

Ground Truthing the Benefits and Risks of Generative Artificial Intelligence (AI)

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Using Machine Learning in
Safety-Critical Applications:
Setting a Research Agenda



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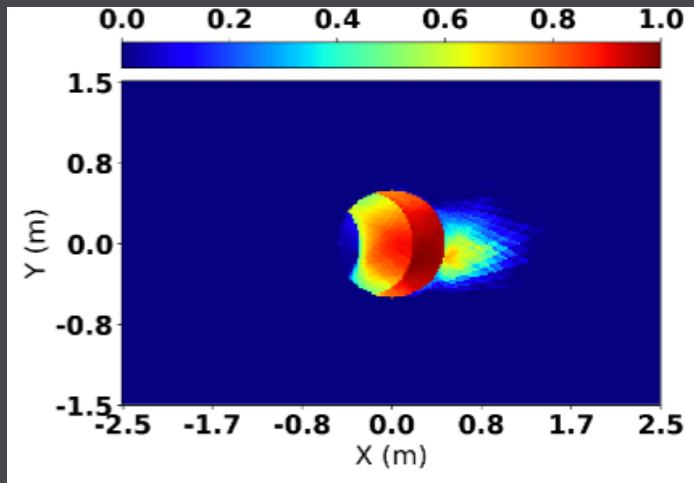
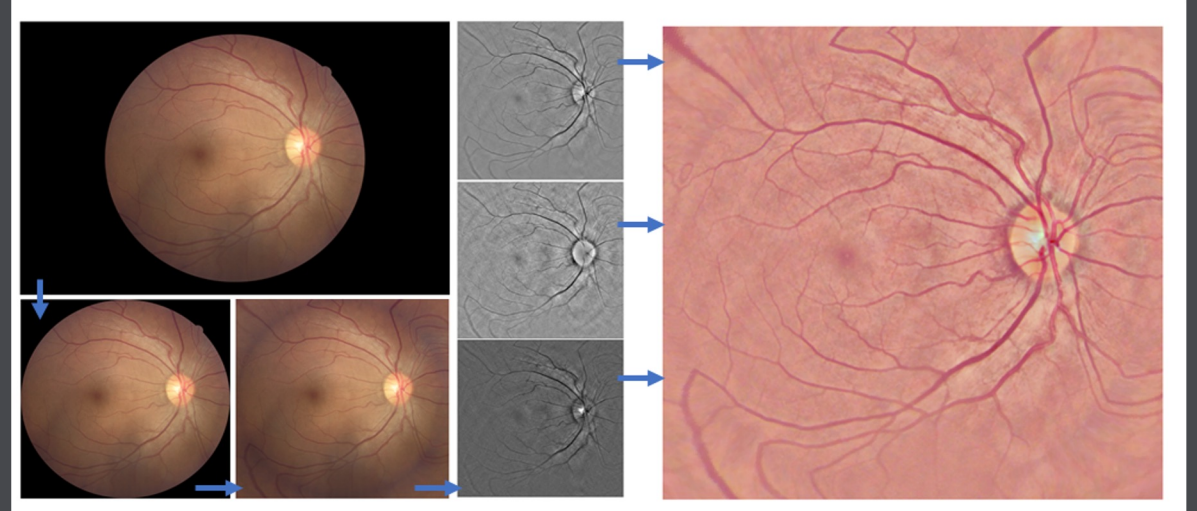
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AI Research at UNM





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Why Now?

Unprecedented Growth of AI

- 1) Scale
 - 2018- 100 million parameters
 - 2018- 300 million parameters
 - 2019- 1.5 billion parameters
 - 2019- 8 billion parameters
 - 2020 18 billion parameters
 - 2020- GPT-3 175 billion parameters
 - 10,000 NVIDIA GPUs and (estimated) 12GW of power
- 2) Human Interface & Interaction
- 3) Ubiquity

What does this mean for New Mexicans?



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Why Worry?

Specific Issues

- AI Safety (errors, mistakes)
- Misinformation
- Education
- Social Justice & Bias
- Criminal justice
- Privacy

Broader Context

- It is unknown how AI will exploit & adapt to human expectations
 - And vice versa
- AI functionality & who produces it can change quickly
 - But be wary of snake oil salesmen
- Expect unintended consequences
 - Consider history of computer security & social media

NOT The Problem



The Problem

Bias, errors & bad actors: criminals, corporations & governments misuse AI.



Does something look 'off'?



This image looks realistic, but take a closer look at Trump's right arm and neck



Wired

<https://www.wired.com> > Security > security roundup

AI Is Being Used to 'Turbocharge' Scams

Suspected Internet Crime Cost New Mexico Victims Almost \$24 Million in 2020

NOT The Problem



The Problem

Bias, errors & bad actors: criminals, corporations & governments misuse AI.

A snippet from a New York Times article. The title is "Wrongfully Accused by an Algorithm". The text below reads: "In what may be the first known case of its kind, a faulty facial recognition match led to a Michigan man's arrest for a crime he did not commit." To the right is a black and white portrait of a man with a beard and mustache, wearing a striped polo shirt.

States' Automated Systems Are Trapping Citizens in Bureaucratic Nightmares With Their Lives on the Line

A cover of TIME magazine featuring a man and a woman sitting on a wooden bench outdoors. The man is wearing a red and white shirt, and the woman is wearing a yellow sweater. The word "TIME" is printed in red in the top left corner.A screenshot from a Fox News broadcast. The main image shows a man in a suit speaking in front of a Christmas tree. A smaller inset image shows a classroom with students at desks. A banner at the bottom reads "ROBOTS NOW DOING HOMEWORK FOR LAZY STUDENTS". The Fox News logo and "THE FIVE" are also visible.

Fox News
NYC bans AI tool ChatGPT in schools ...


A photograph of the atomic bomb Trinity test, showing a large, glowing orange and yellow mushroom cloud rising from the ground against a dark background.

**We thought we might start a
chain reaction that might
destroy the entire world.**

- J Robert Oppenheimer

Atomic bomb Trinity test.

UNIVERSAL HISTORY ARCHIVE/UIG VIA GETTY IMAGES

A close-up photograph of blue water with concentric ripples, suggesting a stone or object has just been dropped into it.

**Powerful new technologies
reshape the world...**

**but not in the ways we initially
fear or expect.**



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What Can You Do?

Recommendations and
Opinions made by
Melanie Moses

Broader Context

- Continue learning about AI
- UNM & SFI are resources
- Global, national & state responses needed in AI-infused society
- Protect rights & define responsibilities for New Mexicans
- Consider (dis)incentives & regulation
- Educate NM about AI
- K-12 & Universities & more
- Be prepared for AI benefits & risks to evolve

Specific Recommendations

- Regulate misinformation
- Fraud
- Political campaigns
- Regulate for AI safety: medicine (incl rural), automated cars, insurance
- Invest in AI education for NM
- Protect Rights to privacy & control of copyrighted content
- Transparency in NM govt use of algorithms
- Provide Anti-bias protections: housing, employment screening, criminal justice
- Use AI to make govt services more accessible



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<https://www.santafe.edu/research/projects/algorithmic-justice>
- National Academy Study on Safety in ML:
<https://www.nationalacademies.org/our-work/using-machine-learning-in-safety-critical-applications-setting-a-research-agenda>



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