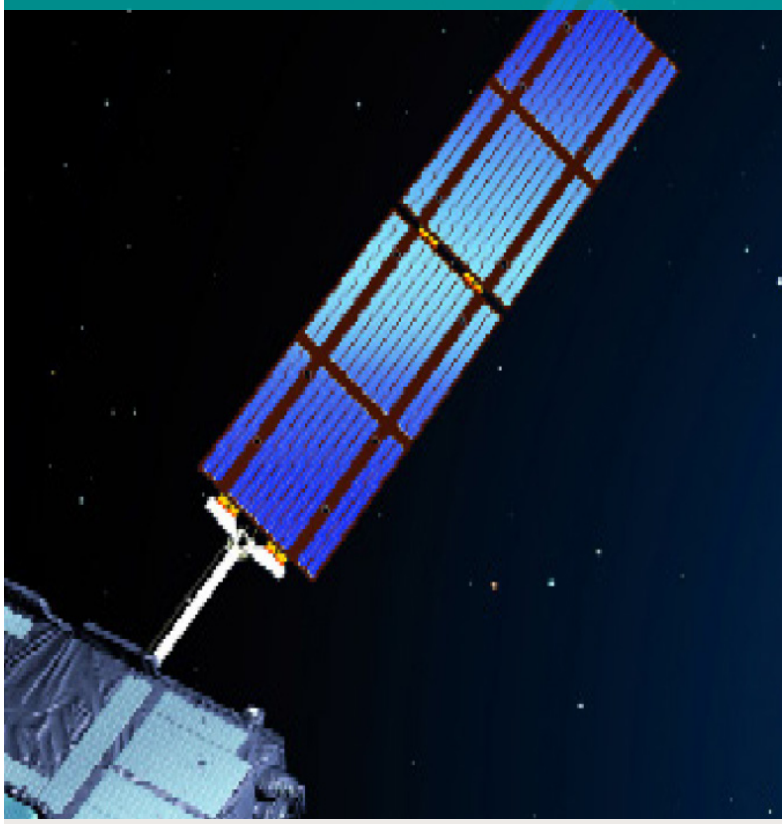
جامعة الملك عبدالله
للعلوم والتقنية
King Abdullah University of
Science and Technology

TECHNOLOGY OPPORTUNITY



Low Cost, Light Weight Integrated Indoor-Outdoor Tracking and Monitoring System

Economic and universal localization base for context aware services

The KAUST system aims to provide first ever integrated outdoor and indoor localization services on inkjet printed wearable, flexible, light weight, low cost and miniaturized TAGs that can be easily and securely monitored over internet enabled devices of common use such as smart phones, IPADs, PDAs, PCs etc. These TAGs feature cutting edge SiRFstarIV GPS technology for outdoor localization and a novel Wi-Fi based non line of sight indoor tracking algorithm capable of providing accurate indoor location even in sparse density of reference Wi-Fi access points. The indoor localization algorithm uses an offline radio-map for characterization of desired indoor locations. Location data from each TAG and associated device ID is transmitted to a central location server. This data is made available to monitoring devices through a sturdy security and authorization shell, on a user-friendly interface featuring Google maps.

Benefits

- First end-to-end universal indoor-outdoor tracking system, featuring seamless integration and novel indoor localization algorithm
- Secure and user friendly monitoring frontend, accessible over all internet enabled devices such as PCs, smart phones, tablets etc.
- Low cost fabrication using novel inkjet printing technology for rapid and economical volume production. The developed system requires no or minimal additional infrastructure, leading to an affordable solution

Applications

- Child and juvenile location tracking
- Elderly location tracking
- Pet location tracking
- Tracking and monitoring of military personnel, employees, or vehicles
- Monitoring of crowds during large events
- Customized tracking solutions for theme parks, shopping malls, etc.
- Maritime tracking
- Tracking of products throughout a supply chain
- Tracking of equipment and other assets
- Navigation/location aware reminders

Opportunity

This technology is part of KAUST's technology commercialization program that seeks to stimulate development and commercial use of KAUST-developed technologies.

Opportunities exist for joint development, patent licensing, or other mutually beneficial relationships.

For More Information

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Technology Details

The outdoor GPS-based tracking component has been executed on a PCB (printed circuit board) platform. The feasibility of this prototype was demonstrated during a pilot executed in July, 2012. A conceptual design of Wi-Fi based tag for indoor tracking is complete. The next phase of the system's development is implementation of the Outdoor TAG through inkjet printing on paper and testing of a prototype indoor Wi-Fi based device, followed by integration of these two systems. The integration of both indoor and outdoor tracking in a single device is a key competitive advantage. Thus, the project seeks to finalize and deploy a pilot-scale system at KAUST and host several demonstrations of the system during the first two quarters of 2013 for in-Kingdom stakeholders focusing on Saudi Industry.

How It Works

Outdoor positioning system is structured around four key components i.e. End-Device, GSM Network, Server and monitoring devices. End-device searches visible GPS satellites and determines position using the latest SIRF-Star IV technology. It then transmits this position information to nearest GSM tower, using GPRS. GSM Network relays the position information to a central server, which makes it accessible over internet to a host of monitoring devices such as PCs, Mobile Phones, and PDAs.

Why It Is Better

The existing market solutions do not commonly support indoor and outdoor tracking in a single device, have higher device cost, are infrastructure intensive and are less user friendly. Our solution addresses these problems by offering an integrated outdoor and indoor tracking device that is wearable, low cost, light weight and miniaturized due to novel inkjet printing technology. In addition, we provide an end-to-end solution including a user friendly monitoring front-end that is accessible on all internet enabled gadgets such as PCs, smart phones PDAs etc. Our system also features a novel method for non-line-of-sight indoor tracking.

IP Protection

KAUST has patents pending for this technology.

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INNOVATION AND ECONOMIC DEVELOPMENT