Overview

Autonomous transit systems promise availability of safer, more cost-effective transport. Mission-critical command and control of autonomous vehicles will require enhanced faster, more reliable communications

Challenge

Self-driving vehicles present a spectrum of challenges for communications systems. Guaranteeing delivery of information needed for safe command and control of autonomous vehicles can be undermined in part because Wi-Fi and LTE technologies are not optimized for mobile assets.

Solution

TransAir SDR-2400 is a software-defined radio purpose-designed for modern transportation systems including command and control of autonomous vehicles. It provides ultra-reliable, low-latency communications through software-defined controllability.

Benefits

TransAir SDR-2400 guarantees delivery of urgent and timing-sensitive information. Software-defined controllability also gives operators the flexibility to adjust deployments (e.g.adjust for reliability or latency requirements) to their operational needs and as requirements change over time.

Software-defined radio for command and control of autonomous vehicles

TransAir™ SDR-2400 guarantees ultra-reliable, low-latency communications

Command and control of self-driving vehicles is dependent on fail-safe, high-speed connectivity. Inherent limitations of current technologies can prevent critical vehicle-to-infrastructure communications creating operational risk and undermining the core value proposition of self-driving vehicles and transit systems. Despite the promise of imminent upgrades to communication infrastructures, progress outside initial test areas has been slow. For municipalities and organizations working to integrate autonomous vehicles into transit systems in the near future, an alternative approach to communications is needed.

LILEE Systems'TransAir SDR-2400 is a software-defined radio, purpose-designed to provide broadband access with guaranteed latencies that satisfy and exceed requirements for command and control of self-driving vehicles. Software-defined controllability gives operators the flexibility to configure communication parameters to meet operational and infrastructure requirements. TransAir SDR-2400 is available as an interface card and provides modular extensibility to TransAir LMS-2450-ME-100.

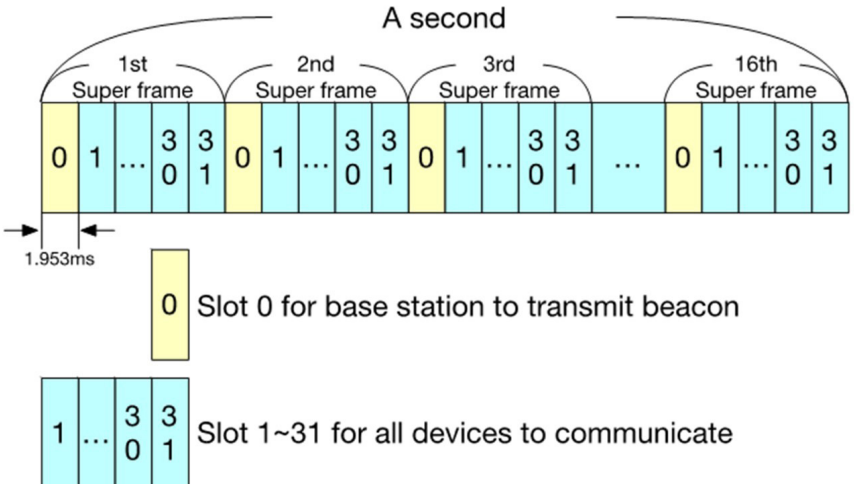
Solution Approach

LILEE Systems' TransAir SDR-2400 is the first available communications technology that delivers guaranteed, ultra-reliable, low-latency communications. The radio works through software-defined controllability to guarantee delivery of high-priority packets with latencies that meet and exceed requirements for command and control of self-driving vehicles. Quality of service is achieved by eliminating medium access unpredictability that comes with contention-based technologies.

Features include:

1. Operates in worldwide unlicensed 2.4 Gz frequency band to eliminate dependency on provider frequency and achieve best balance between range and performance

2. TDD/TDMA-based medium access Configurable time slot length and super frame structure; dynamic slot allocation mean that devices can communicate without complications arising from unpredictable bandwidth process (see figure)



3. MIMO (Multiple-Input, Multiple Output) Radio Configurable MIMO modes including 2x2, dual 2x2 and 4x4, enable operators to configure system for higher spectrum efficiency or longer ranges

4. Modulations and data rates: OFDM with BPSK, QPSK, 16-QAM, 64-QAM; 16 kHz sub-carrier

5.Cloud-based management supported in LILEE Systems T-Cloud portal with access to variety of tools and statistics

Benefits

Super-low latency, under 3 ms, for mission-critical safety applications and command and control of autonomous vehicles

Proven in successful closed-loop autonomous transit pilots, including routes in urban and more remote areas.

Eliminates medium access unpredictability caused by contention-based protocols

Guaranteed slot time to avoid latency and bandwidth fluctuation (or variance) due to unsupervised resource allocation

Remote upgrades and management from a centralized cloud location

Summary

LILEE's new software-defined radio is communications technology purpose-designed for next-generation transportation. Configurable software-based controls deliver performance while enabling operators to customize radio configurations for specific operational requirements

Questions?

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