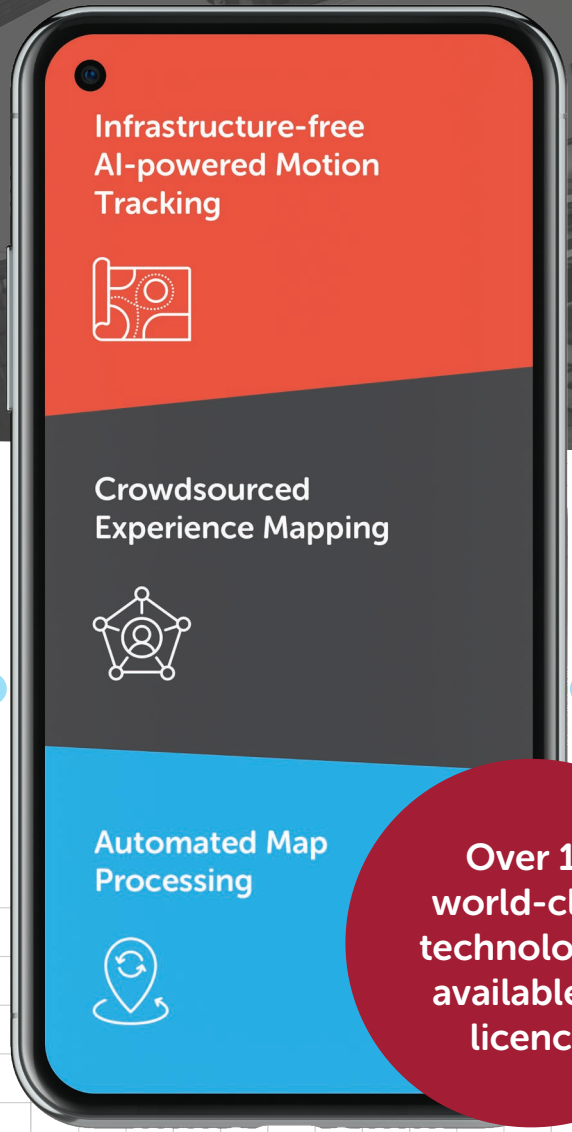
navenio

OEM Indoor Location and Mapping Technology

Our passion is to change the way we experience the indoor world

Professor Niki Trigoni
CTO of the Year, Women in IT Awards 2020



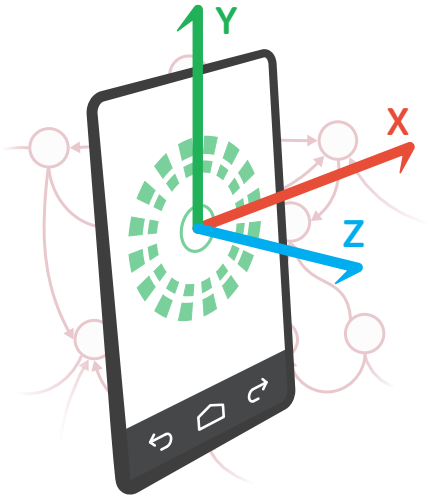
Navenio's location technology is a powerful tool wherever you want to utilise and benefit from indoor location data for different users and applications. Navenio works where GPS does not - the ground-breaking location technology is highly accurate, to within just a few metres, and by being infrastructure-free it removes all barriers to enable rapid scalability.

Navenio has a wide range of IP it can licence to OEMs covering Infrastructure-Free Localisation of People, Trolleys, Vehicles and Assets; Signal Map Automation; Physical Map Automation and more.

University of Oxford · NHS · sodexo · mitie · KPMG British Tech Pioneer 2020 FINALIST · Women in IT Awards CTO of the Year WINNER · Innovate UK Technology Strategy Board · BT · serco · Cognizant

navenio

Infrastructure-free Localisation using just a Smartphone



AI-Powered Motion Tracking

- Robust odometry across people, trolleys and vehicles
- Uses IMU data from a smartphone's sensors for navigation
- PDR algorithms adjust for the different ways a smartphone is held and overcome sensor noise to derive accurate user movement
- Deep learning based pose estimation can use inertial data only (acceleration and gyroscope) for continuous asset tracking – e.g. for trolley motion estimation
- In environments where both inertial and camera data are available, deep learning visual inertial odometry approaches offer low drift odometry for vehicles and robots, as well as for people using VR/AR applications

Award-winning Map Matching

- Patented map matching algorithms constrain a user's odometry to the features of the map
- Works with noisy trajectories and floorplans where changes may have occurred

