Event: #8033 ‑ AccessGA webinar

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>> Johan Rempel: Good morning, everyone. This is Johan Rempel from center for inclusive design and innovation. We're going to get started in about a minute or so. We're going to give people a little more time to join the room.

So, just give us another minute.

Thank you.

>> Johan Rempel: Good morning, everyone. This is Johan Rempel from center for inclusive design and innovation. Thank you for joining us this morning. The webinar today is the artificial intelligence revolution: Are people with disabilities being left behind?.

I have the privilege of co-presenting today with John Toles. Before we jump into the presentation we have some housekeeping items to ensure you are there receiving this and it is accessible.

We are providing live captions today. Thank you to heather our captionist. There are two ways in which you can access captioning. One is through the StreamText link. It should be available in the chat. If you can access that. The second way is through the closed captioning options on your Zoom toolbar. In this case I have a bright red arrow pointing to the CC or the closed captions. That's also keyboard accessible. That can be tabbed to as well.

We also provide ASL interpreting as well. Thank you to our ASL interpreter today. She is being spotlighted. If you are not seeing her, consider changing your view to speaker view and you should be seeing the PowerPoint slide and our ASL interpreter.

And then there's also the pinning options available in Zoom as well. I'm hearing an open mic. If I can ask everyone to mute.

Appreciate it. Pinning is an individual preference on the user's end. Because it's being spotlighted today, the ASL interpreter is made available for everyone.

We are using the highly accessible Zoom platform today. It's highly accessible for various disabilities.

This is being provided today and funded through the AccessGA project.  
AccessGA is a joint project of   
the State ADA Coordinator’s   
Office – Georgia State Financing   
and Investment Commission

Also known as GSFIC. Headed by Stacey Valrie Peace. Thank you to Stacey and your team for supporting this initiative. And partnership with  
Georgia Technology Authority

And CIDI,  
And Georgia Tech's Center for   
Inclusive Design & Innovation

The purpose of AccessGA is to support  
State of Georgia agencies with   
Information and Communication   
Technology accessibility,   
promoting equal and timely, also known as ICT.  
access for employees and   
customers with a wide range of   
disabilities.

And a little overview of center for inclusive design and innovation. We are housed at Georgia Tech under the College of Design. We have decades of experience in service and research and our mission is to improve the human  
through equal access to   
technology‑based and   
research‑driven information,   
services, and products for   
individuals with disabilities.

We have approximately 65 employees and pretty much everything we do and touch is disability related or accessibility related. Some of the services we provide are braille services. We have a large contract with the library of Congress. Our braille unit is one of the largest in the country and provides braille services to various organizations and educational institutions throughout the country. Our e‑text department  
Provides high‑quality e‑text in   
many formats such as PDF, DOC,   
DAISY, Excel, PowerPoint, and   
HTML.

And we also have a  
Captioning and Audio Description

Department that  
Makes classrooms, meetings, labs   
and other audio environments   
fully accessible for deaf or   
hard‑of‑hearing, including   
remote captioning and captioned   
media.

And thank you to Heather today our captioner who is providing live captions today.

Our Tools for Life unit. We have a privilege of overseeing the  
Georgia’s Assistive Technology

Act for Georgia. And providing full access for individuals in their living, learning and working and playing environments.  
Accessibility Compliance, Best   
Practice and User Experience:

We look at usability, training, and comprehensive evaluations.

As a research institute we have several research scientists who focus on disability and accessibility. With that I will pass it on to John Toles to introduce himself.

>> John Toles: Thank you. I'm an ICT accessibility specialist with CIDI. I will be giving an overview of large language models today. At CIDI I provide web accessibility evaluations and technical help around digital accessibility. I've been with CIDI since 2016. I originally worked as an AT support specialist and I also served as the lead developer for the Student Accommodation Manager.

>> Johan Rempel: John has been a tremendous asset to CIDI. He wearing many hats. Some of you are familiar with who I am. I over see a lot of digital accessibility initiatives and UX initiatives at CIDI.

My background all my life has been in the area of disability. As a  
Rehabilitation Therapist,   
Orientation & Mobility   
Specialist, and Digital   
Accessibility Specialist.

And have overseen several other initiatives and the project manager for the AccessGA project. With that I will pass it on to John to kick it off.

