# Canadian and International Experts Weigh In: An Annotated List of AI-Related Resources for College and University Students with and Without Disabilities

## Adaptech Research Network, Montreal, Canada

## <http://www.adaptech.org>

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On May 1, 2020 the Adaptech Research Network held two Artificial Intelligence Advisory Board meetings via Zoom. Participants from Canada, Germany, Israel, the United Kingdom, and the USA shared AI-related apps and devices as well as projects and articles. The Adaptech team curated all of these and prepared an annotated list. The list is provided below under the headings “Apps and Devices” and “Projects and Other Resources.”

Artificial Intelligence Advisory Board participants were (in alphabetical order of first name)**:** Alex Lussier, Alice Havel, Anick Legault, Björn Fisseler, Catherine Fichten, Christian Généreux, Christine Vo, Dana Kaspi-Tsahor, David Benrimoh, Dorit Olenik-Shemesh, Eva Libman, Hadi Rangin, Isabel Korn, Jennison Asuncion, Jillian Budd, Jutta Treviranus, Laura King, Loubna Bennabou, Maegan Harvison, Markus Deimann, Mary Jorgensen, Natalie Martiniello, Rafael Scapin, Rajesh Malik, Ray Bourgeois, René Dallaire, Rhonda Amsel, Rick Schmid, Roch Ducharme, Rosie Arcuri, Sheryl Burgstahler, Sonia Israel, Sonja Washer, Susie Wileman, Tali Heiman, Tamara Vandersluis, Tim Coughlan, and Vince Maggiore.

