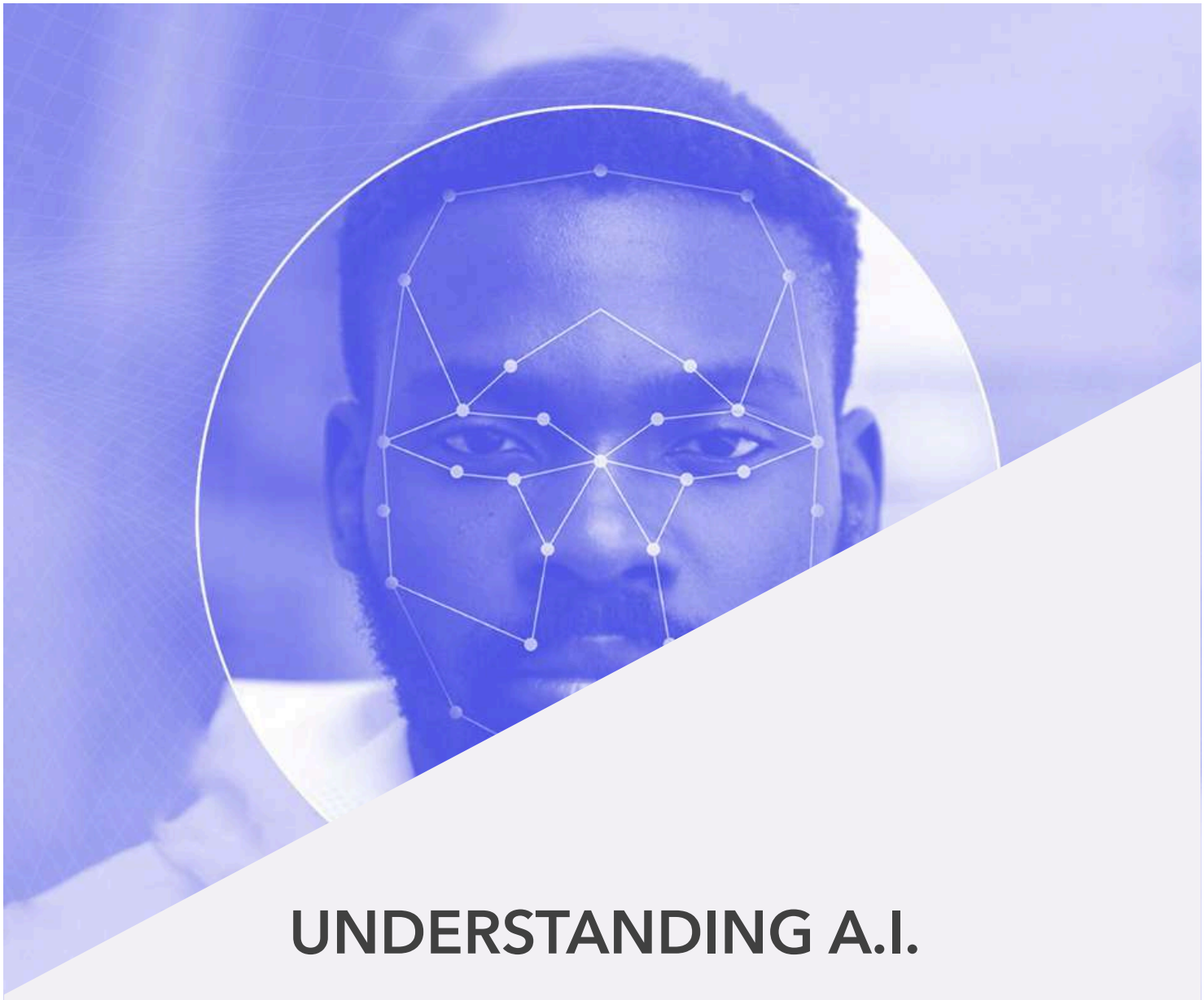


UNDERSTANDING A.I.

EXPLORING YR MEDIA'S INNOVATIVE APPROACHES TO INFORMAL EDUCATION IN ARTIFICIAL INTELLIGENCE

Final Evaluation Report

Rockman et al

www.rockman.com

Project Credits:
This publication is based on work supported by the National Science Foundation's DRL Division of Research on Learning AISL Award #1906895: Innovative Approaches to Informal Education in Artificial Intelligence. Any views, findings, conclusions or recommendations expressed in this document are those of the authors, quoted research participants, or cited works, and do not necessarily reflect the views of the National Science Foundation.

For permission requests, contact:

Rockman et al

Email: info@rockman.com

www.rockman.com

Recommended citation: Gurn, A. , Kirtman, N. & Bass, K., & Harris, H. (2022). Understanding AI: Exploring YR Media's Innovative Approaches to Informal Education in Artificial Intelligence. San Francisco, CA: Rockman et al.

About Rockman et al:
Rockman et al is an employee-owned cooperative, focusing on evaluation and research. Our mission is to use rigorous and innovative social science methodologies to provide research-based recommendations that support the improvement, sustainability, and expansion of educational programs. Learn more at www.rockman.com.

TABLE OF CONTENTS

YOUTH LITERACY IN THE AGE OF BIG DATA, ALGORITHMS & ARTIFICIAL INTELLIGENCE (AI)

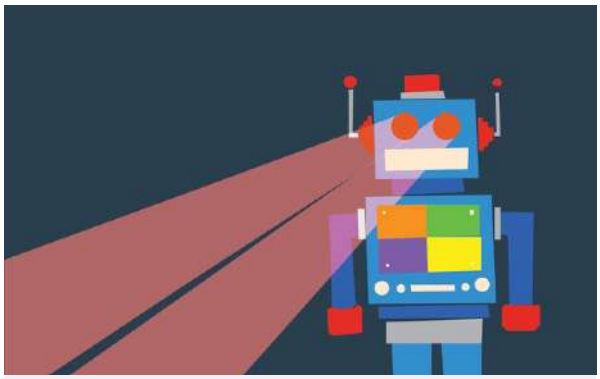
For over two decades, often with the support of the National Science Foundation (NSF), YR Media (formerly Youth Radio) has been working to develop and research innovative approaches to informal STEM learning through media production. Drawing on digital technologies and reaching across the interdisciplinary STEM community, this out-of-school time education organization makes journalistic media in collaboration with young people, primarily from diverse demographics historically underrepresented in STEM fields.

With a grant award from the NSF's AISL program, YR Media and MIT launched a collaborative three-year project, *Understanding Artificial Intelligence* (UAI), to research and develop innovative approaches to informal education in AI. Building on learning strategies and research methods developed over years of iterative testing, the UAI project engaged young people to learn, create media, and communicate with public audiences about the role of AI in young people's lives.

> *"Young people come to YR and learn to tell stories on their terms…We knew that our point of entry into AI was probably going to have a lot to do with equity, because that's one of the concerns that we bring to everything we do."*
>
> *-YR Media Practitioner Researcher*

AI, the research and development of machines to mimic human thought and behavior, encompasses one of the most complex scientific and engineering challenges of recorded history (West & Allen, 2018; Anderson et al, 2018). AI now permeates essentially all sectors of the economy and society. From speech recognition and natural language processing used to run customer service chatbots or social media bots to interactive filters on Zoom meetings and video posts to social media platforms curating "news" feeds and advertising to smartphone apps that recognize fingerprint and facial patterns to search engines rigorously tracking and predicting user searches over time to educational assessment tools for proctoring online tests to policing, security and surveillance technology built into our public and private spaces, to name a few examples, AI systems are rapidly reshaping the digital landscape as well as the future of work.

Building computer systems and robots capable of learning from observation or input and applying decision-making to a broad variety of tasks, AI proponents assert a wide range of resulting economic and societal benefits (McKinsey Global Institute, 2018). Intelligent automation may lead to greater efficiency in human endeavors, economic



growth and new jobs, enhanced work or personal productivity, or help solving some of our biggest social, medical, and environmental problems. While recognizing that AI holds promise in an array of fields, it is equally important to consider the current and future risks (Bornstein & Howard, 2021). For instance, racial and gender-based discrimination has been shown to arise from biases built into the algorithms or the datasets used to train AI systems. Training data routinely exclude people of color, women, and other underrepresented groups, thus leading the technology to make predictions and respond to the environment based on skewed representations of the human world (Silberg & Manyika, 2019).

While some AI products are commercially spotlighted or go viral, others operate quietly in the background, obscured from most consumers' views. "Digital data and hidden algorithms are intelligent mechanisms for managing user activity, behavior, attention, content, information, and knowledge when using media and new digital technologies" (Ptaszek, 2021, p. 233).

Young people growing up in the era of big data, algorithms, and AI need to develop new awareness, content knowledge, and skills to understand humans' relationships to these new technologies and to become producers of AI artifacts themselves (DiPaola et al, 2020). Efforts to teach youth about AI first appeared shortly after AI experimentation began (Solomon et al, 2020). With the rapid rise of AI-powered media and information technologies in recent years, many AI literacy programs for K-12 and college age students have been developed (Touretzky et al, 2019).

As society becomes more and more reliant on AI, formal and informal education approaches are necessary to create youth learning opportunities to support current users and future producers to understand how AI operates, the role of human-machine interactions, and the tools to responsibly harness its power.

UNDERSTANDING AI: EVALUATING YOUTH MEDIA

With an eye to developing the creative talents and resources of young people historically marginalized from STEM, the *Understanding AI* project explored the role of AI as a shaping force in society in collaboration with the next generation of AI users and creators. UAI leveraged YR Media's national network of youth producers and collegial pedagogy model for youth media, developed through prior NSF support, to design and research youth-interest-driven informal STEM pedagogy examining AI.

