

~~Artificial~~ Augmented Intelligence and Bias

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Disclosure

- No financial conflicts of interest

How did you get involved in AI?

Original Investigation

FREE

November 2017

Association of Delays in Surgery for Melanoma With Insurance Type

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People Of Color Are Dying Because Of Delays In Lifesaving Melanoma Surgery

Race shouldn't determine whether or not Americans with melanoma live or die. Unfortunately, new studies show that it does.



By Sara Faye Green Nov 14, 2017



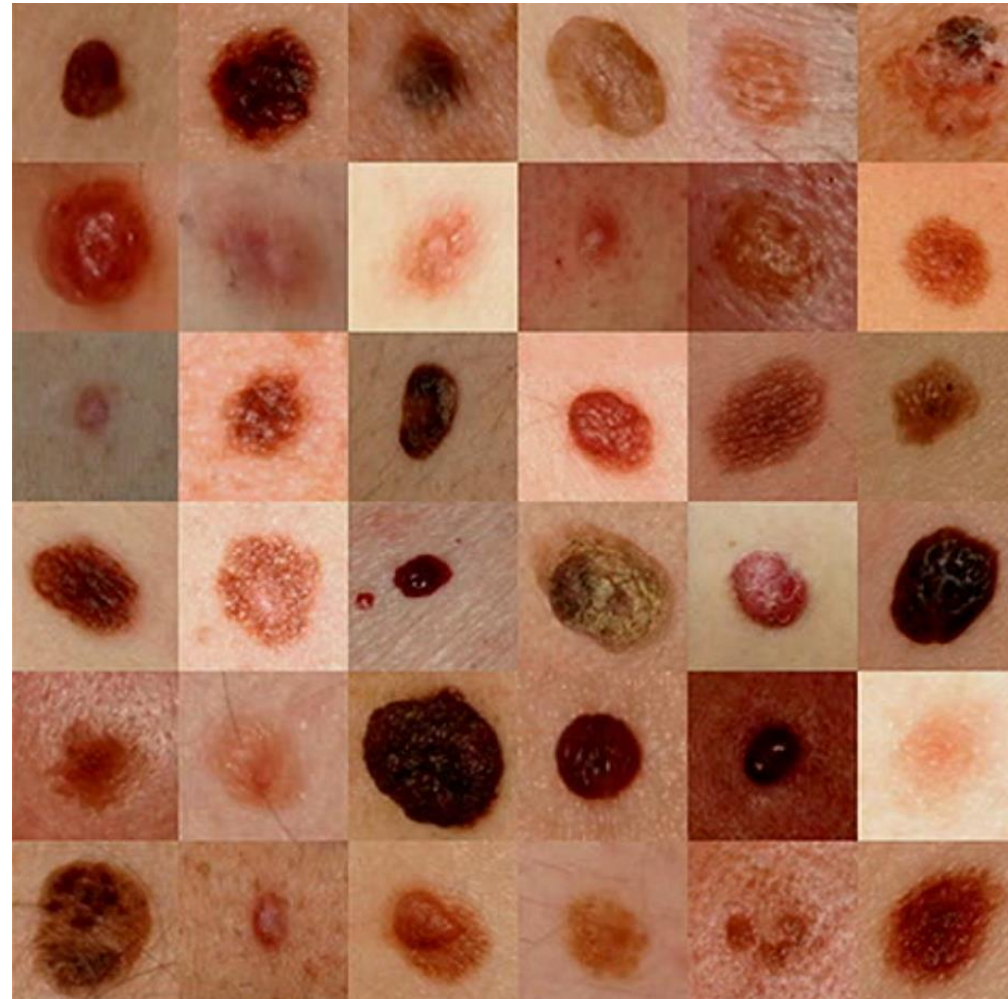
Viewpoint

November 2018

Machine Learning and Health Care Disparities in Dermatology

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Lack of diversity of skin types



