Hodor Chatbot

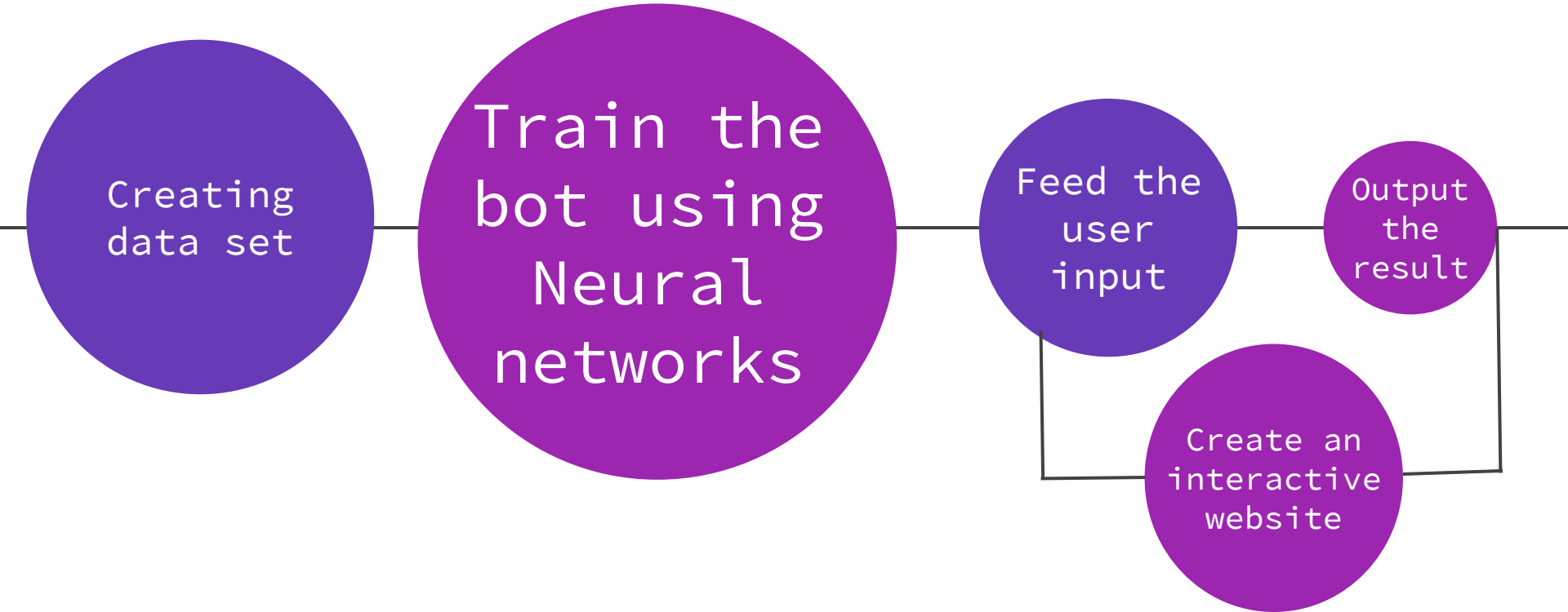
Chengshi Zhang, Paul Ngouchet, Sahil Sharma