By tackling AI within the context of youth media, the project examined how informal educators and underrepresented youth can collaborate to research and tell stories about how AI operates, its social and cultural significance, and pressing ethical issues.

Rockman et al (REA), an independent research and evaluation cooperative, conducted an external evaluation to assess the project's implementation and outcomes and to provide recommendations towards project goals. Using a case study approach that drew on repeated youth surveys, observations of learning activities, and both short and extended interviews with program participants and target audiences, the evaluation explored the context of teaching, learning, and communicating about AI through youth media (See Appendix for description of evaluation methods).

The project's research and the external evaluation pursued key questions:

RQ1: *What do young people who are underrepresented in STEM understand (and misunderstand) about AI and its role in society, and what are their urgent questions related to AI in their lives and futures?*

RQ2: *What are the biggest ethical dilemmas posed by AI from the vantage point of underrepresented youth?*

RQ3: *What are the features of an ethics-centered pedagogy and set of consequential learning activities that promote STEM engagement via AI?*

RQ4: *What impact do the AI products and content young people develop have on target audiences, including underrepresented youth and formal and informal educators?*

This report synthesizes the evaluation findings. We invite readers to ponder what it takes for community-based educators to partner with young people on investigative storytelling and media making, what happens when they do, and how to incorporate youth media into other teaching and learning contexts. We encourage young creators and educators to explore YR Media's teaching and DIY resources, such as DIY: Tips for Reporting on AI. Consider submitting a pitch or connect with others within YR's growing online learning community.

Learning and Working Through Complex and Uncertain Times

The *Understanding AI* project unfolded through a period of intense change, isolation, and social unrest experienced living through a global pandemic. Navigating COVID-19's social and economic impacts as well as the transition to distance learning created disruptions to existing youth services. By extending youth work-based learning opportunities online, when many community-based organizations paused activities, YR Media provided connection and cohesion for young people and staff who were able

to be paid and continue their professional development within a caring community. Interviews identified ongoing struggles to sustain motivation and engagement during virtual-only programming, while YR Media also offered a break from outside stress or isolation. As was common practice prior to the pandemic, staff created space for youth to talk about their everyday lives and process issues they were experiencing, helping to support their social and emotional well-being through uncertain times. Digital tools, such as Google Suite, Figma, and Basecamp, were also used to promote collaborative interaction and make work visible across the team on youth media projects.

EXPLORING YOUNG PEOPLE'S EXPERIENCES WITH AND PERSPECTIVES ON AI IN SOCIETY

What is AI?

YR Media youth participants said:

AI is "a computer intelligent enough to mimic and predict human behavior."

"AI is programmed algorithms…which assist humans in completing tasks from everyday to large-scale."

AI is "programming that allows [machines] to make actions for themselves."

AI is "changing us in surprising ways."

AI is "Scary."

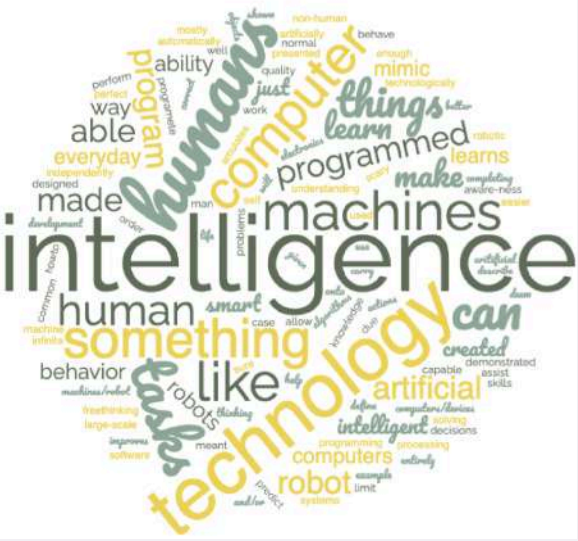


Figure 1: 'What is AI' Word Cloud

The external evaluation found that youth participants gained foundational understanding of social, cultural, and ethical dimensions of AI through the process of researching and creating digital media products for real audiences. By investigating and telling stories for national audiences, youth participants and STEM educators collaborated to produce interactive, fact-based media to inform and enable public engagement in important, timely issues impacting youth communities.

Youth surveys administered in 2019, 2020, and 2021 suggested both certain changes and consistency in young people's ideas and opinions about AI. Readers are advised not to interpret changes across years as causal impact. Survey responses were unmatched, and most participants completing surveys each year were new to the program. Thus, findings captured patterns in youth understanding of AI, rather than pre-and-post measurement of intervention impacts.

Youth were asked to define AI in their own words. Responses showed distinct overlapping themes each year. Descriptions of AI varied widely, ranging from programmable computer systems,

Figure 2: Select the best definition of AI

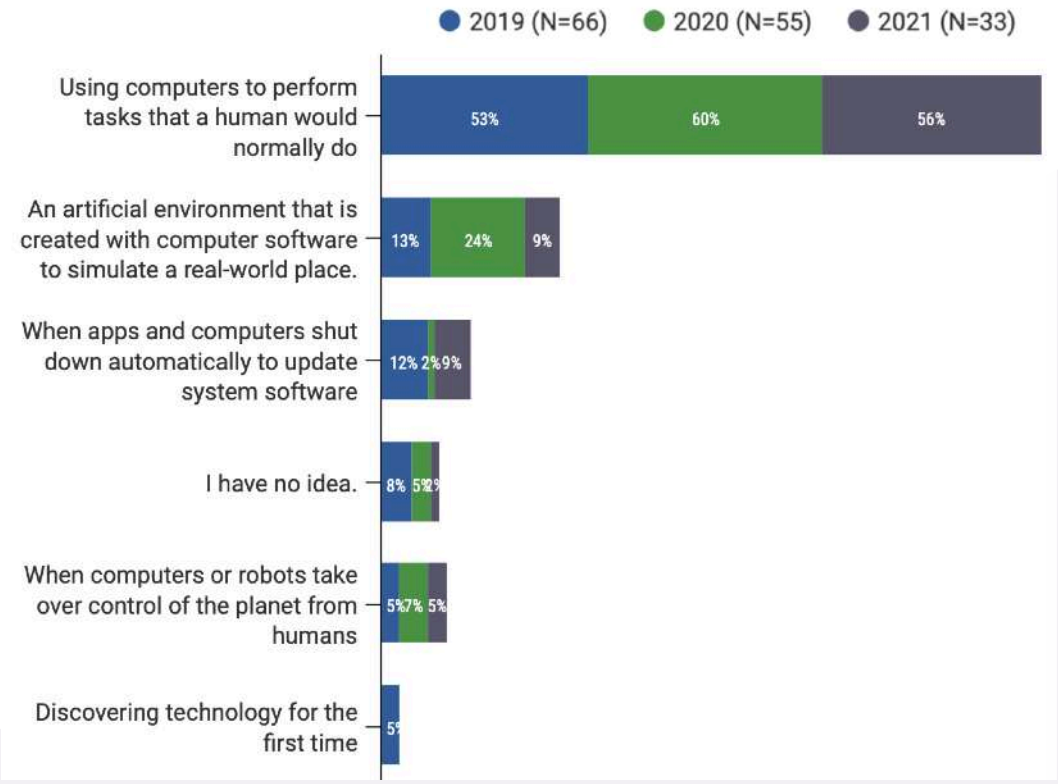
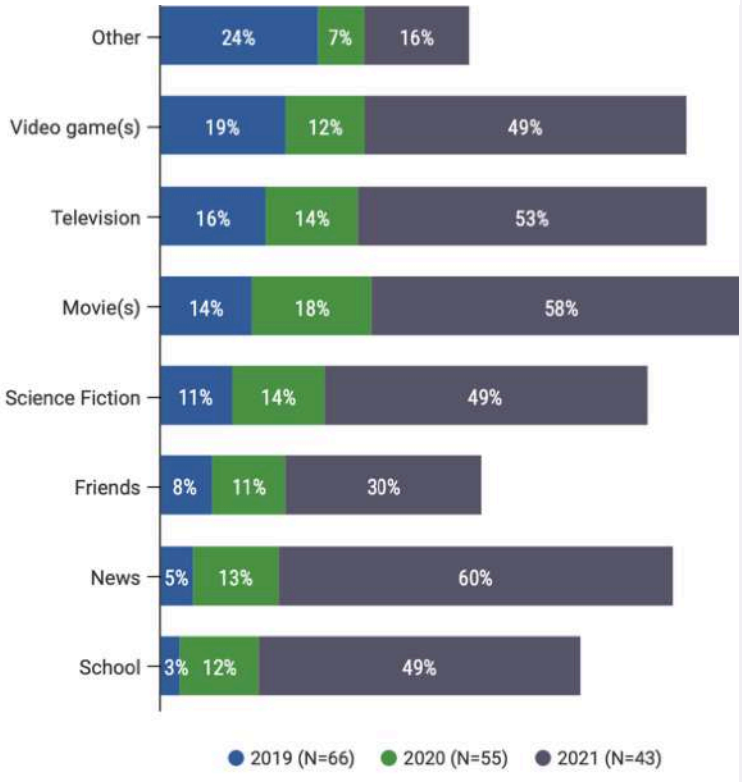


Figure 3: Where have youth heard about AI?



robots used to perform human tasks, machine intelligence, and technology with the ability to learn and improve. Figure 1 shows a word cloud of responses. Words larger in size indicate those mentioned more frequently.

After describing AI in their own words, youth were asked to select the best definition of AI from six options (Figure 2). Across all three years, the majority of respondents selected “using computers to perform tasks that a human would normally do” (2019: 53%, 2020: 60%, 2021: 56%), followed by "an artificial environment that is created with computer software to simulate a real-world place” (13%, 24%, 9%).