>> John Toles: Today we will have an overview of language models and general view of people with disabilities and the benefits of AI for people with disabilities and the challenges of using AI for people with disabilities. And then how to remove barriers that are put in place and then a Q&A session at the end. So to start off we will do a very high level non‑technical over view of large language models. A large language model is what most people think of when they think of AI now because that's what chatGPT is. It's older than what most people think. AI has been a gold of computer science since the 1950s. It has been in the realm of science fiction until recently. It has been a goal since the inception. Early on it was defined as machine learning. The goal was to create a computer that can learn from experience.  
Early advancements in AI   
included:  
Programs designed to play games   
like checkers or chess.

Early applications was in the area of getting them to play chess. Chess was too complicated. So a lot of workers switched to checkers and had success there.

And then decision  
making programs that used   
probability to reach conclusions   
However, none of these were able to be more successful or able to outperform humans at the tasks. Next slide. So I want to define some terms. There's a lot of words or terms that get thrown around about AI and a lot of people may be confused about what they mean in relations to AI.

So algorithm is  
a set of instructions intended   
to yield a specific output from

Model. So think of it as the computer program that will eventually create the AI. An artificial neural  
Network (ANN, Neural Network, or   
NN) – computer system built to   
mimic the neurons of a human brain.

So a specific way of creating a computer system so it will work the way ‑‑ at least on an abstract method the way a human brain works.

Model ‑‑ that is the part of a  
neural network humans interact with. So when you talk to chat GPT you are not talking to the algorithm. You are talking to the model. That's after the training data gets put through the algorithm that creates the model and then you talk to the model when you ask questions and getting it to do things.

A large language model is a  
– a neural network trained to   
predict likely text outputs from   
human language inputs generative.

That's chat GPT. So when you interact with chat GPT, it's only predicting what you ‑‑ you ask it something and it use its prediction model to give you an output based on what you input.

Generative pre‑trained trance former is the GPT in chatGPT. That has been trained using a large amount of text.  
intended to generate outputs   
that resemble human writing. Small scales were not able to mimic human models. You may here the term  
Reinforced Learning from Human

Feedback. That's how they are trained. Humans analyze the output and determine whether it was good or bad and feed that back into the model to improve future iterations.

Next slide.

Recent advancements is they greatly expanded  
between 2012 and 2017 when new   
techniques began to create   
systems that approached human   
levels of competence.

So the original ones if you were interested in the stuff, the first you heard of was GPT 2.  
Between 2020 and 2022   
techniques, such as large   
language models and stable diffusion led to the successful generative AI. So the first really good output that mimic what a human could create.

Think dolly or one of the image creating AI systems.

The period following 2020 expanded funding research for generative AI has   
been called an “AI Boom”, when   
these systems began to create   
things that closely resemble   
works created by humans.

We're in that boom now.

Next slide.

So the parts of large language model. You can think of it as a cyclical system. It doesn't have to be but that's a good model for understanding how these work. You have the training data. That's information  
categorized by human beings so   
it is useable by the algorithm.

So like you can't just take everything from the Internet and feed it into it. You have to break it down into categories that the algorithm can use and make sense of.

Then the algorithm itself is the set of instructions created by human beings that the   
neural network used to interpret

Training data. And then you have the model which is the result  
of running the training data   
through the algorithm. This is   
the part of the system people interact with. When you talk to chatGPT, you are talking to the model.

So successes and failures.

Successes:  
Create large amounts of text

Quickly. You can ask chatGPT to write you a paper and it will do it in a couple of seconds. The writing resembles human writing. If you work at it, you can pretty much tell something created by an AI but it's closer and getting better.

And then the big advancement is it can interpret conversational language. You don't have to tailor what you say to chatGPT or any of these other systems you can talk to it the way you would talk to a human being and it will generally interpret what you are saying. Not completely successful but more than in the past.

And the failures: It inherits human biases from

Training data. If you feed bias responses it will have bias out.

The bad racial biases. If you only feed it data only about elephants, it will only talk about elephants. It can also have hallucinations. There's an example of you may have read stories about a sports writer trying to use chatGPT to create summaries of sports data from charts and historical charts and stuff like that. All of a sudden half way through writing the article it starts talking about unicorns and he can't get it to stop talking about unicorns. There's also problems with  
Sycophancy: Lies to create   
outputs which match user’s biases. If you express an opinion, they will try to reinforce the biases. It sets up to want a good response from a human to its output. So it will tailor to match humans. So if you express a bias or preference, it will try to reinforce that bias or preference. I'm going to turn it over to Johan. He will talk about defining people with disabilities.