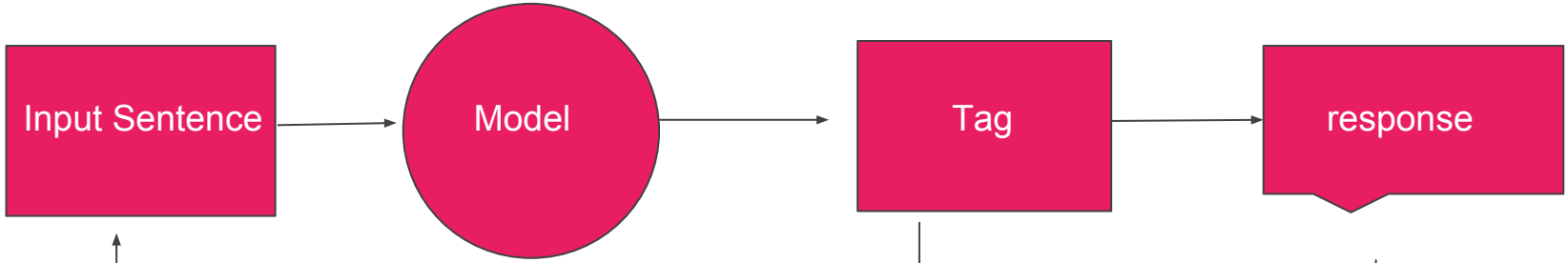
A chat-bot for Game Of Thrones Hotel enquiry

About the chatbot

Hodor is a Website based informative AI device that tries to answer a user’s input enquiries about different aspects of the hotel.

Process


Creating data set
Train the bot using Neural networks
Feed the user input
Output the result
Create an interactive website



“Greetings”

How are you?

I’m good Thank you

Working

Step 1

Creating Data Set

Sample Data

```
{"intents": [
        {"tag": "greeting",
         "patterns": ["Hi", "How are you", "Is anyone there?", "Hello", "Good day"],
         "responses": ["Hello, Welcome to Ice and Fire Hotel your grace!", "Warm welcome to Ice and Fire Hotel", "He
        },
        {"tag": "goodbye",
         "patterns": ["Bye", "See you later", "Goodbye"],
         "responses": ["See you later, thanks for visiting", "Ciao, Have a nice day", "Seven Blessings! Come back ag
        },
        {"tag": "thanks",
         "patterns": ["Thanks", "Thank you", "That's helpful"],
         "responses": ["Valar Dohaeris", "Any time!", "My pleasure"]
        },
        {"tag": "check-in",
         "patterns": ["What is your Check-in time?", "when can I check in?", "When are you open?", "what is the earl
         "responses": ["Check-in starts after 4pm through the day", "You are welcome to check in anytime after 4pm"]
        },
```

Step 2

Training the bot

How does the model find the Tag?

Training sample Input

Patterns => Sentences

- Hi
- Hello
- Good day
- Is anyone there
- How are you doing?

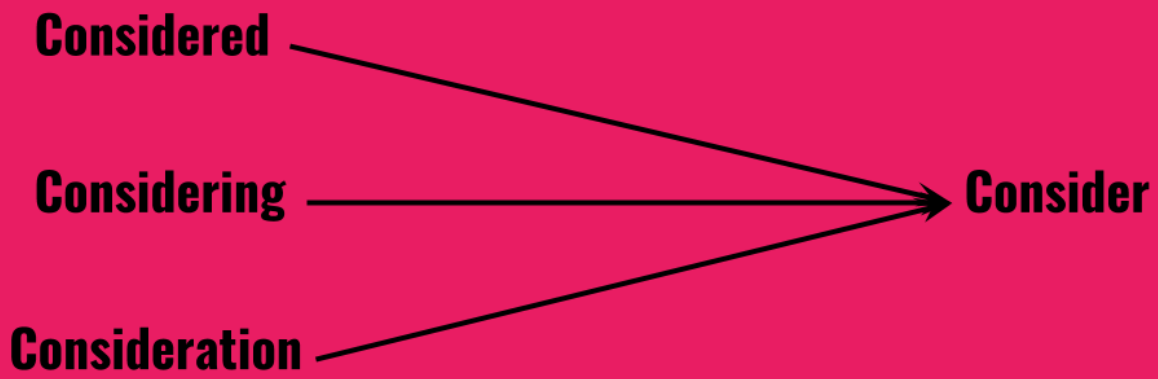
Training sample Label

Tags => Topic words

Greetings

– – –

Stemming Words



“How are you?”