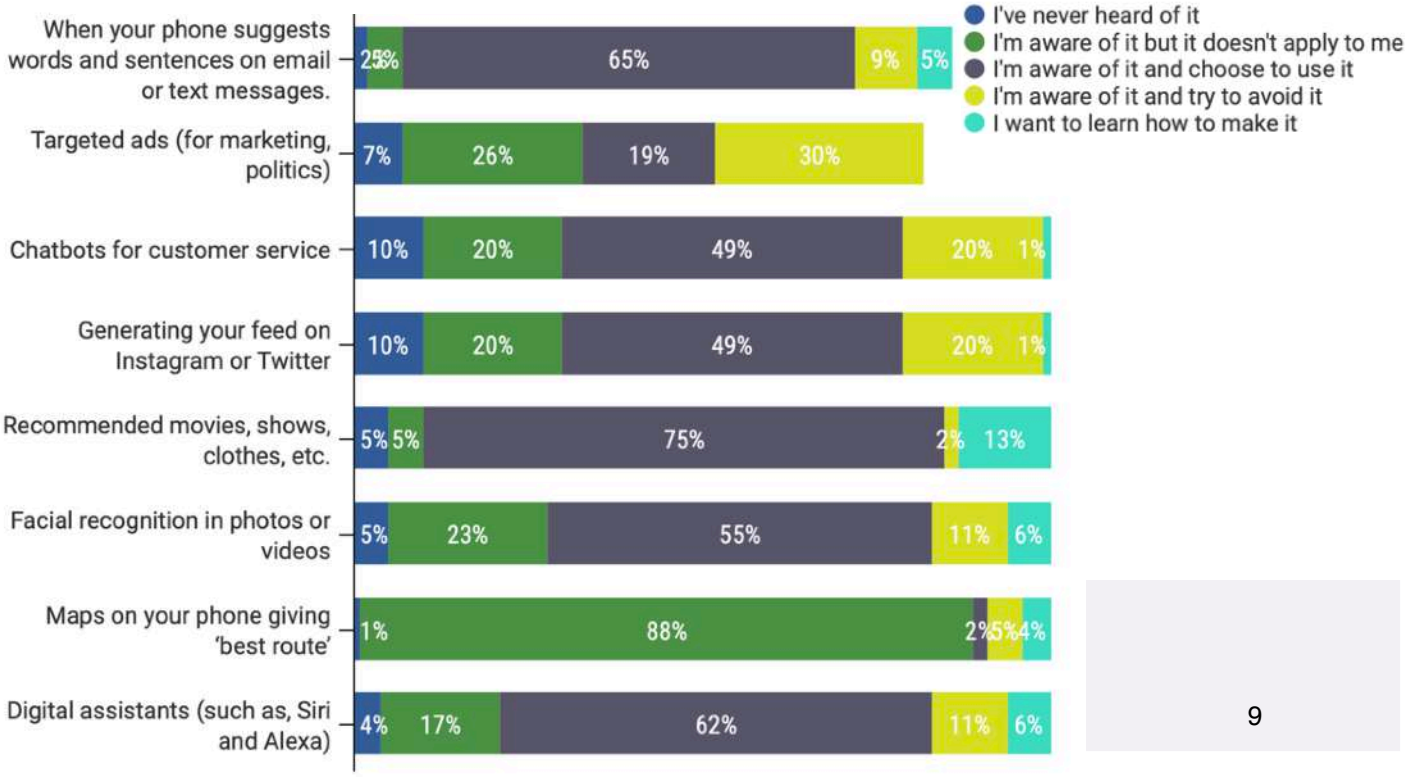
The majority of respondents received the bulk of their information about AI from popular culture, such as science-fiction,

movies, TV, and video games (Figure 2). This creates both challenges and opportunities for learning. Pop culture sources can lead to misperceptions, for instance, inflated notions about the actual advancements of AI technology based on futuristic images in science fiction. Thus, youth may believe that robots can perform higher order human-like tasks than currently possible. In addition, sci-fi movies often accentuate the darker sides of AI or present dystopian futures, which can shape youth assumptions about the potential harms. At the same time, our interviews and observations demonstrated that references and images from popular culture offer productive entry points to introduce and explore social and ethical questions about technology with young people.

Over the course of the project, increasing proportions of youth respondents reported getting information about AI from the news. In 2019, only 5% of students mentioned news sources. This figure jumped to 13% in 2020 and 60% in 2021. These observed changes may reflect increased frequency of news stories about AI, greater youth awareness, or active interest in learning and reading about AI.

Across all three years, youth said that they "choose to use" an array of AI technology applications, including maps giving the 'best route,' predictive text, customer service chatbots, social media "newsfeeds", recommended movies, shows, and other products, facial recognition tools, and digital assistants, such as Siri or Alexa (Figure 4). In contrast, youth consistently indicated that they actively avoided advertising aimed at them for marketing or political purposes. In 2019, 59% said they were aware of targeted messaging and tried to avoid it, dropping to 42% in 2020 and 30% in 2021. Lower rates in 2020 and 2021 may have been due to increased youth engagement in

Figure 4: Youth experiences with AI apps (2021)

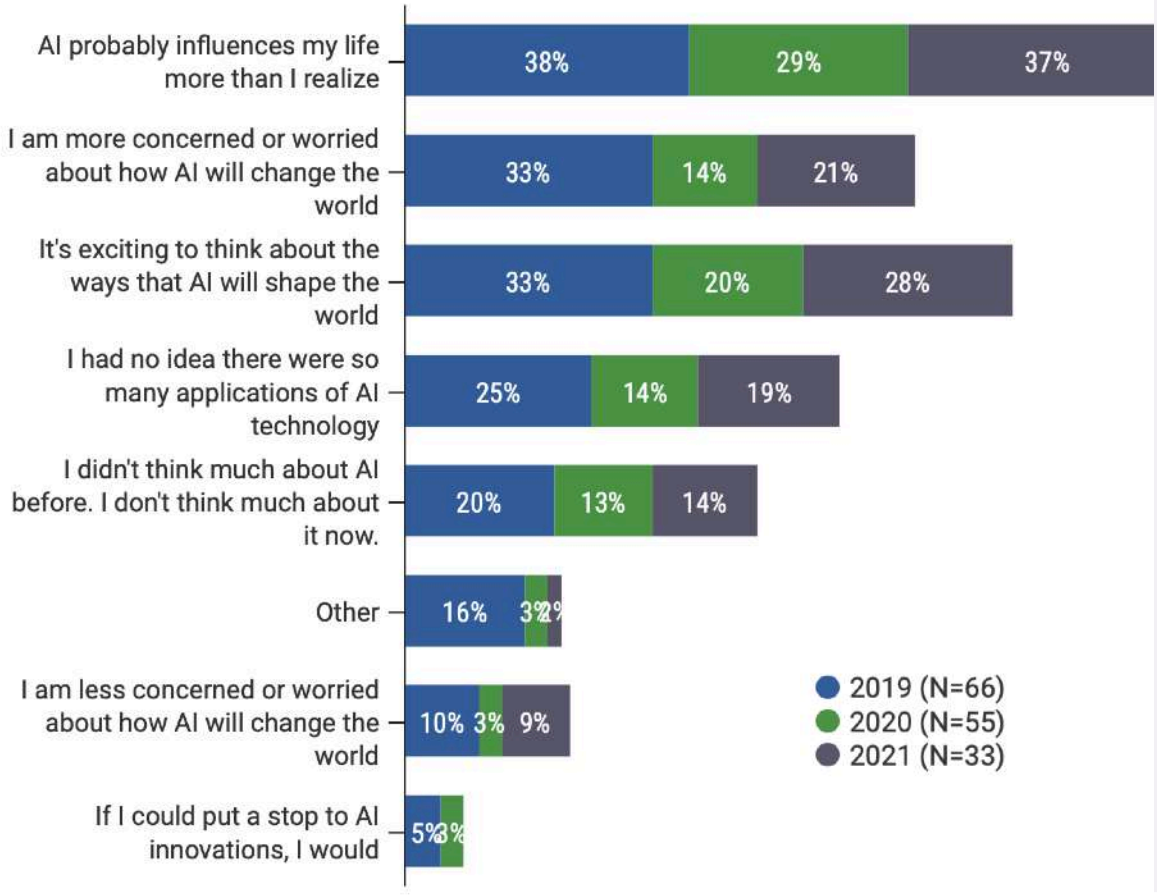


socio-political issues related to the pandemic, social movements such as Black Lives Matter, and the 2020 presidential election cycle. Additional variations in experience with AI apps could be influenced by socio-economic disparities related to accessing smartphones or tablets, variables that may be worth exploring in future studies.

Although many young people sensed that they could not blindly trust AI, they were also often not cognizant of the specific and diverse applications of AI before participating in this project. In our interviews, youth participants expressed feeling surprised by the number of AI technologies built into apps they use everyday. One intern said, "I was shocked by how much we use AI and don't realize it…It's in so many things I use everyday."

In our surveys, after being informed that AI is used in all of the examples included in the previous survey item (e.g. digital assistants, facial recognition in photos/videos, recommended movies or shows, predictive texts, etc.), youth were asked, ***does that change your opinion of what AI is***? Across all three years (Figure 5), a significant number respondents reported having a changed opinion related to the statement, "***AI probably influences my life more than I realize***" (2019 = 38%; 2020 = 29%; and 2021 = 37%), followed by "***I am more concerned or worried about how AI will change the world***" (2019 = 33%; 2020 = 14%; and 2021 = 21%), and "***It's exciting to think about the ways that AI will shape the world***" (2019 = 33%; 2020 = 20%; and 2021 = 28%).

