

Elektrotechnik-Elektronik-Informationstechnik

EEI KOLLOQUIUM

Multitone Firefly Time Synchronization for Responsive Vehicle-Protection Jammers

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Donnerstag, der 28.02.2013, 17⁰⁰ Uhr (Sondertermin)

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Diskussionsleitung: Prof. Dr.-Ing. Robert Schober

In this talk, we address the problem of time synchronization between multiple responsive communications jammers employed for vehicle protection against radio-controlled improvised explosive devices (RCIEDs). Unlike barrage jammers, which continuously transmit jamming signals on pre-defined frequency bands, responsive jammers periodically perform fast wideband scans of the radio spectrum and are thus able to react to observed threat signals. In order to avoid a ring-around effect when multiple responsive jammers are active during a common mission, we present a fully distributed time synchronization scheme, which is based on the 'firefly' synchronization mechanism known from the area of wireless communication networks. In particular, we briefly discuss the design of the underlying phase response function, consider certain trade-offs concerning the choice of parameters, and define a suitable fine-synchronization mechanism. Finally, simulation results are presented which illustrate the excellent performance of the proposed synchronization scheme as well as its robustness with regards to practical considerations.