about	0	earliest	0	last	0	reserv	0
acceiv	0	facil	0	lat	0	room	0
act	0	for	0	leav	0	see	0
am	0	from	0	lik	0	situ	0
amex	0	get	0	loc	0	spa	0
an	0	giv	0	mak	0	sport	0
any	0	good	0	many	0	standard	0
anyon	0	goodby	0	mastercard	0	suit	0
are	1	guy	0	me	0	tak	0
at	0	hav	0	mor	0	tel	0
book	0	heat	0	mov	0	than	0
bye	0	hello	0	my	0	thank	0
can	0	help	0	of	0	that	0
cancel	0	hi	0	on	0	the	0
card	0	hotel	0	op	0	there	0
cash	0	how	1	opt	0	tim	0
check	0	i	0	or	0	to	0
check-in	0	in	0	oth	0	vary	0
check-out	0	indo	0	outdo	0	view	0
credit	0	infin	0	pay	0	want	0
day	0	inform	0	policy	0	what	0
delux	0	is	0	pool	0	when	0
diff	0	kid	0	process	0	wher	0
do	0	kind	0	provid	0	which	0
doe	0	know	0	reserv	0	work	0
						you	1

“Greeting”

greeting	1
goodbye	0
thanks	0
check-in	0
check-out	0
room	0
multi_rooms	0
Deluxe	0
Standard	0
Suite	0
payments	0
reservation	0
cancellation	0
pool	0
spa	0
activities	0

Training Set

Input:

“How are you?”

```
[0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1]
```

Target Output:

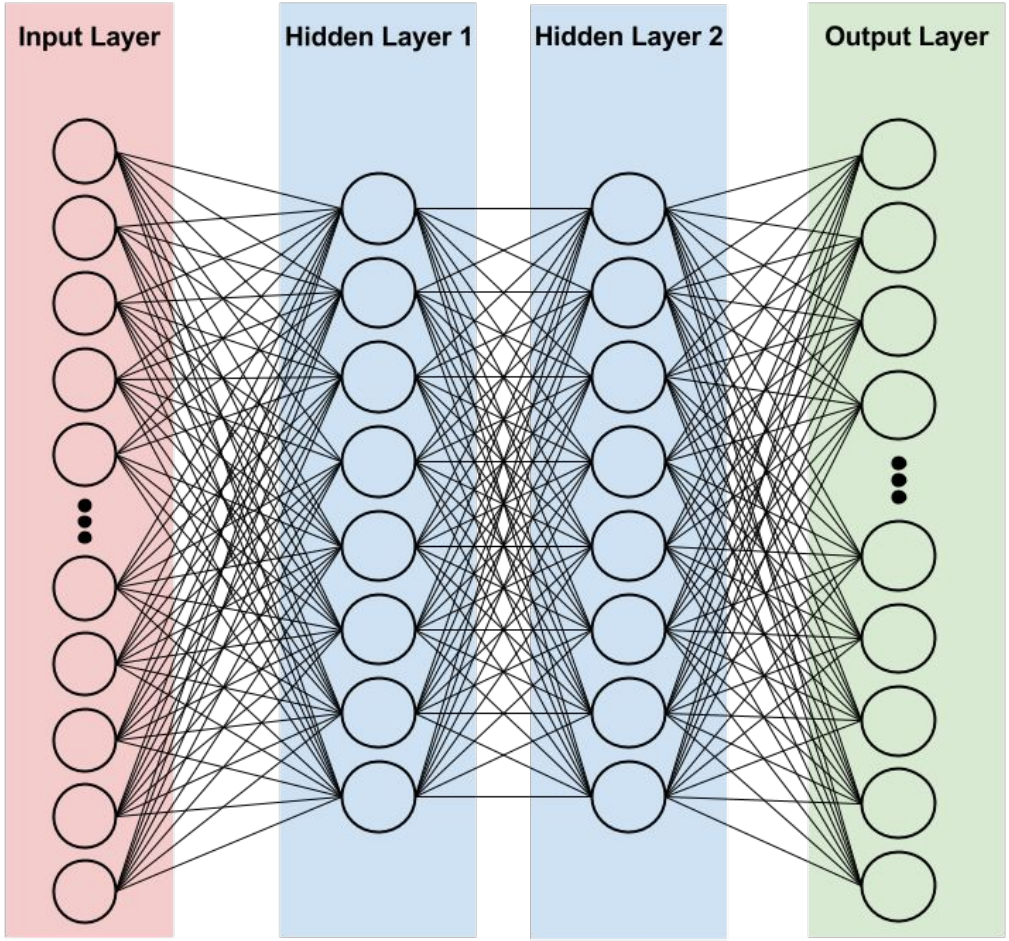
“greeting”

```
[1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0]
```