Figure 5: Changed opinion of AI



Hence, for the most part, youth responses illustrated a heightened level of awareness of AI and its impact, in addition to anticipation about AI's broadening influences in their lives. However, they did not necessarily know when they were interacting with AI or understand what if any power they have over growing algorithmic influence.

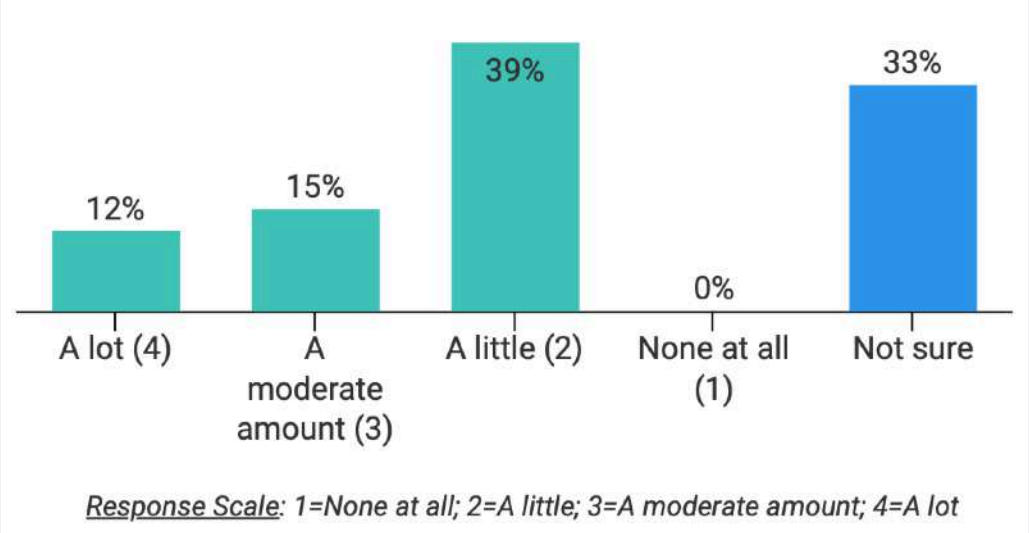
Some youth expressed ambivalence about AI, already knowing about AI, or not being surprised about its influence. One student highlighted its growing influence as reason to learn more about AI: "The wide reach of AI is exactly why we need to learn how to use it and make it."

Others expressed deep concerns about the consequences on people's ability to think critically for themselves. One student recognized "objectively harmful uses of algorithms meant to bring out the worst in people, [while acknowledging] various ways where it's already working positively and more ways we could continue to allow AI to be helpful, transparent, and not demanding to users."

Survey participants were asked how much power they have to decide how they engage with AI (Figure 6). The average mean response to this question was 3 (Mean = 3.00) or *a moderate amount* (1=None at all; 2=A little; 3=A moderate amount; 4=A lot). Most respondents selected "a little" (39%), while approximately a third of respondents were not sure how to answer this question. Some young people reported feelings of fear about AI and its capabilities. One youth expressed paranoia about AI, while recognizing a need to learn more about it:

> *"I'm very paranoid about AI technology and what it could do, but that probably stems from my ignorance and lack of knowledge on the topic."*

Figure 6: How much power do you have to decide how you engage with AI?



When examining responses from all three years, some youth simply expressed the positive aspects of AI:

"It's really cool how this generation is finding lots of ways to use technology to their advantage."

"Less work for humans if robots are doing it."

"I was already quite interested in AI and computer science and I am excited to learn more! I am very techy type of person and it is amazing how AI has grown over the years."

Youth also expressed concerns about both the power and errors exhibited by AI:

"I think I use AI most of the time and I am concerned because what if in the programing there is an error but we think is correct and we will never know unless we investigate and I think we will not investigate because we think AI is "perfect."

"The ad targeting is concerning because that means our activity is monitored and that data could be shared with third parties which isn't very respectful to our privacy haha. I also don't like how some AI (especially on phones) listen in to our daily lives."

"I don't think about AI, but my imagination got away from me and now i'm picturing androids taking over the world. Well, I believe that soon the robots will take over the world only because of movies and things."

A few respondents each year felt either indifferent about AI or did not think that its integration in everyday life was a major cause for concern.

"I've noticed that AI is running my life and I'm more or less okay with it."

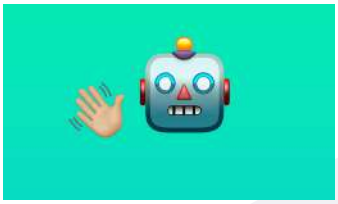
"We are far from AI taking control of everything, so I don't see why we should be worried about it."

Who has a role to play in the future of AI in society?

2021 survey respondents were asked to select (from a list of professions) who has a role to play in the future of AI in society (responses included *important role, minor role, no role,* or *"I'm not sure").* Youth identified data scientists as playing the most important role (89%); followed by computer scientists (80%); designers of digital and real-life media, lawyers who determine what is legal, and journalists (all 57%); and ethicists who analyze fairness with respect to the common good *and* educators (both 49%).

Just 31% of respondents said that artists will play an important role in the future of AI. Between a 1/4 and 1/3 of respondents said that designers of digital and real-life media, artists, educators, journalists, and lawyers will play a minor role.

Workshops to Advance Youth AI Literacy



Building on findings from the AI survey as well as their own conversations and interactions with youth, YR staff and youth instructors developed and tested AI workshops with young people engaged in YR's 6-month core training program in journalism and media production. Youth participants were introduced to relevant historical and background information, open source AI tools, and social-ethical topics.

Activities supported participants to think deeply about the presence of technology in their lives and ways to assert agency over its growing influence. Workshops encouraged youth participants to play around with online tools powered by AI, through creating an AI poem using predictive text, communicating with an AI chatbot, and using an object-recognition drawing app. Exploring fun uses of the technology created a context to discuss the meaning of AI and to critically examine its uses and resulting social and ethical issues, such as privacy and data security concerns.

Young people expressed generally optimistic views about the possibility of AI to bring about positive societal changes. At the same time, youth expressed increased awareness of and concerns about the pervasiveness of AI technology, the discriminatory impacts of AI in practice, increasingly targeted corporate marketing, and a lack of power they feel over the companies developing these new technologies.

Youth participants showed interest in learning more about gender- and race-based biases and discrimination observed in AI and examples of people taking action toward social justice and equity. Youth also learned how to identify and make informed opinions about problematic aspects of AI and how to exert control, even in small ways, over when and how AI influences them.

By supporting young people to pursue complex and meaningful questions about the role and impact of AI on youth communities and to develop their own AI artifacts, youth developed more nuanced understandings about the underlying social-cultural and ethical dynamics.

Youth Media from the Newsroom

YR Media's Newsroom reports on current events from youth perspectives. The STEM Desk focuses on issues related to science, technology, and health. As part of this project, YR published over 50 news stories and commentaries from youth producers in Oakland and around the US. The figure below provides a sample of published artifacts.

Detoxing From Social Media & Spotify's Speech Emotion Recognition AI

'Adult ISH' podcast periodically discussed AI and technology topics. This episode explores young people' relationships with their digital devices, and how these interactions can affect mental health. The co-hosts share what happens when they try to unplug from their screens and social media, and discuss Spotify's patent for speech emotion recognition technology.

Tackling AI's Diversity Gap

As part of a larger series on AI Movers & Shakers, this interview with a youth innovator discusses his motivations for and journey into the field of AI, the importance of broadening participation in technology among youth from diverse backgrounds, and ways that he advocates for Black and Latino students interested in AI.

The Lowdown: Why You Should Fear Facial Recognition

This episode of the Lowdown, a recurring commentary, examines how facial recognition technology is being built into more and more services and environments that we access everyday. It raises questions about risks to privacy, "Is privacy really that dead and gone?" Other YR reporting on facial recognition has looked at how it works in policing and racial discrimination impacts.

AI and Grief: Revisiting Lost Loved Ones on TikTok

This news segment, co-published on NPR's Here and Now, explores how some social media users are experimenting with TikTok filters, such as 'photo animation,' and other AI tools to mourn in new ways and cope with the grief from the loss of loved ones.

Youth Media From the Interactive Department

YR Media's Interactive Department, started over 10 years ago "to create a pathway for students to deepen their knowledge and skills in STEM…equips young people to move beyond being the passive consumers of technology to being critical and active creators" (Lee et al, 2022). The team produces interactive stories combining journalism, design, data, and code. The figure below provides a sample of published artifacts.

In the Black Mirror: What Artificial Intelligence Means for Race, Art and the Apocalypse

This series of interviews between young people and four thought leaders in AI addresses the growing reliance on AI systems and the societal implications on our own agency, decision-making, art making, how we interact with others, and the formation of social identities.

Erase Your Face

To examine potential algorithmic biases in AI, the Interactive team collaborated with Stanford University's d.school to develop a playful interactive explainer that explores how facial recognition AI works, its role in police surveillance, why it's difficult to circumvent this technology, and the discriminatory effects that can occur from its use.

Doing a Double Take: Four DeepFake Scenarios That Mess With Our Minds

This interactive examines the phenomenon of deepfakes, images, audio and video manipulated by AI to create altered content. Presenting four scenarios drawn from actual events, users are tested to see is they can spot the deepfake and pushed to consider the potential consequences.

Surveillance U: Has Virtual Proctoring Gone Too Far

The growth of online proctoring of student assessments is intertwined with developments in surveillance and policing. During the pandemic, universities, colleges and high schools increasingly turned to virtual proctoring services. This interactive highlights key concerns raised by students with virtual proctoring and embedded facial recognition technology, including threats to privacy, increased inequality, and harmful mental health effects.

