Re:Wireless - The Wireless RERC's Consumer Newsletter
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Volume 9, Issue #03

Connecting consumers of all ages and abilities to the research, development and outreach activities of the Wireless RERC.

Welcome!

This issue of *Re:Wireless* highlights several exciting research and development projects we have underway, and also provides an update to some recent Wireless RERC FCC filings on wireless emerency alerting and accessible wireless communications. Here's what we're featuring:

- Wireless RERC researcher, John Bricout, is leading a collaborative multi-university research project between UMN and UTA on how caregivers and care recipients interact with a robot named Pepper.
- Wireless RERC researcher, Maribeth Gandy Coleman, and her team are developing smart clothing for people with visual impairments.
- **We are seeking feedback from the public!** We would like the public to weigh in on some of the key takeawys from our recent Leadership Workshop. Most notably, how do we engage stakeholders so they can participate in federal rulemakings? Details on getting involved are featured below.
- We feature two of our recent filings of comments to the FCC on:
    - Multimedia Content in Wireless Emergency Alert Messages, and,
    - The Accessibility of Communications Technologies for the 2018 Biennial Report Required by the Twenty-First Century Communications and Video Accessibility Act
- If you haven't already done so, here's another call-out to take the latest version of our Survey of User Needs (SUN). I encourage all of our readers to participate as results from this survey are used by engineers and designers to make the next generation of wireless devices, features and services more accessible. Full details and a link to the survey are provided below.
- Upcoming events for research staff:
    - **GSMA Mobile World Congress Americas** - September 12-14, 2018 in Los Angeles, CA.
    - **Georgia Digital Government Summit** - September 20-21, 2018 in Atlanta, GA.

This newsletter is intended to keep you abreast of some of the latest activities in our research, development and training projects, share upcoming dates to events and conferences we'll be attending, and serve as an invitation to all of our readers to participate in surveys, workshops, focus groups or user testing projects we have underway.

Visiting our **website**, subscribing to our **LinkedIn** and **Twitter** feeds, and becoming friends with us on **Facebook** are other great ways to stay informed of our progress!

We welcome you as a reader and hope you enjoy the newsletter! If you are not currently a *Re: Wireless* reader and were forwarded this newsletter, you can join our mailing list below or text WIRELESSRERC to 22828.

Thank you for reading and enjoy the articles below!

Sincerely,

Ben Lippincott (Managing Editor)
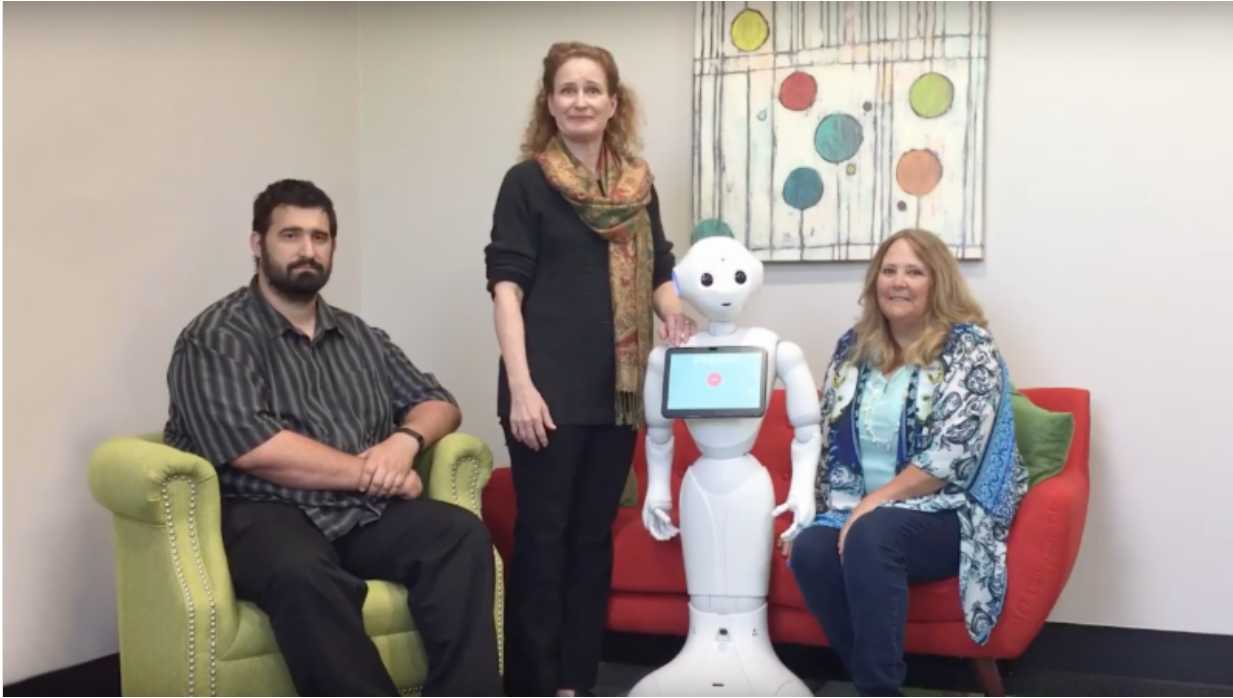
Pepper the Robot Creates Bonds of Trust and Emotion for Humans at Different Age Levels to Improve Quality of Life

