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## ARB Project Presses On During the Pandemic

With the COVID-19 pandemic sending our communities inside for over a year, the R<sub>2</sub>D<sub>2</sub> center had to adapt and transition into online work. Our team worked hard to keep up the pace of all our projects despite the obstacles and challenges that accompanied collaborating online. Our progress with the AccessRatings for Buildings project is evidence of that effort.

[AccessRatings for Buildings \(ARB\)](#) is a [NIDILRR](#) funded project that is developing mobile and web-based software that provides up-to-date accessibility information about public buildings for people with disabilities. ARB consists of two sub-projects: AccessPlace and AccessTools. The AccessPlace app creates and reports public accessibility data from consumers as they review the accessibility of community buildings. Unique AccessPlace filters enable individuals with disabilities to post and find ratings personalized to their needs. AccessPlace allows the user to create their own 'Ability Profile,' which links the needs of an individual to ratings provided by people similar to them and their individualized accessibility needs.

The AccessTools application is a detailed building accessibility rating system that allows trained raters to thoroughly assess buildings. AccessTools answers comprehensive questions about the accessibility of various building aspects, including the main entrance, indoor routes, bathrooms and more. Both AccessPlace and AccessTools are currently being tested and prepared for public use.

During last summer, on June 26th, we celebrated the 30th anniversary of the Americans with Disabilities Act, which outlawed discrimination based on disability. In celebration of this important achievement for individuals with disabilities, our R<sub>2</sub>D<sub>2</sub> Center released the first edition of the stand-alone ARB MiniTools apps that use mobile device sensors ([AccessSound](#), [AccessSlope](#), and [AccessRuler](#)) in the Apple App Store. These apps measure specific accessibility features of public buildings including noise level, ramp inclines, and distance measures such as reach heights, turning spaces, and door widths.



The MiniTool apps are also integrated into the AccessTools app, meaning they are available for trained raters to assess building accessibility. The future of MiniTools continues to evolve with development of the AccessLight app. AccessLight will evaluate the lighting of a space by assessing task, ambient, and accent levels to determine accessibility on a scale from sufficient to poor.

To download the MiniTools apps, purchase from the Apple App Store is \$0.99 each.

For more information about the ARB project go to [uwm.edu/r2d2/projects/arb](http://uwm.edu/r2d2/projects/arb)

## HESTIA NextGen Wants Your Feedback

The [HESTIA](#) project, in collaboration with [Texas Woman's University](#), [Columbia University](#), [Marquette University](#) and [Independence First](#), began in 2014 as a multi-faceted assessment designed to identify problems in the home environment that could be impede a person's ability to successfully live independently. In 2020, HESTIA stepped up to the next level in a new funding phase with a NextGen focus.

HESTIA-NextGen was awarded NIDILRR DRPP funding to build reports into its home evaluation app. The initial development focused on the data collection component of this system. HESTIA-NextGen focuses on the development of two apps, myHESTIA and HESTIApro. These collect data and create reports for consumers and professional stakeholders, respectively.

MyHESTIA is targeted at individuals with disabilities while HESTIApro is designed to be used by health professionals in discharge or home intervention planning.

MyHESTIA is a resource for individuals to live independently. The app provides home



modification solutions to allow for increased ability to engage in desired occupations for the elderly population. The report provided from myHESTIA will identify current risks in the home environment and guide the user via home interventions tailored to their specific needs.

HESTIApro is an intervention planning tool that provides options for improvement via the home environment's problem list. This app generates alternative interventions for occupational therapists or other rehabilitation professionals.

HESTIA is funded by [NIDILRR](#), the National Institute on Disability, Independent Living, and Rehabilitation Research in the US Department of HHS/ACL.

For more information regarding the HESTIA project go to: [uwm.edu/r2d2/projects/hestia](https://uwm.edu/r2d2/projects/hestia)

## Our New R<sub>2</sub>D<sub>2</sub> Website Launches

After a year of development, we're excited to launch our new website that showcases past work, new achievements, and R<sub>2</sub>D<sub>2</sub> tidbits.

The website was developed around accessibility. For example, all graphics and photographs included on the website link to [Equivalent Text Descriptions \(EqTDs\)](#). EqTDs are text descriptions that increase accessibility for those with visual limitations and impairments in a universal format.

Check out [our News](#) feature to keep informed on the latest happenings and notable accomplishments that our staff is proud to share.

To learn more about [our team](#), [research methods](#), [main projects](#), [publications](#), [presentations](#), [conference appearances](#), and how to [get involved](#) please go to [uwm.edu/r2d2](https://uwm.edu/r2d2)



## The Future of Brain-Computer Interface

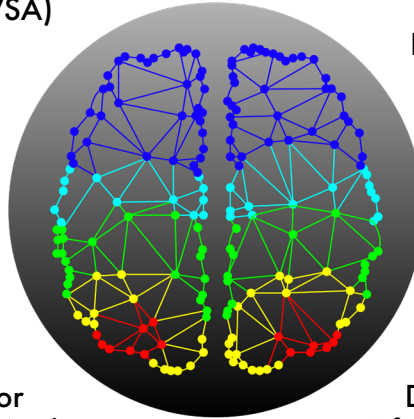
Brain-Computer Interface research at R2D2 began with a collaboration with UW-Madison on stroke rehabilitation. The experience from this collaboration, as well as previous research on the effect of multifocal lenses on visual perception, sparked the idea for our Covert Visuospatial Attention (CVSA) direction classification project.

This project aimed to identify the direction to which an individual is covertly attending, without overtly moving their eyes, head, or neck.

The implications of this project are extraordinary. Most notably, individuals with severe loss in motor function (e.g. in the final stages of ALS) will benefit from this project as it increases their capability to communicate with their loved ones and control their environments.

Research shows this lack of communication or

control is the main reason these individuals refuse prolonging their lives on life-support once in critical stages. In a pilot study, the research team achieved more than 70% accuracy in direction classification, solely from the occipital lobe electrical activity.



Due to competing priorities in the R2D2 Center this project is on hold and with a willingness to transfer to a collaborative research institution.

Targeting ultimate success for this project, our project lead Maysam Ardehali often credits a famous quote by Einstein seen in Dr. Smith's office at R2D2 Center: "If we knew what we were doing, it wouldn't be called research."

Learn more at: [uwm.edu/r2d2/projects/bci-eeeg-cvsa](http://uwm.edu/r2d2/projects/bci-eeeg-cvsa)

## New Textbook Unveils Soon

The director of the R<sub>2</sub>D<sub>2</sub> Center, Dr. Smith has been working with Dr. Mihailidis from the University of Toronto on their new textbook titled "Rehabilitation Engineering: Principles and Practice". Stay in touch for its release!



## Look for Future Updates

Thank you for reading the first R<sub>2</sub>D<sub>2</sub> Update! Stay tuned as we plan to periodically send out a newsletter filled with stories on our projects at R<sub>2</sub>D<sub>2</sub>, including [AccessRatings for Buildings \(ARB\)](#), [MED-AUDIT](#), and [more](#).

We encourage you to pass this newsletter along to fellow researchers, R<sub>2</sub>D<sub>2</sub> friends and alumni, or anyone else who might be interested in our developments. Watch for our next newsletter with upcoming community engagement events, presentations, and our newest publications.

For more information about any of these projects and more ways to get involved please contact our staff at [r2d2@uwm.edu](mailto:r2d2@uwm.edu).