LTE-IMU Based Indoor Localization Technology

Tech ID: 34086 / UC Case 2020-344-0

BRIEF DESCRIPTION

An innovative approach to indoor localization using LTE signals and IMU data, enhancing accuracy and reliability for navigation.

FULL DESCRIPTION

This technology introduces a novel indoor localization system that leverages broadband LTE communication signals in combination with Inertial Measurement Unit (IMU) data. By utilizing a unique LTE-IMU framework, the system accurately determines the position of a receiver indoors, overcoming the limitations of GNSS signals. It features two distinct designs for LTE receivers based on code phase and carrier phase measurements, and employs an extended Kalman filter (EKF) for tightly-coupled fusion of LTE and IMU measurements, enabling precise state estimation of the navigating receiver.

SUGGESTED USES

- Emergency response systems for accurate indoor localization of callers and responders.
- Indoor navigation solutions for malls, airports, and large public buildings.
- Location-based services and applications requiring precise indoor positioning.
- Enhanced security and surveillance systems through accurate indoor tracking.
- Autonomous robots and drones navigation within indoor environments.

ADVANTAGES

- Enhanced indoor localization accuracy using LTE and IMU data.
- Ability to overcome GNSS signal attenuation indoors.
- Reduction of multipath-induced errors through advanced signal processing.
- Correction of unknown clock biases in LTE eNodeBs without additional infrastructure.
- Utilization of an extended Kalman filter for precise navigation state estimation.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,199,630	12/14/2021	2020-344

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OTHER INFORMATION

CATEGORIZED AS

- **Communications**
  - Networking
  - Other
- **Sensors & Instrumentation**
  - Analytical
  - Physical Measurement
  - Position sensors
- **Transportation**
  - Automotive
  - Other
- **Engineering**
  - Other

RELATED CASES

2020-344-0

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