Feed Forward Neural Network

4 layers Deep Feed Forward NN using Tensorflow

Input layer = size of dictionary in the dataset , 2 hidden layers = 8 neurons each
Output layer = number of tags in the dataset


Input Layer
Hidden Layer 1
Hidden Layer 2
Output Layer

```
def init_weights(shape):
    return tf.Variable(tf.random_normal(shape, stddev=0.02))


def forward(X, W1, b1, W2, b2, W3, b3):
    Z1 = tf.nn.sigmoid(tf.matmul(X, W1) + b1)
    Z2 = tf.nn.sigmoid(tf.matmul(Z1, W2) + b2)
    return tf.matmul(Z2, W3) + b3


tfX = tf.placeholder(tf.float32, [None, D], name="input")
tfY = tf.placeholder(tf.float32, [None, K])

W1 = init_weights([D, M1]) # create symbolic variables
b1 = init_weights([M1])
W2 = init_weights([M1, M2])
b2 = init_weights([M2])
W3 = init_weights([M2, K])
b3 = init_weights([K])

logits = forward(tfX, W1, b1, W2, b2, W3, b3)

cost = tf.reduce_mean(
  tf.nn.softmax_cross_entropy_with_logits(
    labels=tfY,
    logits=logits
  )
)
train_op = tf.train.GradientDescentOptimizer(0.1).minimize(cost) # Building an optimizer
```

Step 3

Interfacing with the bot

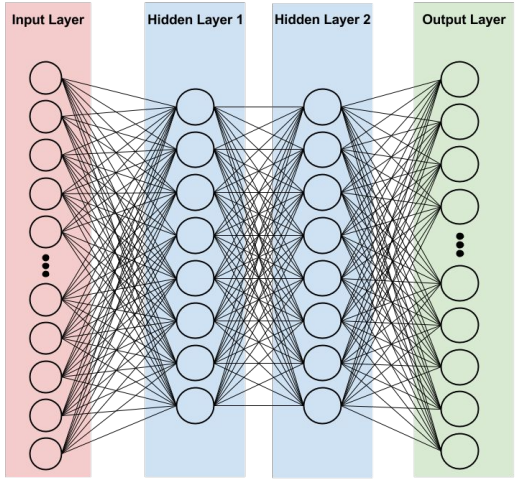
“How can I book a room?”

about	0	earliest	0	last	0	room	1
acceiv	0	facil	0	lat	0	see	0
act	0	for	0	leav	0	situ	0
am	0	from	0	lik	0	spa	0
amex	0	get	0	loc	0	sport	0
an	0	giv	0	mak	0	standard	0
any	0	good	0	many	0	suit	0
anyon	0	goodby	0	mastercard	0	tak	0
are	0	guy	0	me	0	tel	0
at	0	hav	0	mor	0	than	0
book	1	heat	0	mov	0	thank	0
bye	0	hello	0	my	0	that	0
can	1	help	0	of	0	the	0
cancel	0	hi	0	on	0	there	0
card	0	hotel	0	op	0	tim	0
cash	0	how	1	opt	0	to	0
check	0	i	1	or	0	vary	0
check-in	0	in	0	oth	0	view	0
check-out	0	indo	0	outdo	0	want	0
credit	0	infin	0	pay	0	what	0
day	0	inform	0	policy	0	when	0
delux	0	is	0	pool	0	wher	0
diff	0	kid	0	process	0	which	0
do	0	kind	0	provid	0	work	0
doe	0	know	0	reserv	0	you	0

