

Radiologists and AI

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Role of Radiologists in Diagnostic ML Algorithms

- **Define use cases** that would be amenable to ML solutions
- **Create datasets** for algorithm training, validation and testing
- **Implement algorithms** for patient care while ensuring safety, clinical relevance and return on investment
- **Offer user feedback inputs** for continued adaptive machine learning

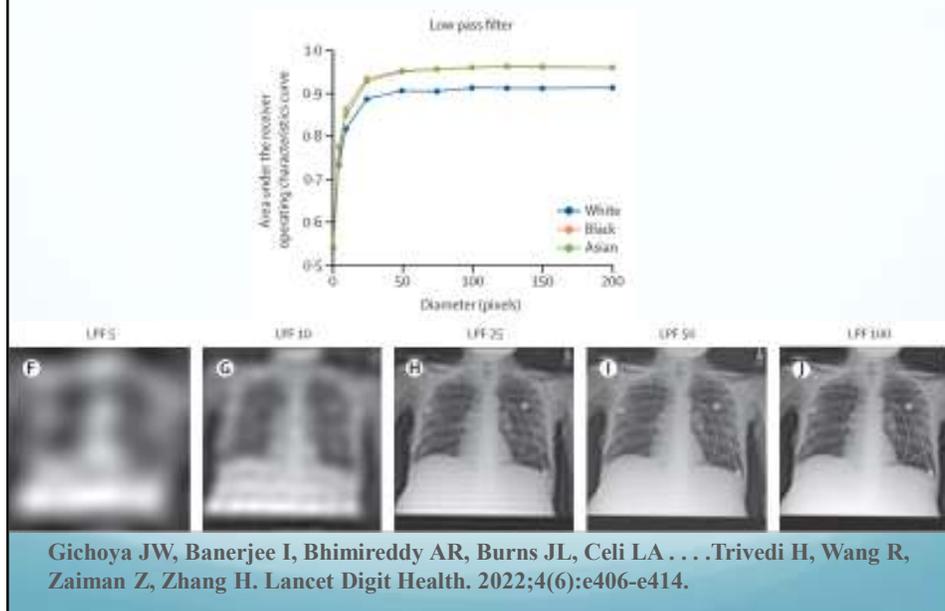
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Data Ethics Issues

- Patient Privacy
- Generalizability
- ‘Bias’
- Data ownership and access
- Reproducibility
- Access to publications & work product

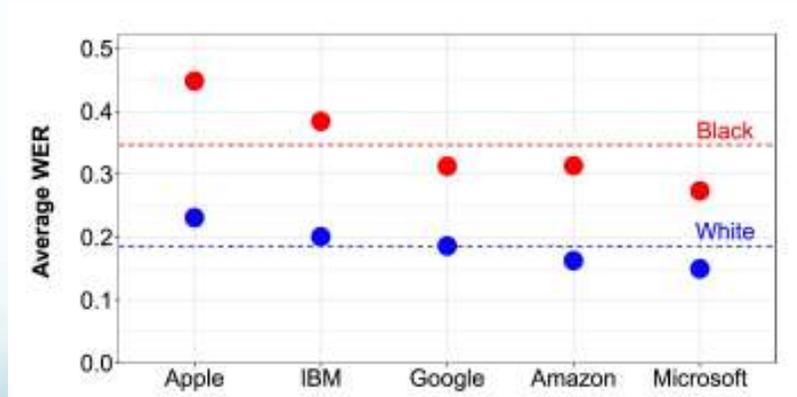
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Privacy: CXR & Race



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Generalizability and Bias: Speech Recognition

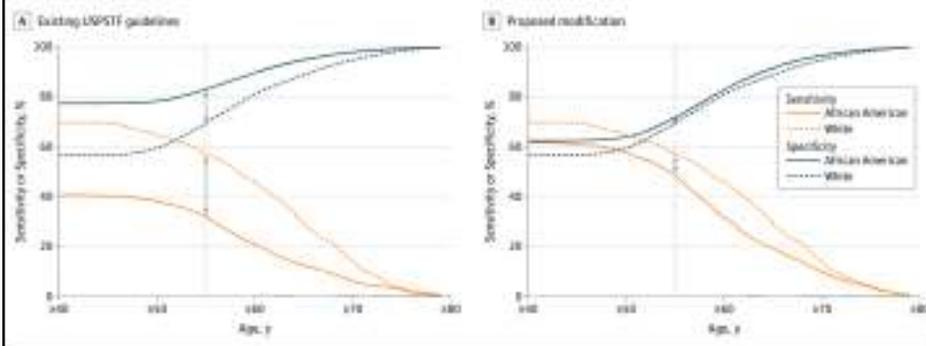


Koenecke A, Nam A, Lake E, Nudell J, Quartey M, Mengesha Z, Toups C, Rickford JR, Jurafsky D, Goel S. Proc Natl Acad Sci U S A. 2020;117(14):7684-7689.

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Race in Lung Cancer Screening

Figure 2. Sensitivity and Specificity by Age and Smoking Pack-Years for Existing United States Preventive Services Task Force (USPSTF) Eligibility Guidelines and Their Proposed Modification



Existing USPSTF eligibility guidelines are defined as 20 pack-years or more for all races; proposed modification is defined as 30 pack-years or more for white persons and 20 pack-years or more for African American persons.

Evaluation of USPSTF Lung Cancer Screening Guidelines Among African American Adult Smokers

Melinda C. Albrecht, PhD¹, Sarah E. Mercurio, PhD^{1,2}, Kim L. Sordley, MD¹, et al

> Author Affiliations | Article Information

JAMA Oncol. 2019;5(5):1318-1324. doi:10.1001/jamaoncol.2019.1407

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Beware: Hidden Complexity

Original Image



Persian cat 95%
 Lynx 1%
 Angora 1%
 Sphynx 1%
 Fomorian 1%

Hacked Image



toaster 95%
 Crock Pot 1%
 Siamese cat 1%
 wallaby 1%
 rattan 1%

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AI's "Character"



A.I. is imprecise, which means that it can be *unreliable as a partner*. It's changing all the time and *does things that you don't expect*. And, most importantly, *it's capable of learning*.

--- Eric Schmidt, former CEO of Google

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