Wireless RERC researcher, John Bricout, PhD, who is the director of the School of Social Work at the University of Minnesota, Twin Cities (UMN), and his collaborators at the University of Texas at Arlington (UTA) are investigating the socially assistive capabilities of "Pepper," a versatile 4-foot tall humanoid robot. Pepper can provide social, physical and emotional support for older adults and people with disabilities that helps them have a better quality of life.

Preliminary research, conducted by the Emotional Robotics Living Lab at UTA, focused on interactive engagements with Pepper by having humans act out Shakespearean sonnets with the robot. They found that increases in human-robot social engagement were related to discernible drops in depression following three-week interactions with Pepper. This work paved the way for developmental aspects of the project that Bricout and his UTA collaborators are currently pursuing, on Pepper as a respite robot for older caregivers with adult children who have developmental disabilities.

The collaborative UMN-UTA team is conducting a study to investigate how to engage the attention, trust and comfort of care recipients while providing respite for older adult caregivers. The aim is to have Pepper demonstrate engaging, trustworthy, caring and ethical behavior consistent with the caregiving role. The development team is using a new video of Pepper showing how the robot will talk and move to begin an iterative feedback process for bringing Pepper's behavior into alignment with the expectations of care giver and care recipient. The team will record participants' perspectives and reactions on how Pepper's voice, speech pattern, responsiveness and body movements might impact their care-giving and -receiving interactions with the robot. The team will then go back and modify Pepper's programming for a subsequent live trial and analysis, from which observations and insights can be drawn.

Bricout notes "the broad aim of our work is to extend the capabilities and quality of life of older adults and people with disabilities, leveraged by socially assistive robotics as partners in learning and action."

To read more about Pepper the robot and the collaborative research team, please visit:
https://www.uta.edu/news/releases/2017/11/Greer%20release%20robots.php
[https://www.uta.edu/news/releases/2017/11/Greer%20release%20robots.php]

Smart Clothing Assists People with Visual Impairments

Wireless RERC researchers in The Wearable Computing Center (WCC) at Georgia Tech are currently conducting research on how to design wearable technology interfaces that are accessible and appropriate for use in daily life. In their current work, the WCC researchers are studying how vibro-tactile displays and smart fabric interfaces can be used to support users with visual impairments when interacting with mobile/wearable systems.

Researchers have co-designed an innovative wearable garment, in collaboration with a group of users with visual impairments, which allows them to send and receive information via their sense of touch. Dr. Maribeth Gandy Coleman, Director of the WCC, explains "An important part of the development process has been learning from our users, exploring how they currently use assistive and consumer technology (such as smartphones) and working to create new types of devices that would better meet their needs. The goal of any wearable technology is to gracefully support the user while they do tasks in their daily lives, so it is very important to create innovative user interfaces which don't distract or impede them. That is why we are exploring novel ways of using touch and sound to connect our users with their devices."

The prototype being tested is a fabric sleeve embroidered with touch sensitive buttons with small embedded vibrotactile displays. The development team is investigating how easily and effectively users can use the sleeve to receive and input information while engaged in collaborative tasks with others. It is critical to perform early realistic field evaluations of these emerging wearable devices to ensure that resulting products do not distract the user or those around them and that the aesthetics, wearability, and functionality of the device is desirable to users.

Wireless RERC Seeking Public Input on Leadership Workshop Takeaways

We'd like to hear from our readers! In June, the Wireless RERC completed the Summary Report for Using Technology R&D to Effect Policy Change Leadership Workshop. One of the key goals of the workshop was to provide pragmatic advice on how to engage in the policymaking process. One aspect of engagement includes providing written comments in response to a call for public input. As such, we would like to offer you the opportunity to provide your input on the Small Group Discussions section (pp. 10-13).
In the afternoon, the attendees had small group discussions on the following topics:

1. Data sources at your disposal - organizational data that could provide support for policy recommendations.
2. Disability access policy priorities - policy domains that should be on the regulatory agenda to improve parity of access by people with disabilities.
3. Engaging stakeholders- strategies for encouraging people with disabilities and non-governmental organizations to

participate in federal rulemakings.