Input → Neural Network → Output

"How can I book a room?"

```
[0 0 0 0 0 0 0 0 0 0 1
0 1 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 1 1 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 1 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0]
```



greeting	0.000000033%
goodbye	0.023677384%
thanks	0.000490057%
check-in	0.000001853%
check-out	0.000001815%
room	0.010469731%
multi_rooms	0.000245391%
Deluxe	0.000000033%
Standard	0.000000821%
Suite	0.000739000%
payments	0.000057690%
reservation	99.644982813%
cancellation	0.000836512%
pool	0.000000031%
spa	0.000000001%
activities	0.000000020%

```
42        {"tag": "payments",
43         "patterns": ["Do you take credit cards?", "Do you accept Mastercard?", "Are you cash only?" ,"Does Amex wo
44         "responses": ["We accept VISA, Mastercard and AMEX, since we are in direct contact with the Iron Bank", "W
45        },
46        {"tag": "reservation",
47          "patterns": ["How can I make a Reservation",  "I'd like to book a room", "how does reservation work?", "w
48          "responses": ["Click here to reserve online or call 9876543210"]
49        },
50        {"tag": "cancelation",
51          "patterns": ["can I cancel my reservation?", "what is your cancellation policy", "how do I cancel reserva
52          "responses": ["learn more about cancellations here(this is a link)"]
53        },
54        {"tag": "pool",
55         "patterns": ["Do you guys have a pool?", "Is there a pool in the hotel", "how many pools do you have?", "i
56         "responses": ["Ice and Fire Hotel has 3 pool an in-door pool, one outdoor all weather pool and one rooftop
57       },
58        {"tag": "spa",
59         "patterns": ["Do you guys have a spa?", "Do you provide spa facilities", "is spa an option at your hotel?"
60         "responses": ["Ice and Fire Hotel has indoor spa treatments and we mountain top Gazibo spa treatmenst as w
```

Step 4

Create a website as the interface

Website Design

MEAN STACK

Mongodb Expressjs Angularjs Nodejs Html Css Javascript

User Input → Saved Database → Run Python script → Call NN Model → Response → Saved Database → Display On website

Significance

Future


Service


FAQs
Frequently Asked Questions

- Restaurant
- Cafe
- Flights

- Enquiry (Bus stops)
- Information desks (amusement parks)

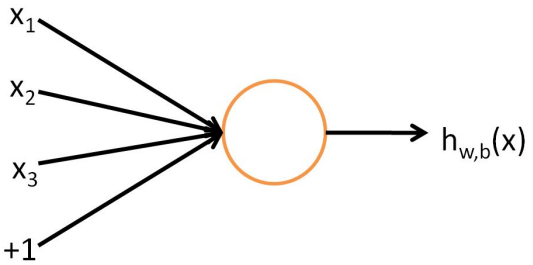
Improvements For this design

Bigger Dataset

Ability to automatically generate data

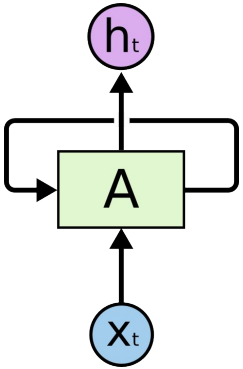
Cross Validation for a new design

New Design
ANN VS RNN



$H(t) = W_0' X$

vs



$H(t) = W_0' X + W'_h * H(t-1)$

Roles

Neural Network Design
Website Design

Paul Ngouchet

Chatbot Design
Website Design

Chengshi Zhang

Dataset Design
Chatbot Design

Sahil Sharma