The University of Florida is seeking companies interested in commercializing hardware and software that can track the location of mobile devices such as smartphones and tablets indoors. Global Positioning System (GPS) technology, used for military, civilian, and commercial purposes including reconnaissance and navigation, does not function well inside buildings. Dense overhead objects act as impenetrable barriers, wreaking havoc on satellite signals. Researchers at the University of Florida have developed software and hardware to pinpoint indoor locations of mobile devices with accuracy of two inches - by far the best result in the world for smartphone-based indoor localization and navigation. Using a simple downloadable application (app), mobile devices can deliver location-based services such as high-precision indoor navigation, virtual guidance, and location-based notification and information access. Consumers will benefit from the increased flexibility that indoor GPS tracking technology provides.

Application
Software and hardware that can track the location of mobile devices inside buildings

Advantages
- Provides high-precision indoor localization (two inches), navigation and automatic location-aware information access
- Utilizes existing mobile technology, requiring zero investment from the user except downloading an app
- Converts mobile devices into a companion for smart life with location-based services indoors

Technology
Global Positioning System (GPS) technology is severely limited by solid overhead structures that obstruct signal transmission between satellites and mobile devices. Available technology does not allow users to accurately track their locations inside buildings. Researchers at the University of Florida have developed software and hardware that employ inaudible sound for accurate indoor localization. The new technology allows a wide range of mobile devices to receive these signals from indoor positioning anchors. An acoustic beacon is modulated via coded sharp-pulse in the boundary band of audio and ultrasound signal for high timing accuracy, multipath resolution and low energy consumption at a frequency imperceptible to human ears. The frequencies will vary between 17 kHz and 20 kHz – outside the range of human hearing, but still detectable by common consumer communication devices. The mobile app passively captures these acoustic signals and performs real-time frame-based adaptive filtering and multi-resolution analysis for less noise/interference and longer operating ranges.
The Inventors

Xiaolin (Andy) Li, Ph.D., is an Associate Professor in the Department of Electrical and Computer Engineering at the University of Florida. He is the Director of Scalable Software Systems Laboratory (S3Lab). Dr. Li’s research interests include cloud computing, cyber-physical systems, mobile social networks, mobile privacy and future Internet. He earned a Ph.D. in Communications and Information Engineering at the National University of Singapore, and a Ph.D. in Computer Engineering at Rutgers University. He is a recipient of NSF CAREER Award 2010.

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About the Office of Technology Licensing

The amount and diversity of research taking place at the University of Florida generates an average of 300 new discoveries every year. The successful commercialization of these discoveries requires considerable time, effort and resources, and is dependent upon partnerships with commercial entities. During the three decades since the landmark Bayh-Dole Act of 1980 authorized and encouraged universities to commercialize their discoveries, the University of Florida has become a national leader in moving faculty research into the marketplace. Since its inception, the University of Florida Office of Technology Licensing (OTL) has helped to transfer hundreds of technologies from university laboratories to private industry. Noteworthy examples include the famous sports drink Gatorade®, the glaucoma drug Trusopt®, and the termite-colony elimination system Sentricon®. By helping to move technologies out of the laboratory and into the marketplace, OTL helps the university achieve its mission of transferring knowledge for society’s benefit while improving the lives of people around the world. We pride ourselves in our reputation as a leader in commercializing discoveries that are curing diseases and making the world a better place.

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