'intent': classes [r[0]], 'probability': str(r[1])})
44         return return_list
45
46 def get_response(intents_list, intents_json):
47     tag = intents_list[0]['intent']
48     list_of_intents = intents_json['intents']
49     for i in list_of_intents:
50         if i['tag'] == tag:
51             result = random.choice (i['responses'])
52             break
53     return result
54
55 print("GO! Bot is running!")
56
57 while True:
58     message = input("")
59     ints = predict_class (message)
60     res = get_response (ints, intents)
61     print (res)
```