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Exam Professional Machine Learning Engineer All Questions

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EXAM PROFESSIONAL MACHINE LEARNING ENGINEER TOPIC 1 QUESTION 225 DISCUSSI...

Actual exam question from Google's Professional Machine Learning Engineer

Question #: 225

Topic #: 1

[All Professional Machine Learning Engineer Questions]

You work for a telecommunications company. You're building a model to predict which customers may fail to pay their next phone bill. The purpose of this model is to proactively offer at-risk customers assistance such as service discounts and bill deadline extensions. The data is stored in BigQuery and the predictive features that are available for model training include:

- Customer_id
- Age
- Salary (measured in local currency)
- Sex
- Average bill value (measured in local currency)
- Number of phone calls in the last month (integer)
- Average duration of phone calls (measured in minutes)

You need to investigate and mitigate potential bias against disadvantaged groups, while preserving model accuracy.

What should you do?

- A. Determine whether there is a meaningful correlation between the sensitive features and the other features. Train a BigQuery ML boosted trees classification model and exclude the sensitive features and any meaningfully correlated features.
- B. Train a BigQuery ML boosted trees classification model with all features. Use the ML.GLOBAL_EXPLAIN method to calculate the global attribution values for each feature of the model. If the feature importance value for any of the sensitive features exceeds a threshold, discard the model and tram without this feature.

- C. Train a BigQuery ML boosted trees classification model with all features. Use the ML.EXPLAIN_PREDICT method to calculate the attribution values for each feature for each customer in a test set. If for any individual customer, the importance value for any feature exceeds a predefined threshold, discard the model and train the model again without this feature.
- D. Define a fairness metric that is represented by accuracy across the sensitive features. Train a BigQuery ML boosted trees classification model with all features. Use the trained model to make predictions on a test set. Join the data back with the sensitive features, and calculate a fairness metric to investigate whether it meets your requirements.

Show Suggested Answer

by Apikachu007 at Jan. 13, 2024, 7:27 a.m.

Comments

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☐ ♣ fitri001 6 months, 3 weeks ago

Selected Answer: D

Fairness Metric: Defining a metric like parity (equal accuracy) or calibration (similar predicted probabilities) across sensitive features like age, sex, or salary allows you to quantify potential bias.

Model Training with All Features (Initially): Training the model with all features provides a baseline performance and allows you to identify potentially biased features later.

Test Set Predictions: Making predictions on a held-out test set ensures the evaluation is based on unseen data and avoids overfitting.

Joining Back Sensitive Features: Reintroducing sensitive features after prediction allows you to calculate fairness metrics for different customer groups.

Iterative Refinement: Based on the fairness metric results, you can determine if further mitigation strategies are needed.

upvoted 2 times

= 4 fitri001 6 months, 3 weeks ago

A. Excluding Features Based on Correlation: While correlated features might indicate bias, simply excluding them can discard valuable information and potentially reduce model accuracy.

B. Global Attribution for Feature Removal: Using global feature importance might not reveal bias impacting specific customer groups. Additionally, discarding a feature solely based on importance could affect model performance.

C. Individual Attribution for Model Discarding: While individual attribution can identify per-customer bias, discarding the model entirely based on a single instance might be overly cautious and lead to starting from scratch frequently.

upvoted 1 times

■ pinimichele01 7 months ago

Selected Answer: D

https://cloud.google.com/vertex-ai/docs/evaluation/intro-evaluation-fairness

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■ prtikare 7 months, 4 weeks ago

Answer is A

upvoted 1 times

shadz10 9 months, 3 weeks ago

Selected Answer: D

https://cloud.google.com/vertex-ai/docs/evaluation/intro-evaluation-fairness

upvoted 1 times

pikachu007 9 months, 3 weeks ago

Selected Answer: D

Direct Bias Assessment: It directly measures model fairness using a relevant metric, providing clear insights into potential issues.

Preserving Information: It avoids prematurely removing features, potentially capturing valuable predictive signals while mitigating bias.

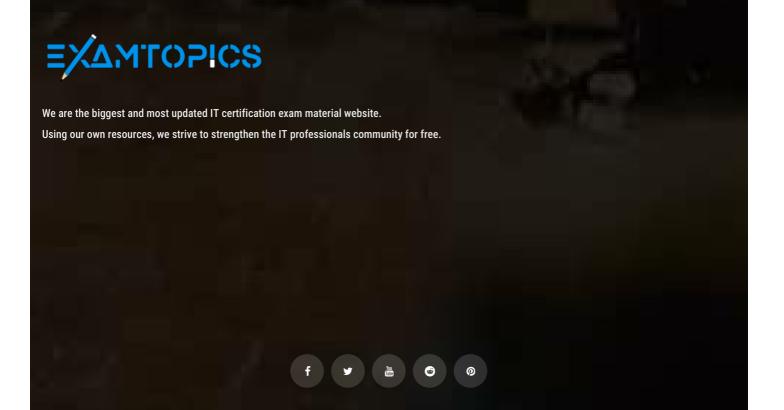
Aligning with Goals: It allows tailoring the fairness metric to specific ethical and business objectives.

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