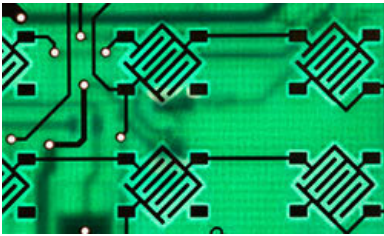


Bistatic Radar for Tracking a Moving Target using Signals of Opportunity

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Abstract

Bistatic radar for tracking a moving target uses a signal of opportunity through Doppler shift to determine a limited sight target's position and trajectory while simultaneously reducing the ability of the target to detect tracking attempts.

Problem

Tracking a moving target with no line of sight requires generating a fixed radio or infrared frequency transmission. Introducing these signals allows for target tracking, but also enables a wary or prepared target to detect the signals.

Solution

With this technology, a signal of opportunity such as Wi-Fi can be used to determine the target's position and trajectory, while simultaneously remaining more covert and reduce the ability of the target to detect tracking attempts.

Value Proposition

The minimal hardware required for this invention reduces costs compared to existing products. Commercializing it specifically for indoor surveillance with minimal lines of direct sight allows for better security.

Benefit

Security and surveillance concerns have led to interest in remotely tracking a moving target in a place in which there is no line of sight, such as different rooms. Tracking a moving target where there is no line of sight is difficult and usually requires a generation of a fixed radio frequency or infrared frequency transmission. Introducing a new signal into an environment with no line of sight allows for a target to be tracked, but also enables a wary or prepared target to detect the produced signals. With this technology, a signal of opportunity that is already in place, such as Wi-Fi, can be utilized to determine the target's position and trajectory, while simultaneously reducing the ability of the target to detect tracking attempts. By using a fixed radio frequency transmission signal, the Doppler shift of a moving target may be received. The extracted Doppler shift comes from the change of electromagnetic signals from, e.g., Wi-Fi connections to change the channel. By detecting changes in the channel, it is possible to detect intrusions and determine the position and velocity of the target without a direct line of sight.

Implementation of this technology allows users to remain more covert than is possible with more traditional technologies. The minimal hardware required for the use of this invention reduces costs compared to existing products as well. Commercializing it specifically for indoor surveillance applications, like those of warehouses and other industrial environments with radio-reflective robots and drones, with no line of sight between the tracking device and the target, can allow for more effective security surveillance.

Market Application

Institutions involved with security, defense, or military tasks may be interested in this invention. Companies in this segment pertain to the following industries/markets: Thermal Imaging, Radar Imaging, Security Detection Systems, and Passive Radar

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Intellectual Property

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