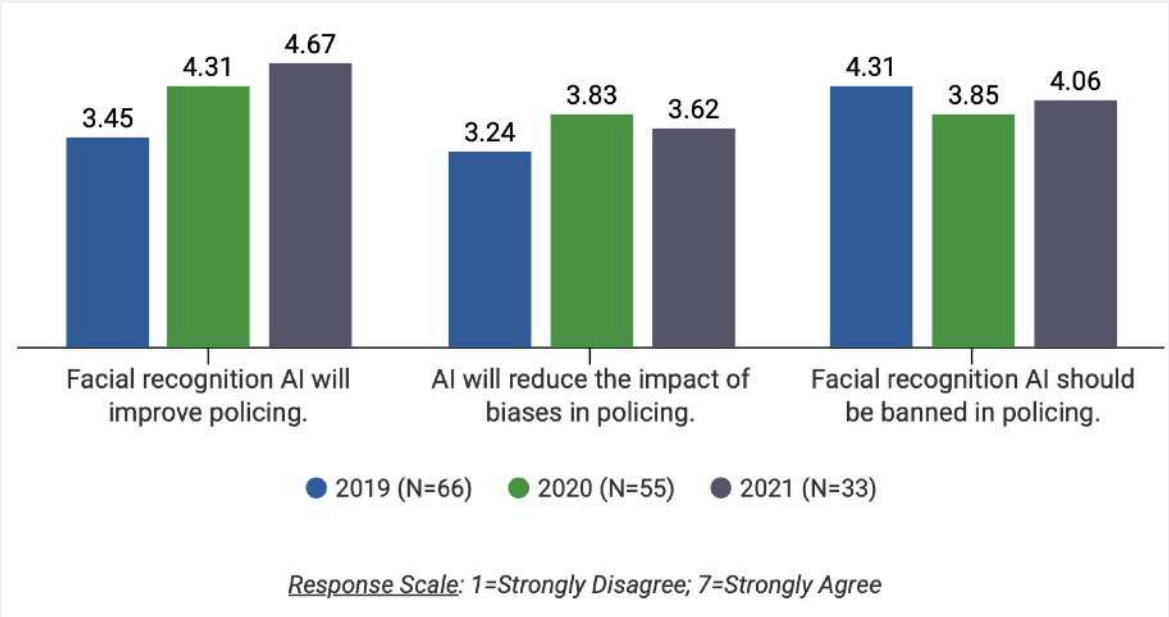
Student Perspectives on the Ethics of Facial Recognition in Policing

In our annual AI youth surveys, young people were asked to respond to several ethics-based scenarios, including facial recognition in policing and public safety:

Police and security services have begun to use facial recognition technology to compare images captured in public spaces against watchlist databases. This means that a person of interest can be picked out of a crowd, whether they are at a public protest, waiting at the airport, or walking down the street.

On a scale of 1-7, with 1 being strongly disagree and 7 being strongly agree, youth survey respondents from all three years tended to slightly disagree that AI will reduce the impact of biases in policing (Mean from 2019 = 3.24; Mean from 2020 = 3.83; Mean from 2021 = 3.62). Additionally, levels of agreement in response to statements "Facial recognition AI will improve policing" and "Facial recognition AI should be banned in policing" fell between slightly disagree (Mean of 3 for slightly disagree) and undecided (Mean of 4 for undecided). Respondents from 2021 tended to agree more than the other two years and facial recognition AI will improve policing (Mean = 4.67). Figure 5 illustrates respondents reactions towards AI's role in facial recognition in policing and public safety.

Figure 7: Student Responses to Scenario on Facial Recognition in Policing



Below we include open-ended youth comments about the use of AI facial recognition in policing and public safety, organized by potential benefits, challenges, and feelings of uncertainty. Youth responses reflect a range of opinions and perspectives on this controversial subject.

The Benefits: Facial Recognition Should Continue

I think facial recognition should continue in AI and be used in the police force. One just needs to remember that it may not be correct - it will just give a second opinion to officers.

I do not think facial recognition AI should be banned in policing because if it is helping the police catch criminals, I think it is fine.

I think if facial recognition will help remove bias and allow the police to locate people quicker, it should most definitely be used in the force.

AI will help find criminals so it is understandable to use it.

The Challenge: Facial Recognition is Biased / Will Not Improve Policing

I believe it should be banned in policing because AI does is not always accurate when it comes to those with darker skin tones.

I don't think facial recognition will be helpful based off of previous video evidence.

Because POC are already getting picked on enough now if they are able to look at someone during a protest and arrest them for some petty charges and "suspect" them for something because of what they've done in the past it will simply get worse.

I believe AI and policing could lead to a slippery slope within society so I wish for it to not fuse unless the benefit of society is greatly guaranteed.

The police are an oppressive organization and giving them tools like this will allow them to stop and harass any person that they choose. Tech like this can only lead to bad things. When I say this will "improve" policing what I mean is that more innocent people will be thrown in jail and largely they will be poor people of color. Tech like this only belongs in the hands of the public, not the government and certainly not the corporations. If the AI data comes from the police it will increase biases in policing.

Current AIs have already shown to have significant bias on gender and race issues. Don't want to give an already problematic police force a tool that could make race issues much worse - at least not until certain improvements are made.

Uncertainty

I am unsure of how this will benefit or not biases.
I need more information to decide.
Like most things it could be used for good and bad.

Exploring AI Ethics: Erase Your Face

YR Media's Erase Your Face interactive tackles the subject of biases in facial recognition AI and invites young people to critically question underlying ethical issues with the technology. Teaming up with the K12 Lab of Stanford University's d.school, the Interactive Department chose to explore the driving question: "*What happens when the algorithms behind facial recognition show evidence of bias*?"

Leading up to this project, the group had been discussing and researching about young people's relationships to AI and machine learning, particularly in the context of technologies that students interact with regularly, such as YouTube, Netflix, and social media algorithms recommending content, predictive text messaging, and facial and fingerprint recognition to unlock smart phones. While learning how algorithms operate and how they make everyday tasks easier, the youth producers became interested in "the scary aspects of what artificial intelligence can become," a YR instructor explained. As students delved into news stories, they expressed concerns and fears:

> *"What happens when this technology gets into the wrong hands? …But I think they've kind of used that fear to be more critical about the spaces they occupy and also the technologies they interact with on the daily."*

After reading Marjerrie Masicat's (2019) Your Guide to Anti-Surveillance Fashion, a story about new fashion, hair and makeup techniques developed to hide oneself from facial recognition technologies, conversations turned the ethics of surveillance and policing methods. At the time, international public debates surrounded Hong Kong protests and the Chinese government's use of AI to identify and monitor protesters. A youth intern said:

> *"All the protests were going on in China and they had cameras that face scan people…pull up their identity. This was in public. It's on the street. You literally couldn't hide if you were outside. So we had talks about it…and tried to say, 'Oh, how can we prevent us being watched 24/7, even when outside?'*
>
> *"That's when we started developing ideas to basically erase our face from the outside world. At first, I thought it was going to be easy, but it was really hard. The facial recognition, it's gotten really advanced. More than I thought. There's different techniques, but it has to be spot on techniques or else you will be recognized."*

The youth producers started to understand the different ways that facial recognition technology is incorporated into our handheld devices and hiding in plain sight. "Everyone has smartphones," said one youth. "It affects everyone in general." While the most

prominent and visible uses were found in entertaining social media apps, the youth team quickly came to the realization that "It's not all Snapchat features."

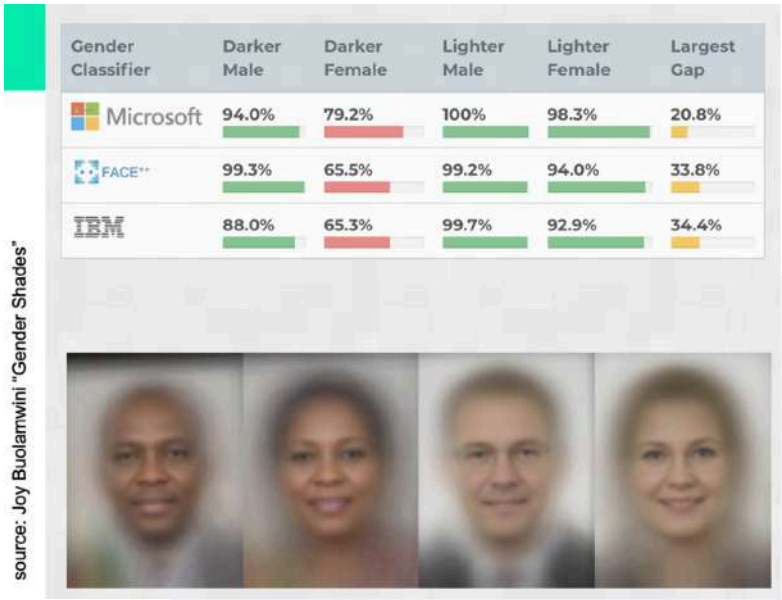


Figure 8: Systematic errors in facial recognition AI with non-white faces

They were shocked to discover that the technology is much less effective with non-white, non-male faces (Figure 8). Two youth interns explained:

"Research has found that [facial recognition] AI is biased towards lighter male faces. Darker skin and female faces, AI gets those more wrong… Only a few cities have banned it. It's only a matter of time for it to go really wrong and hurt people."

"The training data they use is usually mostly from white men, so it's a problem of biased data… The tech sector is mostly white men."

Despite the known biases built into the technology, the youth team observed that most of their peers were not aware or concerned about the potential dangers, underscoring the need to increase education:

> *"My peers aren't against it, what makes people give up is the lack of understanding. Understanding makes it seem like it's bigger than the rest of us."*

To address the biases and systematic errors that have been observed in facial recognition software, the Interactive team designed a drawing tool that would let users test how to evade detection. They devised an online "explainer" that encourages users to play around with trying to avoid being identified, highlighting why and how people choose to avoid surveillance technology.

