Customer Service Text Generation Using Natural Language Processing

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Customer Service Now

- Long hold times
- Everyone has had a bad experience
- Have to repeat the issue at each level

A Solution

- Replace lowest tier of workers
- Smaller Customer Service teams
- Shorter wait time
- Potentially less churn

Implementation

- But aren't bots bad?
- Not everyone has the same issue
- People are more flexible
- What if the bot doesn't know the solution?

Natural Language Processing

- What is NLP?
- How can it help me?

How Does it Work?

- Advances in Computing Power
- Ridiculous amounts of Data (Big Data)
- What is it capable of?

Why is this important?

- Measure customer sentiment
- Parse large amounts of data, forms, etc.

Back to Customer Service

- This project
- Customer Service Tweet Data Set
- Text Generation

Example of Tweet Data Set

- 'Our teams are now reporting that this is resolved! Downloads should be working normally, so please feel free to giv… https://t.co/tFCW98UpyE',

- 'RT @MojangStatus: Minecraft Bedrock - iOS only: some players have said they can log in if they switched to cellular data. We are continuing…',

- 'We've heard that some of you are having trouble downloading purchased content. Our investigative teams are working… https://t.co/stMWzuHHtA',

- 'We just received word that users should now be able to access purchased content again. We appreciate your reports.… https://t.co/85Q9cr9IdE',

- 'We understand some of you are also having trouble accessing purchased content and in-game content on the Xbox One.… https://t.co/Bceb3MJiCd',

Word Cloud

Levels of Models

- Long time to train
- Mixed Results
- Varied Implementation

Best Model Results

```
In [27]: print(generate_text("why can't i see this page", 30, model, max_sequence_len))
```
executed in 200ms, finished 08:58:38 2020-01-22

Why Can'T I See This Page Is Not The Experience We Want You To Have You Can You Dm Me Your Full Name Home… Ad… Further… Look
Picture Of… 1 Planned And I 1 It

```
In [28]: print(generate_text("help", 30, model, max_sequence_len))
```
executed in 234ms, finished 08:58:50 2020-01-22

Help You Can You Dm Me Your Full Name Email Address Photos Of The Product Barcode Date Code And Sc… 1 5 2 31 Gt Tue 2 31 Gt
2

```
In [29]: print(generate_text("this is broken", 30, model, max_sequence_len))
```
executed in 208ms, finished 08:58:58 2020-01-22

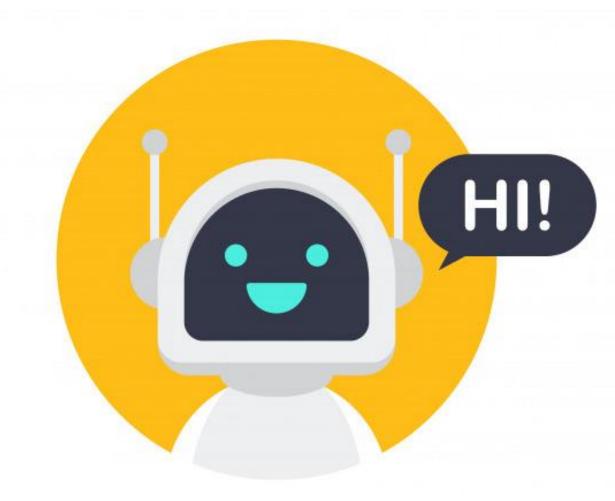This Is Broken Alcoholic We Want You To Have Paty Please Dm Us Your Full Name Email Address And E… Of… 1 2 2 2 2 2 Hours 2 1
Expe… Demand Vouchers

Attention/Transformer Models – Future Work

- GPT-2
- Future Models
- Very complex
- Computationally Expensive

Thoughts on Project Models

- Interesting but flawed
- Bigger Dataset might help
- Change parameters

Customer Service Bots

- The concept is there
- Needs better execution
- Needs to be more humanlike
- Speeds up customer service process

Takeaways and Conclusions

- NLP is incredible
- Many companies are already implementing NLP
- Thank You for listening
- Questions?