Indoor-outdoor Detection

- Uses a fusion of inertial, GPS and Wi-Fi data to accurately detect the time/place of entry and exit into a building
- Algorithms work when we do or do not have knowledge of the location of entry/exit points

Multi-floor Localisation

- Algorithms can localise people across multiple floors without prior knowledge of floor change transitions
- Using pressure, inertial and signal map data, Navenio's technology identifies floor change transitions and what floor a user is moving to

3D Localisation without Maps

- Experience maps are built via crowdsourcing users' movements using inertial, pressure, Wi-Fi, BLE and GPS data
- Using a Wi-Fi or BLE scan, Navenio's technology can detect the 3D location of a user on an experience map

Map Automation - with or without a Physical Map

Automated Map Feature & Semantic Data Extraction

- Can detect feature extraction from CAD plans e.g. location of doors/staircases
- Applies text extraction techniques to understanding a CAD plan e.g. relevant building names and floor detail
- Identifies points of interest and traversable space

Automated Map Stitching & Alignment

- Can automatically stitch together a campus layout comprising tens of CAD plans from multiple nearby buildings and user data
- Automatically aligns multiple floors on top of each other

Automated Multi-building Geo-referencing

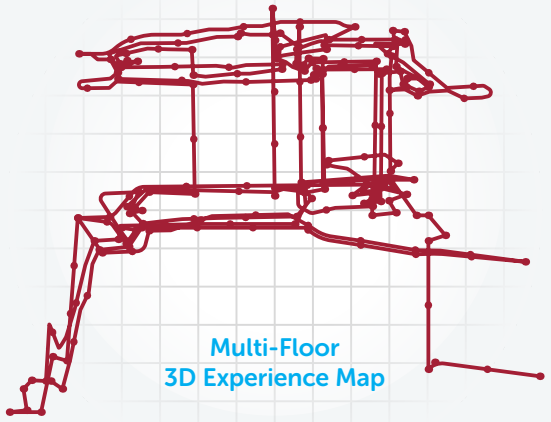
- Can automatically geo-reference each building from a single site or campus layout either from building outlines or by using data and patterns from users' movements, namely experience maps

Signal Map Generation & Alerting without Surveys

- Crowdsources radio signals from users to automatically generate building signal maps
- Navenio can notify when features such as Wi-Fi access points have changed and use crowdsourced user trajectories periodically to update Signal Maps with no manual effort

Experience Mapping - Removing the Need for any Physical Map

- Navenio has removed the need for physical building maps
- Experience maps are built via crowdsourcing users' movements using inertial, pressure, Wi-Fi, BLE and GPS data
- Noisy trajectories are removed and users' trajectories are optimised into a single experience map that show the main thoroughfares
- Experience maps can be generated across multiple floors in 3D
- Navenio's technology is therefore able to prepare buildings for indoor localisation remotely without ever visiting them



Multi-Floor
3D Experience Map

navenio

Other Services

Integration friendly

Our location technology can be integrated into multiple apps and platforms. The Navenio OEM model gives access to our IP, know-how, APIs, and relevant algorithms, all supported by Professional Services from our team of experts

Privacy & Security

Privacy and security are inherent in Navenio technology and we are committed to protecting all confidential data. Navenio is Cyber Essentials certified, NHS Data Security and Protection Toolkit, and GDPR compliant

NHS Digital toolkit

CYBER ESSENTIALS CERTIFIED PLUS

Additional licensable components from a wide variety of Navenio's applied technology:

Scheduler Service: schedules tasks in real-time on the basis of 'right person, right time, right place'

Infrastructure-free Asset Detection Service: uses people's smartphones to track assets

Venue Service: location-only app that can be integrated into different platforms and apps to provide details of staff presence, proximity and audit services. Integrates with SSO solutions

Built from Experience - Applicable Anywhere

Navenio's experience in dealing with some of the most complex structures, for example a 5000+ room hospital, ensures that our technology can be used effortlessly in any type of building and applied to any sector globally

Smart City | New Retail | Logistics | Hospitality | Healthcare

UNIVERSITY OF OXFORD

Built on Award-Winning University of Oxford Science

Our academic founder, Professor Niki Trigoni has been a long-standing Professor of Computer Sciences at the University of Oxford. Her years of work in Oxford's Cyber Physical Systems group, which she founded, has won several awards. She also co-directs the Centre for Doctoral Training in Autonomous and Intelligent Machines and Systems. Her work has led to 145 publications, including several best paper awards, and serving on the Technical Program Committee of major conferences in the field of Indoor Location.

info@navenio.com
www.navenio.com
+44 (0)1865 601934