## Apps and Devices

* AIDA (<https://www.mindtools.com/pages/article/AIDA.htm>) is an online resource to improve student writing.
* Aira (<https://aira.io/aira-about-us>), which stands for “Artificial Intelligence and Remote Assistance,” combines AI with a sighted assistant to help guide users with a visual impairment through a physical environment, or to describe the physical environment around them. Individuals or institutions can subscribe. When institutions subscribe anyone in that specific institution can use the service free.
* ALLY (<https://ally.ac>) can determine how accessible a document is and help professors improve the accessibility of their courses.
* Amazon Alexa ([https://apps.apple.com/app/id944011620 /](https://apps.apple.com/app/id944011620%20/) and <https://play.google.com/store/apps/details?id=com.amazon.dee.app>) is a virtual assistant AI for Amazon Echo devices and some Android devices. It uses voice commands in order to answer questions and perform actions based on the user’s requests.
* Antidote (<https://www.antidote.info/en>) is a linguistic revision tool that uses AI and is helpful for students with learning disabilities. It is available in English and French.
* assist-Mi (<https://www.assist-mi.com>) is an app that connects service providers and caregivers with the disabled who may be in need of immediate assistance.
  + Services can include help getting to work, shopping for groceries or other means of travel and assistance.
  + There is a feature within the app called Mi-Profile that provides the service provider or caregiver with the individual's needs and disability information so the service provider will know what to do when an individual requests assistance.
  + The app also allows for two-way communication and a uses a GPS feature for better, more accurate location information.
* Auticon (<https://auticon.ca/>) is a website that helps students with autism spectrum disorders find a job in the technology field.
* AXS Map (<https://www.axsmap.com/>) is a free AI-enabled application that helps individuals find ramps and wheelchair accessible bathrooms.
* BlindSquare (<https://www.blindsquare.com/about/>) is an AI-enabled GPS application for blind users, and those with visual impairments. It helps with outdoor navigation by providing information about intersections, and businesses that you walk past. Individuals can add additional information such as favorite places and filters, so the individual only gets the information they need.
* Brain In Hand (<https://braininhand.co.uk/>) is an AI-enabled application that helps individuals manage difficult situations, cope with anxiety, and provides reminders. Once the individual subscribes to this application, they gain access to a personal specialist setup, accessible self-management tools, and contact with a human support network. This is helpful for students with mental health disabilities.
* CamFind (<https://apps.apple.com/ca/app/camfind/id595857716>) is an AI-enabled application that helps with image recognition. The individual takes a picture of an object, the application then provides a description of the image.
* DeepL (<https://www.deepl.com/home>) is an AI-enabled translator that can translate entire PowerPoints without effecting the formatting of the PowerPoint. It is considered by many to be more accurate than Google translate.
* Dot Watch (<https://www.dotincorp.com>) is a wearable device that uses AI to translate text into braille.
* Dragon Naturally Speaking (<https://www.nuance.com/dragon.html>) is a speech recognition software that transcribes speech into words. Dragon Anywhere (<https://www.nuance.com/dragon/dragon-anywhere.html>) is the dictation and text-to-speech app for iOS and Android.
* Empower Me (<https://www.businesswire.com/news/home/20171107006113/en/Brain-Power-Releases-Augmented-Reality-Smartglasses-People>) is a digital coach that runs on Google Glass, to empower children and adults with autism to teach themselves social and cognitive skills toward happy self-sufficiency. Empower Me features a suite of applications such as Emotion Charades that teaches the user to identify emotions and understand them. Other features include applications to target attention to social cues, including the ability to focus on face and eye regions when it is desirable to do so.
* EMPRIZE (<https://xprize.org/prizes/artificial-intelligence/teams/emprize>) is a team of students, faculty, and staff associated with the Georgia Institute of Technology's Design & Intelligence Laboratory. The team developed four novel and intertwined AI technologies:
  + VERA, a virtual experimentation research assistant for supporting inquiry-based learning of scientific knowledge;
  + Jill Watson Q&A, a virtual teaching assistant for answering questions based on educational documents including VERA’s user reference guide;
  + Jill Watson SA, a virtual social agent that promotes online interactions, and
  + Agent Smith that helps generate a Jill Watson Q&A agent for new documents such as class syllabi.
* FlickType (<http://www.flicktype.com/>) is an AI-based adaptive on-screen keyboard. The individual can start typing where they believe the right keys are located, even if this is not the case, it does not matter, the application tries to predict what the word should be based on stored data of words used in the past.
* Google Assistant (<https://assistant.google.com/>) is a virtual assistant AI that can be used on smartphones and smart home devices. It uses voice commands in order to answer questions and perform actions based on the user’s requests.
* Google Home (<https://play.google.com/store/apps/details?id=com.google.android.apps.chromecast.app&hl=en_CA>) is a voice assistant AI that uses Amazon Alexa and AI-enabled features on the user’s smartphone or Google Home device.
* Google Maps (<https://maps.google.com/>) is a mapping service that provides imagery, photography, street maps, real-time traffic conditions, and route planning. It uses AI-based features to send specific reminders based on your location at a specific time and departure points.
* Google Slides (<https://blog.google/outreach-initiatives/accessibility/whats-you-say-present-captions-google-slides/>) provides real-time closed captions.
* Google Translate (<https://translate.google.com/>) is an AI-enabled translator that can translate short segments of text, or entire documents. The application detects the language that you are translating from automatically.
* IBM Watson Assistant (<https://www.ibm.com/ca-en/marketplace/watson-assistant>) enables you to create an application that understands natural-language and responds to customers in human-like conversation in multiple languages.
* If This Then That (IFTTT) (<https://ifttt.com/>) is the free way to get all your apps and devices talking to each other. One of the features of this AI-based application is that it uses your current location, as indicated by the Wi-Fi network in use, or where you last signed in, as a trigger to engage in an action, such as sending a message to someone.
* Just Press Record (<https://www.openplanetsoftware.com/just-press-record/>) is an AI-enabled mobile audio recorder that allows recording, transcription, and iCloud syncing to all ones devices with one tap.
