



AI Bias

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Problem Statement

As our dependence on AI expands daily, so does the risk of bias affecting its outcomes. This bias can not only distort results but also show inequalities and undermine confidence and trust in these AI systems. Therefore, addressing bias in AI becomes increasingly vital as it becomes more integrated into our daily lives. In the future, how can we navigate the use of AI while actively identifying and mitigating potential biases?



Research

“Artificial intelligence image-based prediction models in IBD exhibit high risk of bias: A systematic review”

Xiaoxuan Liu a b, James Reigle b c, V.B. Surya Prasath_a b c, Jasbir Dhaliwal a b c

- IBD: Inflammatory Bowel Disorder
- Researched 3 databases (PubMed, Scopus and Embase) to identify models imaging data for IBD
 - Primarily conventional imaging data with human participants in english
- Used PROBAST (prediction risk of bias assessment tool) to determine risk of bias

What is PROBAST?

“PROBAST: A Tool to Assess the Risk of Bias and Applicability of Prediction Model Studies”

Robert F Wolff 1, Karel G M Moons 2, Richard D Riley 3, Penny F Whiting 4, Marie Westwood 1, Gary S Collins 5, Johannes B Reitsma 2, Jos Kleijnen 6, Sue Mallett 7; PROBAST Group

- Developed considering existing ROB (risk of bias) tools and reporting guidelines.
- Organized into the following 4 domains: participants, predictors, outcome, and analysis
 - Domains contain a total of 20 signaling questions to facilitate structured judgment of ROB
 - “Defined to occur when shortcomings in study design, conduct, or analysis lead to systematically distorted estimates of model predictive performance.”
- “Although PROBAST was designed for systematic reviews, it can be used more generally applied in critical appraisal of prediction model studies”

Research Results

- Forty studies were included, thirty-nine developed diagnostic models. (The majority of image-based studies used colonoscopy images)
- "Overall, all studies demonstrated high risk of bias."

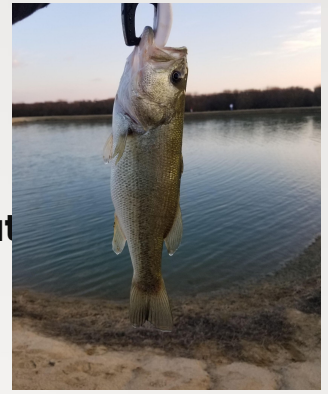
"The risk of bias was high in AI IBD image-based prediction models, owing to insufficient sample size, unreported missingness and lack of an external validation cohort."



Different Opinions on AI Bias

“Speciesist bias in AI: how AI applications perpetuate discrimination and unfair outcomes against animals”

Thilo Hagendorff, Leonie N. Bossert, Yip Fai Tse & Peter Singer



- “AI technologies currently play a significant role in perpetuating and normalizing violence against animals.”
- Anthropocentric
- “Interhuman, as well as speciesist biases, have common ideological roots, whereas ‘social dominance orientation”
- “Pictures of fish are angler trophy photos instead of in their natural environments. Similarly, lobsters or crab species are shown in restaurant or kitchen environments”
- “Farm animals are portrayed in a non-representative way: “Cows, pigs, or chickens are predominantly shown in free-range environments, whereas the overwhelming majority of these animals are actually confined in crowded factory farms”

Response Article

"Apropos of 'Speciesist bias in AI: how AI applications perpetuate discrimination and unfair outcomes against animals' "

- "I examine the authors' analysis and show it, ironically, to be prejudicial, often being founded on poorly conceived assumptions and suffering from fallacious and insufficiently rigorous reasoning, its appeal in large part relying on the extant consensus in the community."
- Discusses the subjective use of language and the deliberate interpretation of results to fit preconceived notions of prejudice

Technical Demonstration

100 Sports Image Classification

13493 train, 500 test, 500 validate images 224,224,3 jpg format



[Data Card](#) [Code \(95\)](#) [Discussion \(2\)](#) [Suggestions \(0\)](#)

About Dataset

Context

Please upvote if you find this dataset of use. - Thank you

This version is an update of the earlier version. I ran a data set quality evaluation program on the previous version which found a considerable number of duplicate and near duplicate images. Duplicate images can lead to falsely higher values of validation and test set accuracy and I have eliminated these images in this version of the dataset.

Images were gathered from internet searches. The images were scanned with a duplicate image detector program I wrote. Any duplicate images were removed to prevent bleed through of images between the train, test and valid data sets. All images were then resized to 224 X 224 X 3 and converted to jpg format. A csv file is included that for each image file contains the relative path to the image file, the image file class label and the dataset (train, test or valid) that the image file resides in. This is a clean dataset. If you build a good model you should achieve at least 95% accuracy on the test set. If you build a very good model for example using transfer learning you should be able to achieve 98%+ on test set accuracy. If you find this data set useful please upvote. Thanks

Usability ⓘ

8.82

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Expected update frequency

Not specified

Tags

Sports

Image

Classification

Computer Vision

Ethical Concerns

- As AI continues to develop, more and more people are viewing the models as an objective truth
 - If these AI models are biased to begin with, the bias will only grow worse as the general user trusts the validity of AI, further exacerbating the problem
- Given the trust in AI, machines can contribute to spreading untrue information, suppressing certain ideas, and helping people come to erroneous conclusions
- Recognizing and accounting for the errors AI can make is essential to maintaining accurate information and contributing free-flowing, creative ideas

Future Developments

- Up until recently, AI has remained largely out of the public eye
- With the increased popularity in AI products over the past few years, governments around the world have begun to take notice of the issues presented from AI
- The U.S Government regulates many important industries in our daily lives (utilities we use, food we eat, cars/planes we travel in)
- As leaders continue to discuss AI and its impacts, we can expect to see more oversight and regulation from the government and other organizations