>> Johan Rempel: Thank you, John. John and I had several conversations about witling this down. We could talk for hours about any one of these specific topics that we're covering. This is a high level over view. John did a good job of summarizing some very complex concepts and technologies.

So, because this is a work we are in and because individuals with disabilities are a priority we're going to define what that means when we talk about people with disabilities. There's often a lot of assumptions and false assumptions when we talk about who are people with disabilities. What are we referring to?

So this is a statistic that some of you may have heard in the past. There's more than 1 in 4 adults according to the center for disease control ‑‑ 27% in the United States are living with a disability. This isn't an insignificant percentage. This is a wide swath of individuals that are impacted by AI in a positive way and then in also a way that creates additional barriers. These are some terms or descriptions that the CDC uses.  
mobility: Serious difficulty   
walking or climbing stairs   
cognition: Serious difficulty   
concentrating, remembering, or   
making decisions lack of   
independent living: Difficulty   
doing errands alone deaf or have   
serious difficulty hearing   
vision: Disability with   
blindness or serious difficulty   
seeing even when wearing   
glasses.

And then lack of self‑care: Difficulty   
dressing or bathing independently. I prefer the World Wide Web  
Consortium’s Overview of

Disability.

It's more comprehensive. When we talk about physical that could involve walk or ascend or descend stairs but it could also include someone with limited or lack of fine motor skills. Maybe an individual has an amputation that would prevent them from using the traditional keyboard or mouse that we're familiar with.

It could involve physical fatigue as well. So a lot of categories fall into that. Cognitive, learning and neurological. This is in broad terms the most impactful, largest population. This could involve things like ADHD, dyslexia, brain injuries or neurological disabilities. So very broad perspective and probably the largest population that some of our units at CIDI serve.

And then visual, a lot of people think of disabilities immediately as someone who is blind who using a white cane and that certainly is an important population. Especially since the bar to make technologies accessible for someone who is blind is higher sometimes than other populations. But visual can also be someone with low vision, someone with color blindness. Auditory, this would be someone who is deaf or hard of hearing. And then speech. Maybe an individual who has some difficulties articulating specific words. This can also fall into someone who uses English as a second language. That could definitely impact their ability to use some technologies. So, it's important to realize that at some point in our lives if we live long enough, 100% of us will have ‑‑ experience a disability. At least one disability in our lives. Whether that's situational, temporary or permanent.

Situational could be using a phone on a bright day and those colors being drown out by bright light. Temporary could be maybe a broken arm that's healing a broken hand. And permanent is a disability that is not going to be going away through procedure or any other medical intervention of any kind.

So this is a wide spectrum. It does impact all of us at some point in our lives. Creating accessible and inclusive products and services benefits everyone. It's common for designers and developers meeting the needs of a particular population that also really benefits everyone. And not  
services benefits everyone Not   
considering the needs of people   
with disabilities in products   
and services disenfranchises up to a quarter of the population here and now.

So this is an important topic here that impacts the bottom line for companies and also for doing the right thing. It's significant from both perspectives. So the benefits of AI for people with disabilities. This is really life changing in so many ways for individuals with disabilities. Products and services that incorporate AI. We may not think of  
Autocomplete, spam filters,   
personalized streaming recommends as AI but that incorporates AI.

And then driving directions. I will share an incident that was shared with me several years ago. I received trainings through the Helen Keller Center in Long Island New York and an individual who is deaf/blind ‑‑ no hearing or sight shared with us how the technology that he used for directions in a taxi cab getting him from point A and B allowed him to redirect the taxi driver who didn't know the directions as well as this individual did with his refreshable braille display with his ability to navigate maps and for that to refresh and find the quickest route.

So this really has been a game changer for individuals with disabilities.

AI powered by Siri and Alexa. Google now.