* Microsoft Math (<https://math.microsoft.com/>) is an AI-based application that can solve complex math problems.
* Microsoft Seeing AI (<https://www.microsoft.com/en-us/ai/seeing-ai>) is an AI-enabled application that helps recognize objects in one’s physical environment and can read aloud what is written on documents and currency (text-to-speech functionality). This application can also describe the scene and people around an individual. The other features of this application include reading handwritten text, describing color, and helping to locate barcodes on products in stores.
* Microsoft Soundscape (<https://www.microsoft.com/en-us/research/product/soundscape/>) is a free GPS application that uses artificial intelligence to help people with visual impairments navigate physical environments. The application calls out landmarks in relation to an individual’s location and calls out roads and intersections. In addition, the information use buttons can be selected, such as ‘Locate’, ‘Around Me’, and “Ahead of Me’ to ask for points of interest in the environment.
* Microsoft Teams (<https://www.microsoft.com/en-ca/microsoft-365/microsoft-teams/group-chat-software>) is a communication and collaboration platform for workplace chat, video meetings, file storage, and application integration. It uses AI and can allow students to communicate and collaborate with their teacher.
* Microsoft Translator (<https://play.google.com/store/apps/details?id=com.microsoft.translator&hl=en_CA>) is an AI-enabled translation application that translates texts into over 60 languages. The application can translate the text within photos and screenshots. This application also facilitates a bilingual conversation by translating what an individual says into the language of choice.
* My Medic Watch (<https://www.mymedicwatch.com/>) can detect when a seizure occurs, send a notification, sends a GPS location to chosen individuals best suited to help, and sends updates of your recovery progress to chosen individuals.
* Nearby Explorer Online (<https://play.google.com/store/apps/details?id=org.aph.nearbyonline>) is a free GPS application for students who are blind that helps them navigate their physical environment.
  + This can help students who are blind locate places on campus.
  + You can even mark a specific location to get more detailed information.
* Office Lens (<https://www.microsoft.com/en-ca/p/office-lens/9wzdncrfj3t8?activetab=pivot:overviewtab>) is an AI-enabled application that makes pictures of whiteboards and documents readable. The application allows for the conversion of images to PDF, Word, and PowerPoint files, in which a text-to-speech feature is available. The program allows an individual to save the converted images to OneNote, or OneDrive.
* OrCam MyEye 2 (<https://www.orcam.com/en/myeye2/>) is a wearable device that is blue tooth and AI-enabled – completely offline - that takes a picture of an individual’s surroundings and transmits the information audibly enabling real-time communication while ensuring data security. The device instantly converts any type of text, people’s faces, products, and other visuals into audio for transmission through a tiny speaker that rests above the wearer’s ear.
* Otter (<https://otter.ai/login>) is an AI-enabled technology that helps with note taking by providing automatic live transcription of lectures. The application can also provide a live transcription of conversations in class during group work.
* QTrobot (<http://luxai.com/qtrobot-for-autism/>) is an expressive and engaging robot designed to increase the efficiency of education by encouraging an active and engaged interaction and making it simple to attract children’s attention to teach new life skills.
* Quizlet (<https://quizlet.com/>) is an AI-enabled application that helps students learn using flashcards across diverse disciplines.
* SeizAlarm (<http://seizalarm.com>) is an iPhone and Apple Watch application that automatically alerts emergency contacts when an individual experiences seizure like motions and provides their location. The individual can also manually alert emergency contacts if they feel they will need help soon.
* SensusAccess (<https://sensusaccess.com>) can automatically convert documents into a range of alternate media including audio books, e-books, and digital braille. The user can convert inaccessible documents into accessible formats.
* Siri (<https://www.apple.com/ca/siri/>) is a virtual assistance AI that is part of the iOS branch of operating systems. It uses voice commands in order to answer questions and perform actions based on the user’s requests.
* SmartWatch Inspyre (<https://smart-monitor.com/about-smartwatch-inspyre-by-smart-monitor/>) detects repetitive shaking motion and signals the user’s device to send a text and phone call alert to whomever the user designates as an emergency contact. The alerts include the date, time, location, and duration of the seizure. The watch even stores information about the seizure that physicians can later access and review.
* Sonic Hearing Aids (<https://www.sonici.com/hearing-solutions/hearing-aids>), which is Bluetooth enabled and uses artificial intelligence, helps the individual understand what the students are saying and helps them communicate with their students. It also works well with smartphones.
* SwiftKey (<http://www.microsoft.com/en-us/swiftkey?rtc=1&activetab=pivot_1%3Aprimaryr2>) is an AI-enabled keyboard application that learns and adapts to match the user’s unique way of typing.
* Uber (<https://www.uber.com/>) and its similar applications use AI-enabled algorithms to remember where you would most likely want to go, and your favorite restaurants based on your current location.
* UNI (<https://www.indiegogo.com/projects/motionsavvy-uni-1st-sign-language-to-voice-system#/> ) is an AI-enabled device that converts sign language to speech in the designated language. UNI also converts speech to sign language. In addition, it enables people to create their own sign language with the built-in sign builder.
* Voice Dream Scanner (<https://apps.apple.com/ca/app/voice-dream-scanner/id1446737725>) is one of the best optical character recognition (OCR) applications available; it even works well in dark places and in poor lighting. The application has built in text-to-speech functionality.
* Voiceitt (<http://www.voiceitt.com/>) is an AI-enabled application that understands ‘non-standard speech’ resulting from acquired, or congenital conditions (formerly called TalkKit).
* Widex Evoke (<https://www.widex.ca/en-ca/hearing-aids/evoke-smart-hearing-aids>) are smart hearing aids that learn from an individual’s hearing experiences. The hearing aids adapt to the environment and can distinguish between different social environments such as meetings and parties. These hearing aids allow the individual to filter out background noise that can distract from understanding what someone is saying in a noisy environment. However, the individual can also focus on subtle auditory details in quiet environments.
* Woebot (<https://woebot.io>) is an AI-enabled application that helps provide cognitive behavioral therapy to help students cope with stress and personal problems.
* Zoom (<https://zoom.us/>) is a video and chat conference service.