Non-white race is associated with later detection

Table I. Primary cutaneous melanoma: overall cutaneous melanoma diagnosis stratified by race and stage

| Category | Percentage of diagnosis | 95% CI |
|-----------|-------------------------|-------------|
| Stage I | | |
| White | 75.97 | 75.62-76.31 |
| Black | 52.68 | 47.02-58.28 |
| AANAPI | 61.17 | 58.45-63.90 |
| Hispanic | 69.17 | 67.92-70.40 |
| Stage II | | |
| White | 12.93 | 12.67-13.20 |
| Black | 22.82 | 18.42-27.91 |
| AANAPI | 16.48 | 10.60-22.30 |
| Hispanic | 15.33 | 11.91-18.74 |
| Stage III | | |
| White | 6.65 | 6.45-6.85 |
| Black | 13.42 | 10.01-17.76 |
| AANAPI | 12.13 | 5.97-18.29 |
| Hispanic | 9.36 | 5.70-13.01 |
| Stage IV | | |
| White | 4.45 | 4.29-4.62 |
| Black | 11.07 | 7.99-15.14 |
| AANAPI | 10.22 | 3.92-16.50 |
| Hispanic | 6.14 | 2.35-9.92 |

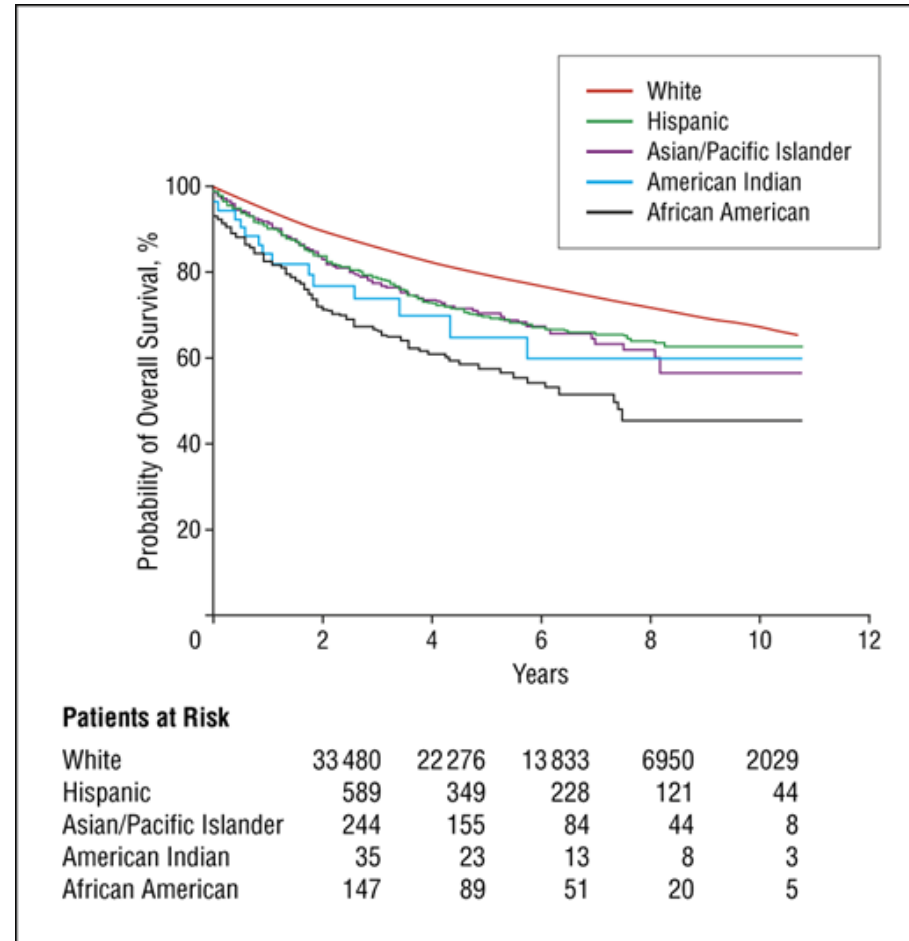
AANAPI, Asian American/Native American/Pacific Islander; CI, confidence interval.

