

The University of Maine

DigitalCommons@UMaine

General University of Maine Publications

University of Maine Publications

1-29-2021

App from VEMI Lab group will help people with visual impairments, seniors enjoy ride-sharing with self-driving cars

Marus Wolf

Follow this and additional works at: https://digitalcommons.library.umaine.edu/univ_publications



Part of the [Higher Education Commons](#), and the [History Commons](#)

Repository Citation

Wolf, Marus, "App from VEMI Lab group will help people with visual impairments, seniors enjoy ride-sharing with self-driving cars" (2021). *General University of Maine Publications*. 1035.

https://digitalcommons.library.umaine.edu/univ_publications/1035

This Article is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in General University of Maine Publications by an authorized administrator of DigitalCommons@UMaine. For more information, please contact um.library.technical.services@maine.edu.

UMaine News

Want weekly UMaine news updates in your inbox?

[SUBSCRIBE NOW](#)

Recent Posts

University of Maine Center on Aging awarded funding to support 119 AmeriCorps Seniors RSVP volunteers

Published: February 18, 2021

UMaine receives patent for composite laminates bound with cellulose nanofibers

Published: February 18, 2021

Media advance agriculture update Feb. 24

Published: February 18, 2021

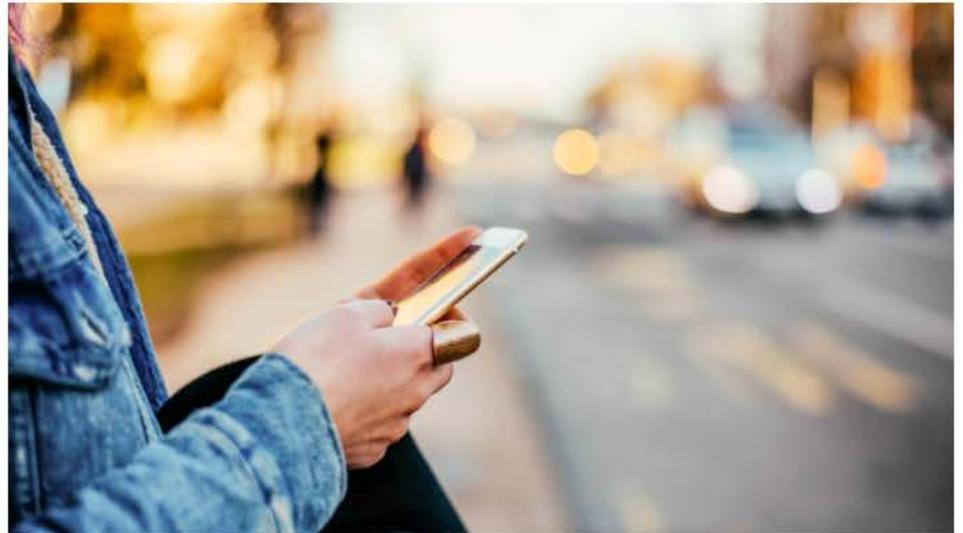
BDN reports concert recorded at Collins Center is 'intriguing visually'

Published: February 18, 2021

Pershing cited in Union Leader report of species prediction for Gulf of Maine

Published: February 18, 2021

UMaine Today



App from VEMI Lab group will help people with visual impairments, seniors enjoy ride-sharing with self-driving cars

January 29, 2021

Self-driving cars will offer access to ride-sharing and ride-hailing with their suite of modern conveniences. However, many people with visual impairments who use these services rely on a human driver to safely locate their vehicle.

A research group led by the Virtual Environments and Multimodal Interaction Laboratory (VEMI Lab) at the University of Maine is developing a smartphone app that provides the navigational assistance needed for people with disabilities and seniors to enjoy ride-sharing and ride-hailing, collectively termed mobility-as-a-service, with the latest in automotive technology. The app, known as the Autonomous Vehicle Assistant (AVA), can also be used for standard vehicles operated by human drivers and enjoyed by everyone.