By grappling with the serious implications of racial and gender discrimination that can result, Erase Your Face sought to empower minoritized youth to reconsider the presence and power of AI in their everyday lives.

EXPLORING AUDIENCE IMPACTS

Source: YR Media

To assess the broader impact of the project, evaluators conducted focus groups and interviews with youth and adult audiences, including students from groups underrepresented in STEM pathways, formal and informal STEM educators, and professionals in Computer Science (CS) and AI. Participants reviewed YR youth-produced media and discussed their perceptions and opinions, focused on several interactive media products: *In the Black Mirror: What A.I. Means for Race, Art and the Apocalypse*, *Erase Your Face*, *Doing a Double Take: Deep Fakes*, and *Surveillance U: Has Virtual Proctoring Gone Too Far?*

Youth Highlight Racial and Gender Disparities and Discrimination

Youth interviews explored young people's feedback and meaning-making related to the youth media products. While most youth participants were not previously aware of the particular social-ethical issues raised, all participants found the YR stories relevant and valuable topics to investigate. Youth of color and female students honed in on how AI can exacerbate existing racial and gender disparities.

Youth observed how AI-enabled social media apps sometimes convey racialized messages about physical beauty. For instance, filters intended to make a user more attractive commonly lighten skin tones or alter facial features in ways that appear more European. "We need to look at what messages are built into this 'fun' filter," explained one youth. "It whitens your skin, narrows your nose, it reduces certain Afrocentric features. The technology blatantly shows biases, if you're looking."

Young people were deeply concerned about law enforcement, pervasive surveillance, and the judicial implications of AI facial recognition,

In the Black Mirror

"It showed a break from the glamorized view of AI…a more realistic view…about **race** and **bias** in AI, and how AI can target individuals."

-College Student

"**AI is as good as the developers who create it and the datasets they feed it.** AI has the capability of silently carrying the developers' **biases** and applying them on a large scale…The effect could be **catastrophic in certain use cases**, such as, security, crime prevention and enforcement, fraud detection, loan and mortgage decision making, job pre-qualification, job interviews."

-High School CS Teacher

"**Who is benefiting from AI?** Students should be challenged to approach much of their study of the unexamined bias lurking in the results of these tools through this lens."

-High School CS Teacher

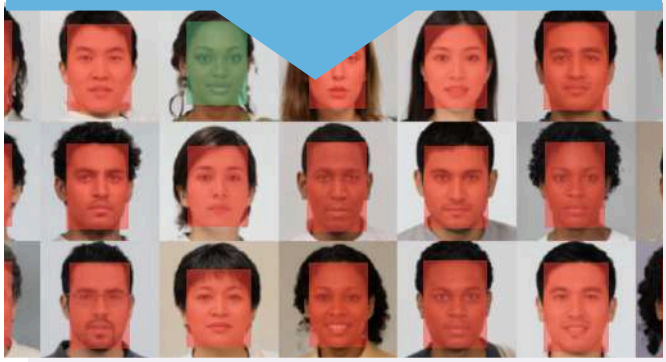
including inadvertent effects or intentional abuses of the technology, data privacy issues, and tracking tools used to generate targeted advertising or political messaging. While recognizing that AI presents an opportunity to reduce human error in police discretionary decision-making, youth generally believed that the known and unknown negative consequences from programmed errors warrants limiting or banning automated police surveillance, at least until digital discrepancies and biases can be resolved. Some youth reported feeling somewhat helpless about harmful or intrusive technology. At the same time, participants believed that identifying ethical issues was a key step to challenging the status quo. The majority of participants wanted more solutions-oriented information to help understand what they can do to protect themselves.

Erase Your Face

"I learned about how facial recognition works and how face IDs are made…It made me interested…made me like AI a little bit more..because of the benefits that it could have with investigating crimes." -High School Youth

"I assumed that concealing the eyes would reduce the match percentage below 80%. In order to get below this threshold, I had to conceal nose, mouth and chin as well… This suggests that many photos uploaded to social media are providing matches without informed consent." -H.S. Science Teacher

"Out of all AI biometrics, facial recognition is the least reliable…There's so many issues with privacy and consent…because of how easy it is to record people in public… Most troubling for me is the racial biases and potential impact that can have…particularly for Black women… Given how serious the consequences are in policing, I think it should be banned or seriously limited." -Computer Scientist



Teachers See Need to Delve More Into AI Ethics with Students

Educator interviews focused on the relevance of the youth-produced media within their own teaching context, any experiences teaching students about the social or ethical issues of new technologies, and the potential instructional applications in the classroom. Although most participants were aware of the ethical issues of AI in a general sense, few had in-depth knowledge of the systematic biases and discriminatory impacts of the technology.

Several teachers, including a CS/technology teacher who works with mostly youth of color, had never thought about the ethical dilemmas of AI before. One teacher, who described YR Media's work as a resource to "broaden your knowledge on the impact of technology on today's society," said she was "shocked" and did not know about the racial biases in AI. After reviewing the interactive, she realized that racial biases in tech affects her students and needs "to be more mindful to protect them [from discrimination]."

Another CS teacher described the importance of incorporating ethical discussions into learning:

> *"I believe it is crucial that students are introduced to the ethics of artificial intelligence, its shortcomings, as well as its potential to improve human life if applied within the proper legal, ethical, and technological framework."*

In contrast to youth interviews, however, teachers were slightly less open to the idea of critically exploring unknown or unfamiliar terrain in the classroom. In addition, some teachers were concerned that the YR stories were overly critical of the educational institutions' use of AI technology in online proctoring, wanting to hear the perspectives of school administrators, alongside student and teacher accounts.

All but one of the teachers expressed interest in incorporating the youth media in their own teaching or sharing this work with colleagues. In particular, CS teachers were excited by the idea of using the stories to explore the social and cultural dimensions of technology and to discuss students' everyday uses of AI and other technology, which they may not be aware of. The teachers believed their students would be drawn to this media, which reflect young people's voices and experiences and present authentic youth perspectives.

Doing A Double Take: Deepfake Scenarios

"Deepfakes aren't just funny videos…It feels like there's actually more harm it can do than good.

-High School Student

"I'm not sure if I'd be able to recognize deep fakes… This [interactive] informed me on the **dangers of deepfakes**…I want to know more about how someone can deepfake you and take advantage of you and how you can protect yourself."

-College Student

"I can see using 'Deepfakes' to educate my students on the importance of digital citizenship. Each day technology is becoming more and more sophisticated, and it's harder for students, and people in general, to determine what's real and what's fake. Some of the examples provided would be helpful to make students understand the technology available, and the lengths scammers will go to deceive people."

-Middle School STEM Teacher

CS teachers admitted feeling less confident examining social-ethical issues than the technical aspects of computing. Although there are expectations that CS courses include ethics-related topics, these typically receive limited attention in comparison to teaching students how to write and iterate code. In addition, formal classroom teachers had concerns about where and how to integrate YR's resources within the curriculum, especially given mounting academic expectations and testing mandates. As one teacher put it: "It feels like there's no extra room to add more lessons…yet,

Surveillance U

"I keep thinking about how stressful it is just to make sure the computer knows you are not cheating. Testing is already stress-inducing…not to mention how the technology can't read dark skin."
-College Student

"It's think it's cruel to use online surveillance in testing. It treats all students like criminals."
-College Student

"This topic is a big juicy hook for students." -High School CS Teacher

"Virtual proctoring is a great way to introduce the topic, because it has a clear and direct impact on students' lives in and outside of school
-H.S. Technology Teacher.

"Online Proctoring is most relevant to my students. My colleagues were really concerned about cheating during the pandemic. I chose to create assessments that could be done 'open book.' Other teachers developed strategies that were crazy. Cameras on. Surveilling students. Too much intrusion… It's not worth it to police students. I prefer to talk with them about principles of integrity. Remind students to work alone and honor the rules. I'd rather have a kid who cheats and gets away with it, than students believe I see them as a cheater when they're not."
-H.S. Math Teacher

every year it seems like there are new requirements we have to teach or some new approach to learn." Regardless of adoption, the teachers believed that the youth-produced media helped them to be aware of an array of often unseen AI-related issues affecting young people.

Computer Scientists Advocate for Ethics Integrated into AI Education

Expert interviews examined participants' opinions and perceptions of the relevance of YR media products to their professional context. All participants found the media informative and accurate. All participants were aware of the ethical issues presented, although none of them specialized in the ethics of AI. The concept of general AI is a highly ambitious challenge: developing AI systems that are capable of learning from the environment and applying decision-making to a variety of tasks.

Despite significant advances in technology made in the past decade, developers are still a long way from realizing this goal. As one participant said, "Even the most advanced robotics and AI systems are currently still kind of dumb when compared to humans."

Nonetheless, the broad applications and growing role of AI in essentially all sectors of society compel AI developers and leaders to consider the inherent risks as well as the opportunities. Interviewees recognized the importance of young people understanding the complex risks, not just the rewards of AI. Two computer scientists said:

"I get excited about technological advances and thinking about what changes we might see in the near future. Self-driving cars. Medical breakthroughs. I tend to gravitate towards those stories… YR Media's stories remind me that how

important it is to think critically about who benefits and who's being harmed."

"AI has so many exciting possibilities. It's amazing how far we've come with language processing, for example. It's been incorporated into so many things we use everyday that can make people's lives easier, more productive… But, on the other hand, we've seen AI copy the worst parts of humans and accentuate it… Look at the Twitter chatbot experiment a few years ago. It only took about a day for the AI to learn from Twitter posts and turn into a raging racist, just by reading people's posts."