Table II. Primary cutaneous melanoma: relative risk for stages I through IV at presentation for white versus black patients

| Stage | Blacks RR | 95% CI |
|-------|-----------|-----------|
| I | 0.69 | 0.62-0.77 |
| II | 1.76 | 1.43-2.18 |
| III | 2.02 | 1.51-2.70 |
| IV | 2.49 | 1.80-3.44 |

CI, Confidence interval; RR, relative risk.

Non-white race is associated with lower survival



Problems with AI in dermatology

- ML algorithms are only as good as the inputs used to train them.
- Without representative inputs, we are at risk of worsening disparities in health care outcomes.
- We have a chance to intervene before a health care disparity potentially widens.

Solutions for AI in darker skin

- Oversample skin lesions in skin of color.
- Design a separate algorithm for darker skin tones (less ideal).
- Find digital solutions using image manipulation techniques to mimic dark skin.

But skin cancer really isn't a big deal in darker skin types!!!

Disparities may worsen for inflammatory disorders



Other potential issue

- AI-driven triage could prioritize certain patients over others, limiting access for vulnerable groups.
- AI-driven clinical trial recruitment based on biased historical data could hamper recruitment.

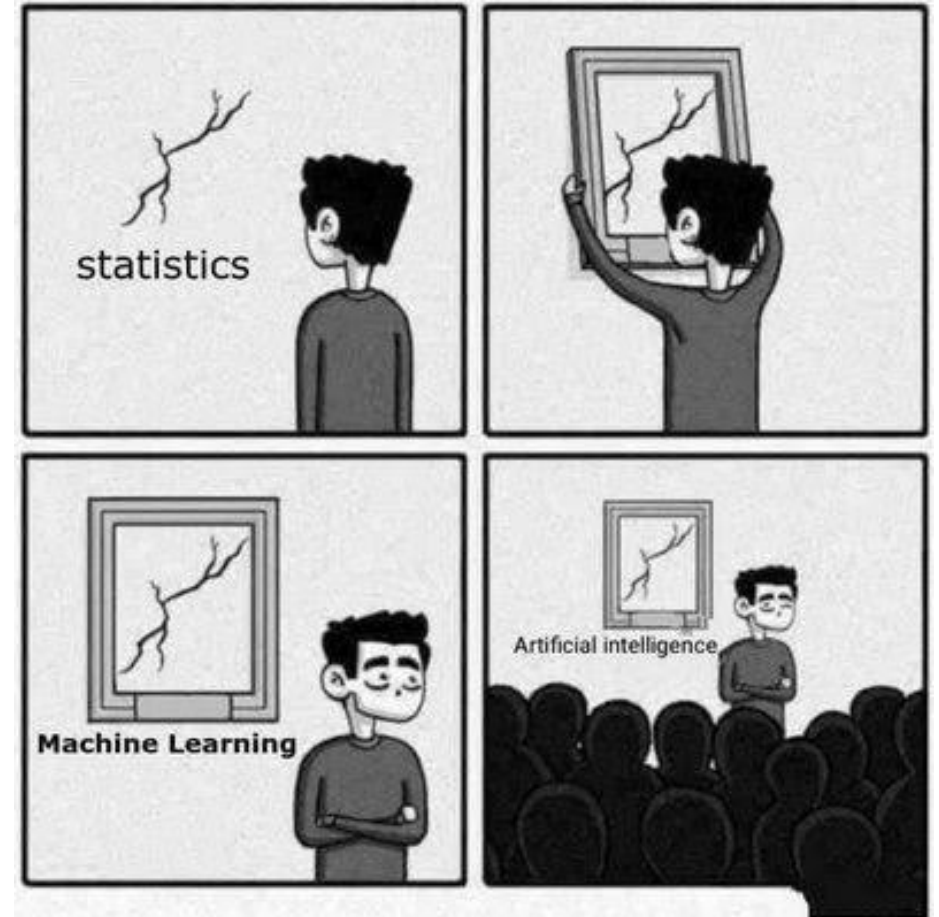
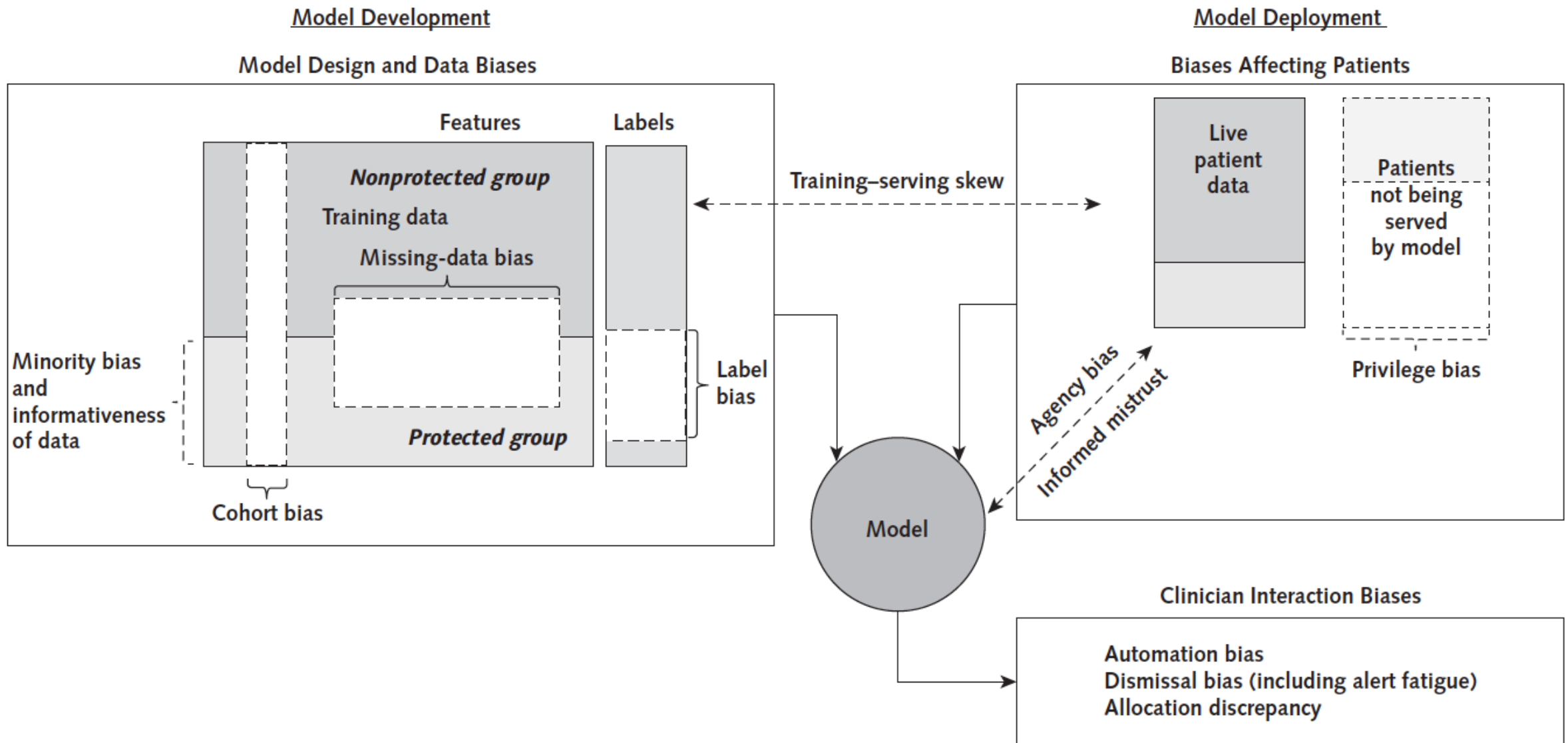


Figure. Conceptual framework of how various biases relate to one another.



Thank you

- UT Austin Dell Medical School
- Avery Smith, MS
- Justin Ko, MD, MBA



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