AVA will help users request, find and enter a vehicle using a multisensory interface that provides guidance through audio and haptic feedback and high-contrast visual cues. The Autonomous Vehicle Research Group (AVRG), a cross institutional collective led by VEMI lab with researchers from Northeastern University and Colby College, will leverage GPS technology, real-time computer vision via the smartphone camera and artificial intelligence to support the functions offered through the app.

The U.S. Department of Transportation [awarded \\$300,000](#) to AVRG for the AVA project through its Inclusive Design Challenge. The [initiative](#) sought proposals for design solutions that would help people with disabilities use autonomous vehicles for employment and essential services. AVRG was one of the semifinalists.



CONIFER CLASSROOM: What are the roles of Maine's University Forests?

"This design challenge was exciting to us as it falls so squarely in our wheelhouse" says Nicholas Giudice, a professor of spatial Computing at UMaine. "We have worked in the areas of multimodal information access and navigation for visually impaired people and older adults for years, and have recently started a research program investigating human-vehicle collaborations for increasing the trustworthiness and accessibility of autonomous vehicles. This development project connects the dots by allowing us to bridge several areas of expertise to ensure that the technology of the future is 'accessible for all.'"

Users will create a profile in AVA that reflects their needs and existing methods of navigation. The app will use the information from their profiles to find a suitable vehicle for transport, then determine whether one is available.

When the vehicle arrives, AVA will guide the user to it using the camera and augmented reality (AR), which provides an overlay of the environment using the smartphone by superimposing high-contrast lines over the image to highlight the path and verbal guidance, such as compass directions, street names, addresses and nearby landmarks. The app also will pinpoint environmental hazards, such as low-contrast curbs, by emphasizing them with contrasting lines and vibrating when users approach them. It will then help users find the door handle to enter the vehicle awaiting them.

"This is the first project of its kind in the country, and in combination with our other work in this area, we are addressing an end-to-end solution for AVs (autonomous vehicles) that will improve their accessibility for all," says Giudice, chief research scientist at VEMI Lab and lead on the AVA project. "Most work in this area only deals with sighted passengers, yet the under-represented driving populations we are supporting stand to benefit most from this technology and are one of the fastest growing demographics in the country."

AVRG studies how autonomous vehicles can meet various accessibility needs. [VEMI lab](#) itself has explored tactics for improving consumer trust in this emerging technology.

AVA advances both groups' endeavors by not only providing another means for people with visual impairments and other disabilities and seniors to access self-driving vehicles, but also increases their trust in them. The project also builds on a seed grant-funded, joint effort between UMaine and Northeastern University to improve accessibility, safety and situational awareness within the self-driving vehicle. Researchers from both universities aim to develop a new model of human-AI vehicle interaction to ensure people with visual impairments and seniors understand what the autonomous vehicle is doing and that it can sense, interpret and communicate with the passenger.

The app will offer modules that train users how to order and locate rides, particularly through mock pickup scenarios. Offering hands-on learning provides users confidence in themselves and the technology, according to researchers. It also gathers data AVRG can use during its iterative, ongoing development for AVA and its integration into autonomous vehicles.

"We are very excited about this opportunity to create accessible technology which will help the transition to fully autonomous vehicles for all. The freedom and independence of all travelers is imperative as we move forward," says VEMI lab director Richard Corey.

VEMI Lab, co-founded by Corey and Giudice in 2008, explores different solutions for solving unmet challenges with technology. Prime areas of research and development pertain to self-driving vehicles, the design of bio-inspired tools to improve human-machine interaction and functionality, and new technology to improve environmental awareness, spatial learning and navigational wayfinding.

Contact: Marcus Wolf, 207.581.3721; marcus.wolf@maine.edu

Share this:



**Division of Marketing and
Communications**
5703 Alumni Hall
Orono, ME 04469-5703

Tel: 207.581.3743
Fax: 207.581.3776

[Home](#)
[Submit news](#)
[Podcast](#)

[UMaine Today Magazine](#)
[Subscribe](#)
[Contact](#)



[Apply](#)

[Student Resources](#)

[Nondiscrimination notice](#)

[Clery Safety and Security Report](#)

[COVID-19 Risk Statement](#)

[Emergency](#)

[University of Maine](#) | [Orono, ME 04469](#) | [207.581.1865](#)