Another example is our Tools for Life team sharing that the Alexa devices have allowed people in nursing homes to actually live an independent life and move outside of the nursing home. You can control your lights, thermostat, blinds, opening and closing doors. So that speech to text and text‑to‑speech technology runs on AI. Even though the buzz today with AI has to a large part surpassed that and is not talked about as much as it probably should. Google's  
Parrotron app allows individuals   
with speech impairments to   
translate speech patterns into   
fluent conversations.

And this is just a smattering. There's thousands of different apps and technologies that our Tools for Life team uses and recommends.  
Google's Live Transcribe app   
uses AI to transcribe speech in

Realtime for the deaf or hard of hearing population. And then likely most of you are aware of the AI captions that are available within MS teams, otter and Zoom.

Microsoft seeing AI for people with vision loss. This is a very impressive app. I used this recently and not only ‑‑ so, this is about a month and a half ago I used this app in a situation where I was with a married couple and what was carry to me was that the seeing AI app indicated that not only was it a woman in front of me but gave me her exact age. When it did that our jaws dropped. I don't know if it listens to a person's conversation after its open and it incorporates some of that into its guessing but it got the exact age of the woman across from me which was spooky.

Wheel map using AI to  
crowdsource accessibility   
information about public spaces.

So someone who uses a wheelchair can plan routes in advance. So all of these can be game changers for individuals with disabilities.

And this reflects the buzz around AI. This is a recent announcement by  
Microsoft AI Copilot Key:

Some of you may have heard of this modified keyboard that's recently introduced that works with Windows 11. For decades we have had the same QWERTY keyboard. This is the first time in many, many years that keyboard will be changing. They will provide the option for the old keyboard but as it stands now this is something that Microsoft is pushing. You are seeing big tech really rushing toward AI to monopolize the market. It's powered by tech from chat GPT.

To the right is an image of the actual copilot key.

The challenge is it's going to be replacing ‑‑ on some keys it will replace the right hand control key or the menu key. So Microsoft may have just introduced some barriers because for individuals with limited stretch capability with their hand just having one control key could be problematic or for individuals who are not able to use a traditional mouse and rely heavily on shortcut keys that right hand control key or men sue the absence of those will incorporate accessibility challenges at the cost of Microsoft pushing their AI technology.

Challenges of AI for people with disabilities. One challenge is AI generated alt text. Alt text benefits individuals who are blind for instance who aren't able to see an image. So they need that image described. And here's an example of some AI generated alt text that can be comical but not so comical for people who rely on this for school or employment situations.

So the first alt text is may be an image of 5 people, people standing and outdoors. The actual image is a helicopter with President Biden descending the stairs and the military representation saluting him with the pilot still in the helicopter. To the left of the president is the White House seal.

Another alt text that was generated was a group of people standing next to a train. We clearly know this isn't a train, right? That's the challenge with AI. Once it gets it wrong, it tends to really get really wrong.

And the last is the group of men standing next to a helicopter. That's not inaccurate but there's so much to this. This isn't a typical group of men. So this is one example of how AI generated alt text can do more damage than good.

Some of you may be aware of this and may have used this in the past. So Microsoft for a couple of years now has provided AI alt text for images. Whether for PowerPoint or in Word. Depending on the version it may be set to default. This is problematic because if it's set to default, then what it's doing is just erroneously applying alt text that may or may not be accurate and then when a person runs an accessibility checker that image has an alt text and it's checked as okay that the accessibility checker is not going to flag that because there was alt text applied to it.

It's another question entirely whether the alt text was accurate or not. So Microsoft, although they had good intentions here may be doing more damage than good by making that a default.

And then apps like LinkedIn Facebook and Instagram use generated alt text.

I will give an example that I had earlier this week that was problematic. Alt text is crucial. This is one example. We have a picture of tulips to the right. Bright yellow tulips. This is where AI can fall short. Developing the context that we as humans take for granted. If this was an image on a website the alt text could read yellow tulips blooming in the Spring.

If this was a student taking a horticulture class and their grades were dependent on interpreting this correctly then that first alt text would not be appropriate. So more specifically this is a tulipa gesneriana. So a very specific type of tulip. If this represents a link that represents an organization it might be tulip society of America. And if this is a decorative image that doesn't add anything to the experience, you may want to add an alt attribute where a screen reader would not detect this image.

