

Navatar Glass app may help blind individuals navigate indoor environments

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Graduate student Ilias Apostolopoulos, wearing Google Glass, works with associate professor Eelke Folmer on their Navatar Glass app, a wearable computer technology developed at the University of Nevada, Reno to help the blind navigate indoor environments. Credit: Mike Wolterbeek, University of Nevada, Reno.

Navatar, a technology developed at the University of Nevada, Reno to help the blind navigate indoor environments, may become more usable, accurate and non-obtrusive using the popular wearable computing technology called Google Glass.

"As an extension of my research on [wearable computing](#), we will develop a Navatar Glass App designed to give users a more efficient way to navigate indoor spaces," Eelke Folmer, researcher and assistant professor in the University's College of Engineering, said. Folmer received a prestigious \$40,000 Google Research Award, one of 105 awards out of 550 applicants.

Folmer, his colleague Kostas Bekris of Rutgers University (formerly of University of Nevada, Reno) and doctoral student Ilias Apostolopoulos had previously developed Navatar, a low-cost indoor navigation system for users who are blind. Navatar

allows for localization and navigation by using the physical characteristics of [indoor environments](#), taking advantage of the unique sensing abilities of users with visual impairments, and utilizing minimalistic sensing achievable with low cost sensors available in smartphones.

Navatar will be modified to be used on Google Glass, a hands-free, head-mounted device that can be worn as eyewear. Using Google Glass will free up one of the user's hands while navigating, which may help with more accurately confirming the presence of landmarks along the provided path and improve the localization accuracy of the system.

"Our research is motivated by the belief that a disability can be turned into an innovation driver," Folmer, a computer-science and engineering department faculty member, said. "Similar to how Velcro was invented when mankind tried to put a man on the moon, I believe that when solving hard interaction design problems for users with unique, extreme abilities, such as blind users, there is a large potential for discovering solutions that may benefit anyone. Though Navatar was specifically developed for users with visual impairments, sighted users can also use it with a potentially higher localization accuracy."

Google Research Awards are one-year awards structured as unrestricted gifts to universities to support the work of world-class full-time faculty members at top universities around the world. Folmer's project was one of the three projects mentioned in the official announcement of these awards.

The Navatar on Glass project is a timely research project with a high social impact, as the number of blind people is expected to double in the next decade. This award will strengthen Folmer's collaborations with Google researchers and may open up internship opportunities for participating graduate students. Folmer's research is centered

on human-computer interaction specifically focusing on assistive technology, wearable computing, haptics and video games.

More information: For more information about Folmer's research visit his website at eelke.com/

Provided by University of Nevada, Reno

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