EXAM PROFESSIONAL MACHINE LEARNING ENGINEER TOPIC 1 QUESTION 112 DISCUSSI...

Actual exam question from Google's Professional Machine Learning Engineer
Question #: 112
Topic #: 1
[All Professional Machine Learning Engineer Questions]

You are an ML engineer in the contact center of a large enterprise. You need to build a sentiment analysis tool that predicts customer sentiment from recorded phone conversations. You need to identify the best approach to building a model while ensuring that the gender, age, and cultural differences of the customers who called the contact center do not impact any stage of the model development pipeline and results. What should you do?

A. Convert the speech to text and extract sentiments based on the sentences.

B. Convert the speech to text and build a model based on the words.

C. Extract sentiment directly from the voice recordings.

D. Convert the speech to text and extract sentiment using syntactical analysis.

Show Suggested Answer

by mil_spyro at *Dec. 13, 2022, 8:48 p.m.*

Comments

mymy9418 Highly Voted 1 year, 10 months ago

Selected Answer: A

Syntactic Analysis is not for sentiment analysis

upvoted 10 times

fitri001 Most Recent 6 months, 1 week ago

Selected Answer: A

A. Convert speech to text and extract sentiments based on sentences: This method focuses on the content of the conversation, minimizing the influence of factors like voice tone (which can be culturally or gender-specific). Sentiment analysis techniques can analyze the meaning and context of sentences to identify positive, negative, or neutral sentiment.

upvoted 4 times

fitri001 6 months, 1 week ago

B. Convert speech to text and build a model based on the words: While words are important, relying solely on them can miss the context and lead to bias. For example, "great" might be positive in most cases, but in some cultures, it might be used sarcastically.

C. Extract sentiment directly from voice recordings: This approach can be biased as voice characteristics like pitch or pace can vary based on gender, age, and cultural background.

D. Convert speech to text and extract sentiment using syntactical analysis: While syntax can provide some clues, it's not the strongest indicator of sentiment. Additionally, cultural differences in sentence structure could impact accuracy.

upvoted 2 times

RioGrande 11 months, 1 week ago

The correct answer should be A. Word embeddings have static embeddings for the same words, while contextual embeddings vary depending on the context.

"May's sentence embedding adaptation of WEAT, known as the Sentence Embedding Association Test (SEAT), shows less clear racial and gender bias in language models and embeddings than the corresponding word embedding formulation"

From: https://medium.com/institute-for-applied-computational-science/bias-in-nlp-embeddings-b1dabb8bbe20

upvoted 2 times

pico 11 months, 3 weeks ago

Selected Answer: B

This approach involves converting the speech to text, which allows you to analyze the content of the conversations without directly dealing with the speakers' gender, age, or cultural differences. By building a model based on the words, you can focus on the language used in the conversations to predict sentiment, making the model more inclusive and less sensitive to demographic factors.

Option A could be influenced by the syntactical nuances and structures used in different cultures, and option C might be impacted by the variations in voice tones across genders and ages. Option B, on the other hand, relies on the text content, which provides a more neutral and content-focused basis for sentiment analysis.

upvoted 2 times

MCorsetti 1 year ago

Selected Answer: B

B: People of different cultures will often use difference sentence structures, so words would be safer than sentences

upvoted 1 times

tavva_prudhvi 12 months ago

Yeah, but they(words) may miss the context of the sentiment, leading to inaccuracies!

upvoted 1 times

tavva_prudhvi 1 year, 3 months ago

Selected Answer: A

building a model based on words, may also be effective but could potentially be influenced by factors such as accents, dialects, or language variations that may differ between speakers.extracting sentiment directly from voice recordings, may be less accurate due to the subjective nature of interpreting emotions from audio alone.using syntactical analysis, may be useful in certain contexts but may not capture the full range of sentiment expressed in a conversation. Therefore, A provides the most comprehensive and unbiased approach to sentiment analysis in this scenario.