So there are times when an image should not be labeled so it doesn't cause auditory overload for individuals who are blind. So you can see with this single image context is crucial. With our captioning department they focus on a lot of text books. They will pull in subject matter experts. For example, an astronomy image or in biology image. There's research that needs to be done to interpret that image successfully so we're not providing ‑‑ so we're not creating barriers for students who are dependent on accurate descriptions in order to succeed in their academic endeavors.

So captions. You are all likely familiar with captions. We have Heather live captioning this today. AI generated captions is something that YouTube uses a great deal. There are benefits to AI captions. They can produce content quickly.  
thereby producing large volumes   
of product descriptions, news   
stories, or other types of   
content that require little personalization.

There are significant barriers. One is confidence intervals. AI assumes that the next word if misspoken or when sound  
interference occurs, which is   
then included in the transcript   
as if it was actually spoken.

That can be wildly inaccurate.  
AI will not include a   
parenthetical as in (cannot   
hear), (inarticulate), in the

So an individual can by process of elimination inquire about that section that was inaudible due to a bad microphone that they can fill in gaps themselves verses having AI make assumptions on what that inaudible content was.

And the phrase if unable to understand the words removing the opportunity to ask for further clarification like I mentioned. And then human inarticulation like you know, like, so, apparently. For court settings that's appropriate but for every day interactions, for training, for education those are fillers that provide additional words that someone needs to go through in order to get to the meat of the substance. So how and when to use AI generated captions? There's an image here of a video that's been paused with two gentlemen in holiday attire with their mouths open singing. The caption here ‑‑ this is one of many examples of humorous captions that have been misinterpreted by AI ‑‑ read off the rent those reindeer. We know it's Rudolph the red nose reindeer. It's the context. It's the holiday attire and singing Christmas carols. That takes us little time and effort to ascertain that. So that's an example of where AI can fall short. Once AI gets things wrong, it typically gets things very, very wrong. AI captions are best for low stakes multimedia and meetings without critical information. Teams and otter AI provide fairly good speech to text translation and in a casual meeting when the stakes are low that's a nonissue. But when you are looking at someone's healthcare related information or education or employment, that's where close to accurate is really not an option. It needs to be accurate. Otherwise we're really putting people with disabilities at a disadvantage and providing misinformation. The trained AI models exhibit learned disability bias. This was a fascinating article from Pen State College. So, this highlights how AI can have bias itself. It's a detailed research paper. I have left the link at the bottom for you all to follow up on if you want to get into more detail. It shows explicit bias detected against people with disabilities. This came out late last year. AI tools often contain byssus against people with disabilities. Statements referring to people with disabilities receive more negative and toxic scores than from other control categories. Tools often classified statements as negative or toxic simply by the presence of terms such as blind. As John mentioned when you have junk data coming in, you will have junk data coming out.

So the AI is only as good as the information being fed. So if there's biases in our society, we can't rely on AI to clean that up and fix biases. And this is an article from posted on ADA.gov. AI can create discrimination in hiring. This is a warning given on some of the flaws of AI. ADA.gov explains how some algorithms can lead to disability discrimination for hiring. Keep in mind, the Americans with Disabilities Act is all about reasonable accommodations and lack of discrimination. So, related to AI,  
job advertisements to targeted   
groups deciding if an applicant   
meets job qualifications holding   
online video interviews of   
applicants using computer‑based   
tests to measure an applicant’s   
skills or abilities scoring applicants resumes.

This isn't to suggest that all AI is discriminatory. What the Department of Justice is doing is warning organizations that it can lead to that. So removing barriers to help ensure inclusion of people with disabilities.

So, really it's crucial to make sure that people with disabilities have a seat at the table. It's critical that people who are designing the human computer interactions improve their knowledge of inclusive  
human‑centric design principles   
that take persons with   
disabilities into account.   
Disability is highly nuanced and   
diverse and user research should   
be conducted with that in mind.

What's profitable for big tech is scalability. So if they can scale AI and it can be applied to everyone or everyone can leverage it, that's very profitable. But what sometimes is less profitable is slowing down and taking into account various individuals and their preferences. With whether they have a disability or just different needs and preferences themselves.  
By working alongside and   
collecting feedback from   
individuals with various types   
of disabilities and who are   
neurodivergent, there is greater   
assurance of a more optimal,   
inclusive, and accessible   
experiences for everyone.

