

Radar Technology | Technology Offer

Modulation Symbol Based Processing Algorithm and Instrumentation for OFDM Radar

Field of Application

The present innovation comprises a novel digital processing algorithm as well as a device which make it possible to undertake radar measurements using OFDM signals with very high dynamics and very high process gain. This makes it possible with a single broadcast signal to simultaneously transmit information and carry out radar measurements. The process opens up interesting new possibilities in traffic telematics but, beyond this field of application, may also be used in other civil and military applications.

Current Status of Technology

Currently used radar concepts using analogue technology, such as chirp, pulse or FMCW radar, are largely mature and optimized. The major progress made in the power of digital signal processing opens up entirely new possibilities regarding the forming of novel emission signals as well as regarding complex processing algorithms. The capabilities of future radar systems will therefore be largely determined by the application of new signal forms as well as new processing procedures.

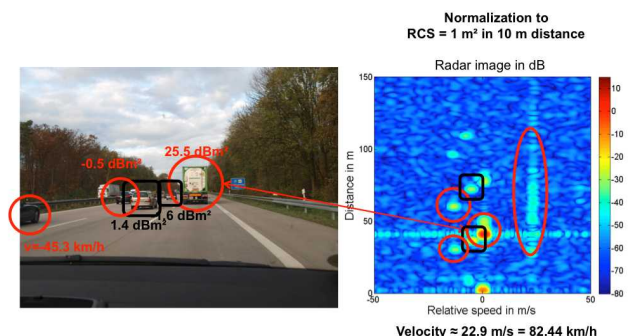
Until now, OFDM radar concepts were hampered by the disadvantage that the achievable dynamics depended on the autocorrelation properties of the emitter signal which limits the system dynamics significantly, particularly in the case of simultaneous information transmission.

Innovation

The invention rests on an algorithm which executes a radar measurement based on the sent and received modulation symbols of an OFDM signal. Building on this, a system concept was developed which emits digitally coded information and at the same time computes a radar image of the environment by means of the signals reflected by objects in the surrounding area. This newly developed algorithm allows the simultaneous, clear and independent determination of distance and speed of all reflecting objects, with these two measurements being completely independent from each other. The procedure also delivers a high process gain through integration over time. The system concept and the processing algorithm were verified by means of computer simulations as well as with a prototype demonstrator.

Your Advantages at a Glance:

- Reliable operation with simultaneous radar function and information transmission
- The performance of the radar processing is independent of the information being sent
- No special coding is necessary – the OFDM signal can be modulated with any data
- High processing gain and minimal interference with other systems
- Achieving a high dynamic range
- Distance and speed are being processed independently of and decoupled from each other
- Relatively moderate computational complexity



Technology Transfer

The Technologie-Lizenz-Büro GmbH has been charged with the commercialization and now offers companies the opportunity to obtain a license to exploit this new technology.

Patent Portfolio

German patent (DE 10 2009 019 905 A1) and international PCT application

For further information, please contact: Ulrich Bass

bass@tlb.de

Technologie-Lizenz-Büro (TLB)
der Baden-Württembergischen Hochschulen GmbH

Ettlinger Strasse 25, D-76137 Karlsruhe, Germany
Tel. +49 721 79004-0, Fax +49 721 79004-79
www.tlb.de