Several interviews noted that popular literature and news accounts of AI often tend to focus mainly on either the supposed benefits to society or the dangers of AI technology. In reality, a computer scientist argued, "The future of AI is most likely neither as rosy or as apocalyptic as it sometimes gets presented."

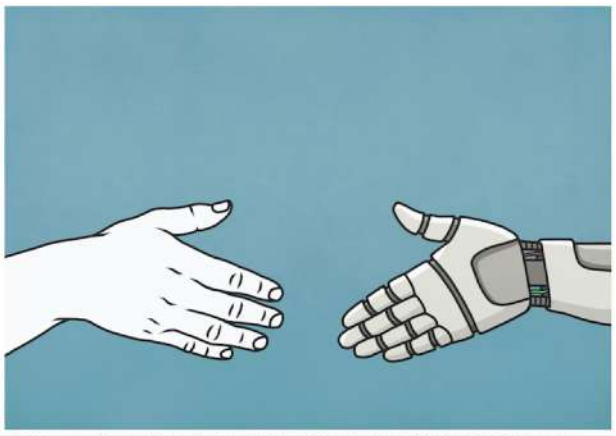
In contrast, interviews suggested that educational approaches should take a comprehensive look at AI, accounting for a range of scientific, engineering, social, and ethical considerations. Interviews stressed the importance of integrating ethics in AI education. Alongside learning computational practices in AI development, students should be exposed to ethical debates, theoretical frameworks, and methodologies to navigate potentially contentious questions. A web developer maintained:

"Computer science programs do usually address the ethics of technology development in some way, but it's not always a big focus…I think we need to integrate more of what YR Media is talking about…the ethical and societal ramifications of AI and other technologies, so that students learn to consider the potential drawbacks and how to make AI responsibly."

There was consensus across interviews that YR media products offer engaging stories to introduce ethical issues in AI through youth perspectives and experiences. Participants identified the importance of trustworthy media sources that are produced by and for young people. The products spotlight issues of broad public concern and highlight AI stories from youth perspectives. YR Media resources were viewed as a means to capitalize on students' interests in and experiences with technology and to engage young people in thinking deeply about how AI, as well as their own beliefs and values about technology, are historically and culturally situated.

CONCLUSION

In a world that is increasingly infused with and shaped by rapidly emerging AI-enabled technologies, young people need to acquire the knowledge and skills to navigate this changing landscape. One need not dig deep to start seeing the ways that everyday cultural practices are connected to and shaped by AI. However, many users are unaware when they are interacting with AI algorithms or how digitally-mediated environments are influenced.



Source: Malte Mueller/Getty Images (via YR Media)

As machine learning progresses and the role of AI continues to grow across a wide range of fields, AI applications are likely to deeply affect individuals and organizations across sectors of the economy. Alongside technological advancement, it is vital to understand the complex intersections between AI and ethics and to help youth navigate human-computer interactions.

By combining journalism, social science and participatory methods with design principles and coding, YR Media leveraged the power of human collaboration, interdisciplinary creativity, and equity-centered thinking with technologies new and old (e.g. Lee et al, 2022; Soep & Lee, in press). This project sheds light on the complexities and implications of participatory learning communities and action-oriented approaches to foster critical literacy in AI. YR's research and this evaluation illustrated the viability of adapting "computer science education to embed computational thinking inside a youth-driven newsroom where content is tethered to truth, aimed towards justice, shared with the public, and brought to life through creative expression" (Lee et al, 2022, p. 3).

By positioning youth as co-creators working with their peers and STEM media professionals, YR Media provided opportunities for young people to engage in a learning community connecting computational expression to civic participation. Through informal STEM pedagogy that consciously centers young people's interests and lived experiences with technology, YR Media engaged youth in learning to research and create digital media to tell meaningful, fact-based stories that address real world technological changes affecting underrepresented youth communities.

Citations

Janna Anderson, Lee Rainie, and Alex Luchsinger. 2018. Artificial Intelligence and the Future of Humans. Washington, DC: Pew Research Center

Bandy, E., & Bass, K. (2009). Youth Radio science and technology program evaluation. [Final report]. San Francisco: Rockman et al.

Borenstein, J. & Howard, A. (2021). Emerging challenges in AI and the need for AI ethics education. AI Ethics, 1, 61–65.

Cope, B., & Kalantzis, M. (2005). A pedagogy of multiliteracies designing social futures. In Multiliteracies: Lit Learning (pp. 19-46). Routledge.

DiPaola, D., Payne, B. H., & Breazeal, C. (2020). Decoding design agendas: an ethical design activity for middle school students. Proceedings of the Interaction Design and Children Conference, (pp. 1–10).

Feuerriegel, S., Dolata, M. & Schwabe, G. (2020) Fair AI. Bus Inf Syst Eng, 62, 379–384. https://doi.org/10.1007/s12599-020-00650-3.

Gurn, A.G., Bass, K., Hazer, J. (2017). STEM media that matters: Summative evaluation of Youth Radio's Innovation Lab. San Francisco: Rockman et al.

Hazer, J. & Bass, K. (2014). Youth Radio's DO IT! initiative: Summative evaluation. San Francisco: Rockman et al.

Ito, M., Baumer, S., Bittanti, M., Boyd, D., Cody, R., Herr-Stephenson, B., Horst, H.A., Lange, P.G., Mahendran, D., Martìnez, K.Z. and Pascoe, C.J. (2010). Hanging out, messing around, and geeking out. Cambridge, MA: MIT Press.

Lee, C., Gobir, N., Gurn, A., & Soep, E. (2022). In the Black Mirror: Youth Investigations into Artificial Intelligence. ACM Transactions on Computing Education. https://doi.org/10.1145/3484495

Lee, C. & Soep, E. (in press). Code for What? Computer Science as a Medium for Storytelling and Justice.

McKinsey Global Institute (2018). The promise and challenge of the age of artificial intelligence. McKinsey & Company. Available at: https://www.mckinsey.com/featured-insights/artificial-intelligence/the-promise-and-challenge-of-the-age-of-artificial-intelligence

NCTE (2013). 21st Century Literacies Framework for Curriculum and Assessment. Available at: https://cdn.ncte.org/nctefiles/resources/positions/framework_21stcent_curr_assessment.pdf

Ptaszek, G. (2021). Media Education 3.0? How Big Data, Algorithms, and AI Redefine Media Education. In The Handbook on Media Education Research, eds. Divina Frau Meigs, Sirkku Kotilainen, Manisha Pathak-Shelat, Michael Hoechsmann, Stuart R. Poyntz, New York: Wiley- Blackwell. Available at: https://www.researchgate.net/publication/333381624

Silberg, J. & Manyika, J. (2019). Notes from the AI frontier: Tackling bias in AI (and in humans). McKinsey Global Institute. Available at: https://www.mckinsey.com

Solomon et al (2020). History of Logo. Proceedings of the ACM on Programming Languages, 4, 1–66.

Touretzky, D.; Gardner-McCune, C., Martin, F., and Seehorn, D. (2019). Envisioning AI for K-12: What should every child know about AI? Proceedings of the AAAI Conference on Artificial Intelligence, 33(01): 9795–9799.

Yin, R.K. (2009) Case Study Research: Design and Methods. Fourth edition. Sage Publications: Thousand Oaks, CA

West, D. & Allen, J. (2018). How artificial intelligence is transforming the world. Brookings: Center for Technology Innovation. Available at: https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/

Appendix I: Evaluation Methods

Rockman et al, an independent research and evaluation cooperative, conducted an external evaluation of the Understanding AI (UAI) project to examine both the implementation and outcomes and to provide formative recommendations towards the project's goals. This evaluation extended previous independent analyses of informal STEM learning at YR Media and with diverse audiences using the youth-created media (e.g., Bandy, & Bass, 2009; Hazer & Bass, 2014; Gurn, Bass & Hazer, 2017; Gurn & Bass, 2019). The evaluation considered changes in youth participants' understanding of AI, youth perspectives on the ethical dimensions surrounding AI applications, pedagogical processes developed to engage youth in critically exploring AI, and target audience feedback on AI artifacts produced by youth.

The key research questions guiding the project and the external evaluation were:

RQ1: *What do young people who are underrepresented in STEM understand (and misunderstand) about AI and its role in society, and what are their urgent questions related to AI in their lives and futures?*

RQ2: *What are the biggest ethical dilemmas posed by AI from the vantage point of underrepresented youth?*

RQ3: *What are the features of an ethics-centered pedagogy and set of consequential learning activities that promote STEM engagement via AI?*

RQ4: *What impact do the AI products and content young people develop have on target audiences, including underrepresented youth and formal and informal educators?*

The evaluation employed multiple methods. Findings from extended interviews, focus groups, youth surveys, observational field notes, and analyses of youth-produced artifacts were combined to explore the development of AI literacy, strategies to engage youth in AI-related learning, and the relevance of AI to their lives and communities.

Evaluation activities included:

- ***Annual Youth AI Survey***, designed in collaboration with YR Media and implemented to examine YR youth participants' background knowledge, perceptions and opinions about AI technology and AI ethics. Prior to baseline and pilot administration, survey items were informally tested with YR-affiliated and non-YR-affiliated students. The survey questions asked what young people knew about AI, its role or functions in society, and its impact on themselves and others. The survey was administered to all YR Media youth participants in 2019, 2020, and 2021. Due to IRB-related decisions, responses were unmatched and anonymous. Therefore, results cannot be read as pre-and-post impact data. In each administration, a large number of young people who

completed surveys were new to the program. For these reasons, changes in survey findings across years do not necessarily indicate growth as a result of the UAI project.