Each group was asked to extract from their discussion three takeaways. From your perspectives as advocates, practitioners, academics, government, industry, or consumer stakeholders, we invite you to review the takeaways and submit concurring or opposing arguments. Do you agree with the takeaways that each group produced? Is there a significant issue regarding use of data, disability access policy priorities, or stakeholder engagement that went unaddressed?

We hope that you reply. If you so choose, please send your comments to Salimah LaForce (salimah@cacp.gatech.edu) by August 22, 2018.

A pdf of the summary report of the Leadership Workshop can be found here:

http://www.wirelessrerc.org/sites/default/files/wireless_rerc_leadership_workshop_summary_report_final.pdf
[http://www.wirelessrerc.org/sites/default/files/wireless_rerc_leadership_workshop_summary_report_final.pdf]

Wireless RERC on the Record: Multimedia Content in WEA Messages

June 2018 - The Wireless RERC submitted reply comments to the FCC in response to their Public Notice inviting stakeholder input to *Refresh the Record on Facilitating Multimedia Content in Wireless Emergency Alerts (WEA)* **[PS Docket Nos. 15-91 and 15-94].** The Wireless RERC is in general agreement with comments that supported the inclusion of multimedia content in WEA messages. Despite sometimes having different rationales, many commenters indicated the importance of multimedia message content in motivating people to take appropriate protective actions, and/or advancing accessibility of WEAs to people with disabilities. The Wireless RERC's reply comments acknowledged the remarks of AT&T and CTIA that discussed the technical difficulty and level of effort and resources it would require of wireless industry stakeholders to realize embedded multimedia content. In our reply comments, we urged wireless stakeholders to continue to embrace the changing expectations of public safety officials and the public with regards to an expanded suite of WEA capabilities. The most recent updates allowing for increased character length and the inclusion of URLs are expected to have a positive impact on the accessibility of the message and by extension behavioral response. Adding embedded multimedia content would further enhance WEA messages for people with disabilities and language differences, allowing for multiple cognitive and sensory pathways (visual, auditory, and linguistic) to be automatically engaged for more efficient information processing and reaction.

The Wireless RERC also supported comments made by the Consumer Groups, California Coalition of Agencies Serving the Deaf and Hard of Hearing (CCASDHH), and Gallaudet University RERC on Technology for the Deaf and Hard of Hearing (joint filing) asserting that multimedia WEA messages would be particularly beneficial to people whose primary language is American Sign Language (ASL). In a recently published journal article, *American Sign Language & Emergency Alerts: The Relationship between Language, Disability, and Accessible Emergency Messaging,* extensive reasoning is provided as to why the provision of ASL-translated emergency messages is critical. In sum, WEA messages delivered as an ASL video would allow for immediate and independent access to the message content.

Though there are technical hurdles to address (network and device-based), the Wireless RERC is optimistic that industry, government, academic, and consumer stakeholders will together, develop the technical, policy and practice solutions that will bring accessible multimedia WEA content to fruition.

Read the Wireless RERC's comments here:
http://www.wirelessrerc.org/sites/default/files/wireless_rerc_reply_comments_mutlimedia_content_in_wea_messages.pdf
[http://www.wirelessrerc.org/sites/default/files/wireless_rerc_reply_comments_mutlimedia_content_in_wea_messages.pdf]

Wireless RERC on the Record: Accessibility of Communications Technologies

May 2018 - The Wireless RERC submitted comments to the Federal Communications Commission in response to their *Public Notice In the Matter of The Accessibility of Communications Technologies for the 2018 Biennial Report Required by the Twenty-First Century Communications and Video Accessibility Act* **[CG Docket No. 10-213].** In anticipation of this Public Notice, the Wireless RERC conducted a 2017 Mobile Phone Accessibility Review (Accessibility Review/Review). The Review included mobile phone models available as of September 2017 from the top four wireless carriers, one prepaid carrier, and five Lifeline Carriers. Researchers, using the providers' web pages as a reference,

identified 214 mobile phones for evaluation. Data were collected on 24 accessibility features (or features that impact accessibility) available in each phone model. Wireless RERC comments shared the results of the Accessibility Review. Additionally, the comments were informed by recently conducted focus groups on the use of "new communications technologies" by people with disabilities. Overall, the comments indicate that the accessibility of advanced communications technologies is improving. More accessibility features are available, and many of these features are customizable (e.g., the rate of speech for voice output, vibration adjustment, font adjustment, and more). These are much-appreciated gains. However, a perennial barrier to access, device setup, which quite literally allows the user to gain entry to the device, requires addressing to move the needle forward on people with disabilities' independently accessing advanced communications technologies and services. Following are a few specifics from the comments:

- The researchers encountered difficulty in locating information about certain features. Consumers with disabilities may experience a similar problem when comparing models and selecting a phone to purchase. While people without disabilities can compare phone models based on preferences alone, people with disabilities may have accessibility requirements for the phone to be usable by them (e.g., video calling, HAC, screen reader, AT connection).
- Of the 214 phones, 0% of devices had full, out-of-the-box accessibility. The benefit of full, out-of-the-box accessibility is that it simplifies phone selection for people with varying capabilities and functional levels. If all phones were fully accessible, then people with disabilities could select from all available models. As it stands now, people with disabilities have a more limited selection, and more research is required on the part of the consumer prior to purchase.
- Input type can raise barriers that people with various types of disabilities may encounter when attempting to use mobile phone devices both smart and non-smartphones. Many smartphones require a degree of sight and dexterity that can be a limiting factor to users.
- Various disability groups are increasingly adopting smart speakers with intelligent agents, particularly the Amazon Echo and Amazon Dot with Alexa. Consumers who are blind or who have low vision, for whom graphical interfaces may not be accessible, as well as people with dexterity or mobility-related disabilities, for whom button or touchscreen control may pose a barrier to use, have cited the voice control features of these devices as useful.
- Consumers with limited dexterity or impaired hand function, such as people with spinal cord injury or multiple sclerosis, have indicated the potential usefulness of wearables in their own lives. For example, the ability to use near-field communication (NFC) for payments often simplifies what is a complex task for many users who find handling cash or cards to be difficult. However, they also have noted that complex gestures, such as multi-finger swipes, complicate their use of the devices.
- Consumers with disabilities who use wearables such as the Apple Watch discussed in great detail the effect that operating system updates may have on otherwise accessible or usable apps and menu structures for these devices. In a manner similar to smartphone system updates, users of these devices have expressed a desire to understand the effect of operating system updates on app accessibility through some means other than "trial and error."

Additional Information can be found at:
Read the Wireless RERC's Comments
[https://www.fcc.gov/ecfs/filing/1050793670093]

A PDF of the Wireless RERC's comments:
wireless_rerc_comments_2018_cvaa_implementation_evaluation.pdf
[http://www.wirelessrerc.org/sites/default/files/wireless_rerc_comments_2018_cvaa_implementation_evaluation.pdf]

We Need Your Help! Please Take and Share the Survey of User Needs

The Rehabilitation Engineering Research Center for Wireless Inclusive Technologies (Wireless RERC) has launch its updated Survey of User Needs (SUN). The SUN is the Wireless RERC's cornerstone survey on wireless technology use by people with disabilities. It has been completed by over 7,500 consumers with disabilities since it was first launched in 2001.

This latest version represents the 6th version of the survey, which is updated periodically in response to changes in technology. In addition to questions about cell phone and tablet use, this latest version of the SUN collects information about wearables, "smart" home technologies, and other next-generation wirelessly connected devices.

User responses will help designers and engineers make new wireless devices and services for people with disabilities. Data from the SUN also provides important information to the wireless industry, government regulators, and other researchers to help them make wireless technology more accessible and more useful to people with all types of

disabilities.

If you have a disability, please consider taking this survey. If you know someone who has a disability, please forward the survey to them.

Additional Information:
Take the Survey
[http://b.gatech.edu/2yvCHnz]

Share the Survey
[http://www.wirelessrerc.gatech.edu/wireless-rerc-launches-latest-survey-user-needs]

Save the date!

Upcoming conferences for research staff include:

GSMA Mobile World Congress Americas
September 12-14, 2018 in Los Angeles, CA.
Connect to a Better Future. MWC Americas is not just an event, it is an international gathering of innovative minds with the goal of creating a better future. Attendees will be amazed, motivated and optimistic about the future of mobile technology.
2018 Mobile World Congress Americas
[https://www.mwcamericas.com]

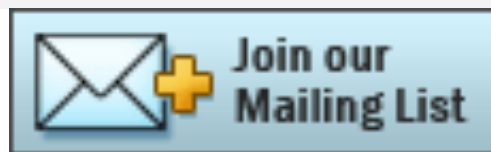**Georgia Digital Government Summit**
September 20-21, 2018 in Atlanta, GA.
Government Technology's passion is helping spread best practices and spurring innovation in the public sector. The Georgia Digital Government Summit is designed to do just that. The summit has an advisory board that gathers public sector and private sector leaders to create an agenda designed to make that passion relevant and actionable to the state and local government organizations attending the summit.
2018 Georgia Digital Government Summit
[http://www.govtech.com/events/Georgia-Digital-Government-Summit.html]

STAY CONNECTED WITH US!

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