So, not all of us work in big tech. So we don't necessarily have the levers available, the impact. But one thing we can do is we become aware that AI is being problematic we can reach out to that particular company and let them know that. And the procurement process is crucial. It's a  
responsibility of organizations   
to effectively vet AI‑related   
products in their procurement   
process to ensure more equitable   
experiences and opportunities   
for everyone.

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So we all aren't AI experts but what we can do is do our due diligence to vet products or services before purchasing or recommending them.

And then this last slide here we have some resources that can be of benefit to many of you. I encourage you to share this. This entire PowerPoint is going to be made available and e‑mailed to all registrants as an accessible PDF. This presentation is being recorded and that will be sent out to you all and the full transcript of this presentation.

So AI for disability inclusion. This is a fantastic resource created by Accenture. It talks about making sure people with disabilities are at the for front of leveraging AI. Automated ableism research paper. And the algorithms, artificial intelligence and disability discrimination in hiring on the ADA.gov website. And here are apps that are significant for people with disabilities. The Google Parrotron app, the Microsoft seeing AI app and the wheel map app. And with that we will go ahead and field some questions here.

Let's just take a look at the chat here.

John, if you want to jump in if you see any questions or comments in the chat that you want to address, feel free as I sift through these.

>> John Toles: We had one question come in about the AI copilot key. They want to know what will that key on the keyboard actually do?

>> Johan Rempel: My understanding is it will launch into AI services such as chat GPT. So it's a very quick and easy way to access what we today think of as AI. But my guess is that it will change as the technology changes. So that's the best I can describe with what it sounds like that AI key is going to be doing. Again, it's like any other key. You can assign it for a specific task. So as AI evolves, my guess is that that will evolve as well.

>> John Toles: Watching the consumer electronics show in Las Vegas is where I first saw the copilot key. I saw a few different implementations of it. The most common is it will launch the Microsoft edge browser to the Bing search site. So if you use Bing you may notice while you have your cursor in the input box if you scroll down it will switch over to copilot mode where anything that you put in the text input will go through copilot rather than just doing a web search. A lot of them I also saw where they didn't do anything yet because it was a lap top that was just a dummy model or isn't fully implemented yet. Like Johan said, it will probably change a few times over in the course of figuring out what they want it to do and what will work best for people.

>> Johan Rempel: Excellent. Thank you, John. Any additional questions? Feel free to drop in the Q&A.

>> John Toles: We had a few people ask about the slides. We will send the slides out after the presentation, along with the recording and the slides will have the links and everything on them.

>> Johan Rempel: We will give folks a little more time to ‑‑ for the opportunity to ask additional questions.

John, I'm not seeing any questions coming through. Unless I'm missing them.

>> John Toles: I'm not seeing additional questions coming in through the Q&A.

>> Johan Rempel: All right. Hopefully, this presentation was helpful. We really wanted to tie in the ‑‑ there's so much buzz around AI and we wanted to tie in how it is a game changer for people with disabilities but it's our responsibility to be cognizant about the barriers and do our best to remove the barriers for people with disabilities. So, AI doesn't become a stumbling block for people with disabilities and their right to independence like the rest of us.

All right. Well if there are no other questions we will close out. I know your time is valuable. We thank you all for taking the time to attend. We appreciate it. You will be receiving the PowerPoint as an accessible PDF, the transcript and the MP4 video of this entire session in the coming days. Thank you all and unless John you have any other closing comments we will shut it out here.

>> John Toles: I'm seeing a lot of "thank yous". Somebody did ask do you have any current learnings on generative AI and accessibility and disability. So I think the articles that we linked to in the slides at the end ‑‑ the resources ‑‑ that would be a good place to start with that question. Do you have any suggestions on that Johan?

>> Johan Rempel: So I would refer to those resources as well. That article ‑‑ that resource from Accenture would be helpful as well. They seem to have put a lot of time and energy in that article. They are very inclusive for people with disabilities. I would point you back to that article on that list of resources as well.

Thank you. I see Elizabeth posted that. Excellent.

All right. Well, once again thank you for taking time out to sit in on this webinar. Hopefully, it was helpful. We will be reaching back to you in the coming days with all the archives that I mentioned. With that we will close out. Thank you to our ASL interpreter and our captionist. Enjoy the rest of your day.