## Projects and Other Resources

* A list of resources and projects about the use of artificial intelligence and mobile technologies in education (<https://library.educause.edu/search#?publicationandcollection_search=EDUCAUSE%20Center%20for%20Analysis%20and%20Research%20(ECAR)>)
* A study about how students use online tools to facilitate their academic success (<https://library.educause.edu/resources/2019/10/2019-study-of-undergraduate-students-and-information-technology>)
* A study that examines technological investments institutions will spend the most time implementing, planning, and tracking in 2020, as well as the related trends that could influence institutional IT strategy (<https://library.educause.edu/resources/2020/1/higher-educations-2020-trend-watch-and-top-10-strategic-technologies>)
* The website of a community-driven project (<https://wecount.inclusivedesign.ca/>) to address the inherent bias against small minorities and outliers in artificial intelligence and data analytics. Disability often places you at the margins of a data set. We Count addresses this bias by making sure people with disabilities can participate in shaping data science, addressing data gaps and biases, co-designing protections against data abuse and misuse, and co-creating more equitable decision supports.
* An article (<https://dl.acm.org/doi/abs/10.1145/3362077.3362086>) that examines how artificial intelligence can perpetuate the discrimination of individuals with disabilities. The article, also, discusses strategies for supporting fairness in the context of disability throughout the AI development lifecycle. The article suggests that people with disabilities should be included when sourcing data to build models, and in testing, to create a more inclusive and robust system.
* An article (<https://medium.com/datadriveninvestor/sidewalk-toronto-and-why-smarter-is-not-better-b233058d01c8>) addressing concerns about what smart systems do with people that deviate from the norm or average. Sometimes inputting many data about average behavior can lead smart systems to react erroneously to behaviour that deviates from the norm. The article, also, addresses the issue about the failure of privacy policies to protect the identity of individuals with disabilities.
* An article (<https://www.technologyreview.com/2019/08/02/131198/china-squirrel-has-started-a-grand-experiment-in-ai-education-it-could-reshape-how-the/>) about the use of smart tutors in China. The article addresses the limitations of smart tutors, which require the intervention of teachers to answer questions. There are also, privacy concerns regarding the mass amounts of data that inform the smart tutoring systems, which may be tenuous in western countries.
* A report of Sidewalk Labs Digital Innovation Appendix (<https://quaysideto.ca/wp-content/uploads/2020/02/DSAP-Supplemental-Report-on-Sidewalk-Labs-Digital-Innovation-Appendix-DIA-Appendices-FINAL.pdf>).
* A talk (<https://www.youtube.com/watch?v=OAXmCAqZqRk>) that address concerns about what smart systems do with people that deviate from the norm or average.
* An article (<https://medium.com/@jutta.trevira/its-time-to-drop-darwinism-and-listen-to-darwin-and-his-successors-on-human-evolution-19239068e8dc>) about the need to include people with different struggles in the design world. Rather than sacrificing the fragile, as suggested by Darwinism, it is important to respect and include people who are ‘fragile’ to create a kinder, and more generous world.
* An article (<https://www.cnbc.com/2018/12/14/ai-bias-how-to-fight-prejudice-in-artificial-intelligence.html>) about how human biases can filter into AI systems and algorithms. However, having access to large diverse data sets helps to train algorithms to maintain the principle of fairness.
* The website for the ADMINS project (<https://iet.open.ac.uk/projects/admins>) that will create a chatbot assistant that can enable more efficient and effective access to support for people with disabilities around the world.
* An interview with Jennison (<https://the1a.org/segments/designing-our-world-accessibility-in-tech/>) about the accessibility, and usability of smart technologies for individuals with disabilities.
* An article (<https://www.ibm.com/blogs/watson/2017/08/bolton-college-uses-ibm-watson-ai-to-build-virtual-assistant-that-enhances-teaching-learning-and-assessment/>) about how Bolton College used IBM Watson to build a virtual assistant ‘ADA’ that enhances teaching, learning, and information access. The virtual assistant can respond to questions across multiple domains.
* A link to Vincent’s LinkedIn profile (<https://www.linkedin.com/in/vincent-maggiore-499a60197/?originalSubdomain=ca>) where he describes his IBM Watson AI Virtual Assistant called "IAMI"
* A resource from DO-IT (<https://www.washington.edu/doit/accessible-cyberlearning-community-report>) in which it is recommended that instructors use inclusive digital tools in their courses, that researchers address accessibility issues in all stages of their work, and that funding agencies require their funded cyberlearning projects to do the same.
* An article (<https://datafloq.com/read/how-wearable-technology-help-people-disabilities/3254>) about how AI-enabled wearables can help people with disabilities. It names and describes five wearables that can be helpful.