- *YR youth focus groups and interviews* to explore what youth participants were learning and producing, thoughts on the program and how it could be improved, as well as their attitudes toward and interest in AI and STEM.
- *Staff interviews* to examine educators' experiences and feedback, as well as observed impacts on youth learning.
- *Observations* of YR Media workshops to see the process of youth engagement and skills development.
- Review of *youth media products* for evidence of AI literacy and STEM practices.
- *Audience focus groups and interviews* to explore educators', young people's, and experts' perceptions of and feedback on youth-produced media. Youth interviews explored participants' experiences with AI, perceptions of the media products, and their questions and opinions on the ethical issues raised. Educator interviews primarily explored classroom connections, teaching applications and instructional adaptations. Interviews with CS and AI professionals examined their thoughts on the significance of the youth media, relevance to the field, and the potential implications.

Interview transcripts, surveys, and researcher field notes were coded thematically using the constant comparative method (Charmaz, 2008). Research memos were used to communicate emergent thinking, raise questions, and develop analytic codes and categories triangulated across data sources. Practitioner researchers at YR Media and Rockman evaluators met periodically to discuss program strategies, key challenges, project outcomes, and theory building.

Evaluators considered the data generated in the study to relevant science education frameworks, such as the K–12 Computer Science Framework (2016) and NCTE's (2013) 21st Century Literacies Framework, and ISTE's (2021) Computational Thinking Toolkit, literature on social and ethical dimensions of AI development and AI educational approaches, as well as the results of prior internal research and external evaluation on YR Media, in order to situate the analysis in a broader context.

Appendix II: YR Media's Artificial Intelligence (AI) Youth Survey

Q1) Dear YR Media member,

This is YR Media's Artificial Intelligence (AI) Survey, to help understand what you know about AI, its role in society, and its impact on you. Your feedback will help improve YR's reporting and resources on AI. At the end of the survey, you will receive a pop-up with links to relevant stories.

The survey is anonymous, so your responses will not be connected to your identity, unless you share personal information in your responses. Personally identifying information will be anonymized in any reports or publications.

Thank you for taking as much or as little time as you choose to complete the survey. Participation is voluntary. You may skip any questions or stop taking the survey at any time. If you have questions or difficulties with the survey, or you want to find out more about the research, please contact:

~Alex Gurn (he/his) Rockman et al I Ph: [redacted] I email: alex@rockman.com

~[redacted] (she/her) YR Media I Ph: [redacted] I email: [redacted]

*If you have questions about the rights of survey participants, you can contact Solutions IRB. They are an impartial ethics review board. Contact them by phone at [redacted] or by email at [redacted].

Q2) What is your current position at YR Media?

- o Core student
- o Bridge student
- o Intern
- o Project Associate (PA)
- o Other _____

Q3) [IF Bridge selected] Which Bridge track are you in?

- o Journalism
- o Music
- o Multimedia

Q4) [IF Intern or PA selected] What is your most recent Department?

- o Newsroom
- o Peer Teacher / Media Ed
- o Health Dept.
- o Tech Dept.
- o Interactive Dept / YRI
- o Video
- o Web Radio
- o CHEF/Kitchen
- o Remix Your Life
- o Communications

Q5) What race/ethnicity do you identify as?

- ☐ White
- ☐ Hispanic or Latino
- ☐ Black or African American
- ☐ Native American or American Indian
- ☐ Asian / Pacific Islander
- ☐ Other: _____
- ☐ I prefer not to answer.

Q6) What gender do you identify as?

- ☐ Male
- ☐ Female
- ☐ Genderqueer/Non-Binary
- ☐ Other: _____
- ☐ I prefer not to answer.

Q7) Please define or describe Artificial Intelligence (AI) in your own words.

_____
_____
_____
_____

Q8) Pick what you think is the best definition of Artificial Intelligence (AI)

- o When apps and computers shut down automatically to update system software
- o Discovering technology for the first time
- o When computers or robots take over control of the planet from humans
- o Using computers to perform tasks that a human would normally do
- o An artificial environment that is created with computer software to simulate a real-world place.
- o I have no idea.
- o None of the above _____
- o I prefer not to answer

Q9) On the last question, let's assume the most accurate definition of AI is: 'Using computers to perform tasks that a human would normally do.' AI refers to the development of technology designed to mimic human intelligence. This field of computer science is dedicated to “training” machines to think and learn, with a focus on problem solving.

Q10) Besides this survey, where have you heard about AI? please add info, if you like.

- ☐ School or classes (1) _____
- ☐ News (2) _____
- ☐ Friends (3) _____
- ☐ Science fiction (4) _____
- ☐ Movie(s) (5) _____
- ☐ Television (6) _____
- ☐ Video game(s) (7) _____
- ☐ Social media (8) _____
- ☐ Other, please explain: (9) _____

Q11) What's your level of experience with the following AI technology applications? For each example, select all statements that apply.

	I've never heard of it	I'm aware of it but it doesn't apply to me	I'm aware of it and choose to use it	I'm aware of it and try to avoid it	I want to learn how to make it
Digital assistants (such as, Siri and Alexa)	☐	☐	☐	☐	☐
Maps on your phone giving 'best route'	☐	☐	☐	☐	☐
Facial recognition in photos or videos	☐	☐	☐	☐	☐
Recommended movies, shows, clothes, etc.	☐	☐	☐	☐	☐
Generating your feed on Instagram or Twitter	☐	☐	☐	☐	☐
Chatbots for customer service	☐	☐	☐	☐	☐
Targeted ads (for marketing, politics)	☐	☐	☐	☐	☐
When your phone suggests words and sentences on email or text messages.	☐	☐	☐	☐	☐

Add your own:	▢	▢	▢	▢	▢

Q12) All of the applications in Question 4 above use AI. Does that change your opinion of what AI is? (Select all that apply.)

- ☐ I didn't know there were so many applications of AI technology.
- ☐ AI probably influences my life more than I realize.
- ☐ It's exciting to think about the ways that AI will shape the world.
- ☐ I am more concerned or worried about how AI will change the world.
- ☐ I am less concerned or worried about how AI will change the world.
- ☐ I didn't think much about AI before. I don't think much about it now.
- ☐ If I could put an end to AI technology, I would.
- ☐ Other. Please add: _____

Q13) Would you like to explain your response above?

_____

In the next few questions, we present different scenarios related to AI. As you read, please consider how you feel about this use of technology, its potential benefits, and possible harms.

Q14) ***Scenario 1: Searching for Missing and Exploited Children***

In recent years, technology companies have created apps that help local and international agencies identify and find children who are missing or trafficked online. The International Center for Missing and Exploited Children developing a software engine that uses AI facial recognition technology to search for images matching the faces of missing children. The system also communicates with people in geographic areas where specific children are believed to be missing. The engine takes over advertising space on geographically-targeted websites, replacing a commercial ad with a missing child alert.

	Strongly disagree	Disagree	Slightly disagree	Undecided	Slightly agree	Agree	Strongly agree
	1	2	3	4	5	6	7
AI will improve efforts to find missing children.							
Facial recognition AI may work less effectively to locate children of color.							
AI should be developed and used to locate missing people.							

Q15) Please explain or question any part of your thinking above._____

Q16) Scenario 2: ***FACIAL RECOGNITION in Policing and Public Safety*** Police and security services have begun to use facial recognition technology to compare images captured in public spaces against watchlist databases. This means that a person of interest can be picked out of a crowd, whether they are at a public protest, waiting at the airport, or walking down the street.

	Strongly disagree	Disagree	Slightly disagree	Undecided	Slightly agree	Agree	Strongly agree
	1	2	3	4	5	6	7
Facial recognition AI will improve policing.							
AI will reduce the impact of biases in policing.							
Facial recognition AI should be banned in policing.							

Q17) Please explain or question any part of your thinking above._____

Q18) ***Scenario 3: Humanoid Robot Creates Art Exhibited in Museums***

There's a new art exhibit opening at a museum in your town. You decide to check it out. While walking around, you stumble upon the work of an artist you've never heard of before, named Ai-Da. Her work speaks to you, and you decide to look her up, only to find out: she's a robot! Constructed by a team of engineers, Ai-Da uses facial recognition technology to analyze images and provide data for an algorithm that directs the movement of a robotic arm used to produce drawings, paintings, and sculptures.

	Strongly disagree	Disagree	Slightly disagree	Undecided	Slightly agree	Agree	Strongly agree
	1	2	3	4	5	6	7
Art produced by AI has no place in a museum.							
As an artist, you can use AI and call what you make art.							
If AI played a role in making a work of art, the artist should disclose that information when presenting the work. Otherwise, they are misleading their viewers.							

Q19) Please explain or question any part of your thinking above._____

Q20) Who has a role to play in the future of AI in society? (Select all that apply.)

	Important Role (1)	Minor Role (2)	No Role (3)	I'm not sure (4)
Designers of digital & real-life products	▢	▢	▢	▢
Artists who create visual & performance art	▢	▢	▢	▢
Computer Scientists who build products using code	▢	▢	▢	▢
Data Scientists who collect & analyze information to make decisions	▢	▢	▢	▢
Ethicists who analyze fairness with respect to the common good	▢	▢	▢	▢
Lawyers who determine what is legal	▢	▢	▢	▢
Journalists who report and comment on the news	▢	▢	▢	▢
Educators who teach in and out of schools	▢	▢	▢	▢
Other	▢	▢	▢	▢

Q21) Please explain any part of your responses above.

_____

Q22) How much power do you have to decide how you engage with AI?

- o A lot (1)
- o A moderate amount (2)
- o A little (3)
- o None at all (4)
- o I'm not sure (5)

Q23) What additional questions or ideas do you have about AI?

_____