upvoted 1 times

pico 11 months, 3 weeks ago

Option A could be influenced by the syntactical nuances and structures used in different cultures

upvoted 1 times

tavva_prudhvi 11 months, 2 weeks ago

tavva_prudhvi 11 months, 2 weeks ago

See, both have their own advantages & dissadvantages, but we should choose the option which is more relevant

upvoted 1 times

ciro_li 1 year, 3 months ago

Selected Answer: A

Answer A

upvoted 1 times

ciro_li 1 year, 3 months ago

Answer B*

upvoted 1 times

erenklclar 1 year, 3 months ago

Selected Answer: C

By working directly with the audio data, you can account for important aspects like tone, pitch, and rhythm of speech, which might provide valuable information regarding sentiment.

upvoted 1 times

[Removed] 1 year, 3 months ago

But the audio will be affected by gender, age, and cultural differences of the customers. When you convert the recording to text, this problem is less pronounced. So the answer cannot be C

upvoted 1 times

NickHapton 1 year, 4 months ago

vote for A
between words and sentences:
Age and gender considerations: Sentences provide a broader view of sentiment that can help mitigate age and gender biases. Analyzing at the sentence level allows you to observe sentiment patterns across various demographic groups, which can help identify any biases that may arise. By considering the overall sentiment expressed in sentences, you can minimize the impact of individual words that might carry specific biases.

upvoted 1 times

M25 1 year, 6 months ago

Selected Answer: C

There is the possibility for a more sophisticated architecture for an audio processing pipeline, and the “not impact any stage of the model development pipeline and results” somewhat calls for a more holistic answer: https://cloud.google.com/architecture/categorizing-audio-files-using-ml#converting_speech_to_text. Plus, it adds “voice emotion information, related to an audio recording, indicating that a vocal utterance of a speaker is spoken with negative or positive emotion”: https://patents.google.com/patent/US20140220526A1/en.

upvoted 2 times

M25 1 year, 6 months ago

The emphasis here is on #ResponsibleAI https://cloud.google.com/natural-language/automl/docs/beginners-guide

upvoted 1 times

M25 1 year, 6 months ago

A reason why one could exclude “Convert the speech to text” altogether [Options A, B & D] could be, for instance, because “speech transcription may have higher error rates for African Americans than White Americans [3]”: https://developers.googleblog.com/2018/04/text-embedding-models-contain-bias.html.

upvoted 1 times

M25 1 year, 6 months ago

“Cloud NL API can perform syntactic analysis directly on a file located in Cloud Storage.” “Syntactic Analysis [Option D] breaks up the given text into a series of sentences [Option A] and tokens (generally, words [Option B]) and provides linguistic information about those tokens”: https://cloud.google.com/natural-language/docs/analyzing-syntax.
It “can be used to identify the parts of speech, determine the structure of a sentence, and determine the meaning of words in context”: https://ts2.space/en/a-comprehensive-guide-to-google-cloud-natural-language-apis-syntax-analysis/.

upvoted 1 times

[Removed] 1 year, 6 months ago

Selected Answer: B

Can anyone explain how to choose between words and sentences? I feel like the model could pick up bias from both

upvoted 1 times

formazioneQI 1 year, 6 months ago

Selected Answer: B

I agree with qaz09. To avoid demographical variables influence model shoud be built on the words.

upvoted 2 times

TNT87 1 year, 8 months ago

Selected Answer: A

Answer A

upvoted 1 times

qaz09 1 year, 8 months ago

Selected Answer: B

For "ensuring that the gender, age, and cultural differences of the customers who called the contact center do not impact any stage of the model development pipeline and results" I think the model should be built on the words rather than sentences

upvoted 3 times

ares81 1 year, 10 months ago

Selected Answer: A

A makes sense, to me.

upvoted 1 times

hiromi 1 year, 10 months ago

Selected Answer: A

A

Convert the speech to text and extract sentiments based on the sentences.

upvoted 1 times

mil_spyro 1 year, 10 months ago

Selected Answer: D

vote D

upvoted 1 times

Yajnas_arpohc 1 year, 7 months ago

Based only on words might be misleading; at a minimum need to go w sentences

upvoted 2 times

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