

# NTT & NTT DATA develop tactile technology for indoor/outdoor navigation

- Unveiling at NTT's International R&D forum in Tokyo on Feb. 16-17 -

Feb. 13, 2017

NTT DATA Corporation

Tokyo and Milan, February 13, 2017 - NTT DATA and NTT jointly announced today their development of a revolutionary tactile-navigation technology that will enable devices and solutions to use asymmetric vibrations to provide indoor/outdoor navigation. An original device being developed jointly by GiPStech, NTT DATA and NTT integrates Buru-Navi's tactile technology developed by NTT with GiPStech's geomagnetism-based indoor localization technology. The extraordinary handheld device, which is designed as a cover to fit over and integrate with a common smartphone, guides people through indoor environments by using multidirectional vibrations to literally lead them by hand to their destination.

The technology has a wide range of useful applications in industry and in public, including safety (guiding people out of buildings during fires or power outages), culture (in museums and cities as an advanced personal guide for discovery of points of interest based on personalized interests), and social integration (a virtual guide dog for the visually challenged).

The first practical demonstration will be held during the International R&D forum that NTT will organize for the public in Tokyo on February 16 and 17. On this occasion, an Italian-Japanese team will present the solution being developed in the laboratory of NTT DATA Italy. Once the last testing phase is finished, the new solution is expected to launch in global markets soon.

## Collaboration with GiPStech produces next-generation solution

In recent years, a wide range of location, navigation and positioning systems for outdoor use have appeared, enabled by expensive constellations of GNSS satellites. However, since GPS signals cannot reach indoors, there is still a need for a seamless solution capable of navigating indoors. So far, technologies developed for indoor navigation have been too imprecise, or too expensive due to the need to add a large number of sensors to the device. Moreover, all current navigation systems rely on visual maps and audio prompts, like those used in cars, which limits their usefulness for the visually or acoustically impaired. The next-generation solution developed by GiPStech, NTT DATA and NTT overcomes these limitations by using haptic-feedback navigation and high-precision, hybrid geomagnetic localization technologies.

## Technical details

Buru-Navi (buru is an onomatopoeic expression for "vibration" in Japanese) is a unique technology that employs asymmetric vibrations to create the feeling of being pulled in a specific direction, as if the device were leading the user by the hand. Buru-Navi haptic feedback developed by NTT provides users with navigation guidance without any need for map-based support. The newly announced solution is revolutionary not only for the remarkably small size and weight of the device, but also as the first-ever deployment of Buru-Navi technology for navigation in combination with other devices, including smartphones. It is especially useful in smoky or dark environments where vision is poor, enabling users to find their way out of somewhere, or the shortest route to somewhere, or to a specific object.

GiPStech's hybrid geomagnetic indoor localization boasts high precision and usability thanks to its reliance on earth's magnetic field and the use of sensors that are already present on today's smartphones. Consequently, one of its distinct advantages is that it does not require the installation of dedicated infrastructure.

GiPStech's patented algorithms interpret distortions created by ferromagnetic elements in building materials, using them as a magnetic fingerprint to generate a building map for localization and navigation. The resulting data is then merged with inertial measurements gathered by the smartphone's accelerometers, enabling the solution to pinpoint precise locations even in data-noisy conditions (near operating elevators, etc.). For enhanced performance, the system also can integrate existing Wi-Fi or beacon technologies.

The device currently being tested comprises a smartphone and special cover equipped with magnetic-field sensors and haptic hardware.

## Further developments

The technology demonstration during the NTT R&D Forum will showcase a variety of applications in complex environments. Going forward, NTT DATA Corporation will carry out market development and field testing in Japan, while NTT DATA Italy will continue to refine the solution and conduct tests and demonstrations throughout the world until this June. Thereafter, the results will be used to determine practical uses and actual applications.

## About NTT DATA

NTT DATA is a leading IT services provider and global innovation partner headquartered in Tokyo, with business operations in over 50 countries. Our emphasis is on long-term commitment, combining global reach with local intimacy to provide premier professional services varying from consulting and systems development to outsourcing. For more information, visit [www.nttdata.com](http://www.nttdata.com)

## About GiPStech

A start-up company that specializes in indoor localization and navigation. A spin-off of University of CALABRIA in Italy, they received multiple international awards including an evaluation of having the highest performing "infrastructure-free" localization technology at GeIoT2016 where they presented their patented hybrid geomagnetic technology. Their solutions have been adopted by more than 10 companies in Italy and are currently being deployed in EMEA and USA. ([URL:www.gipstech.com](http://www.gipstech.com) ([External Link](#)))

## Notes

- \* Buru-Navi is a registered trademark of Nippon Telegraph and Telephone Corporation.

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