CLION - Advanced Radar Imaging and Sensor Integration

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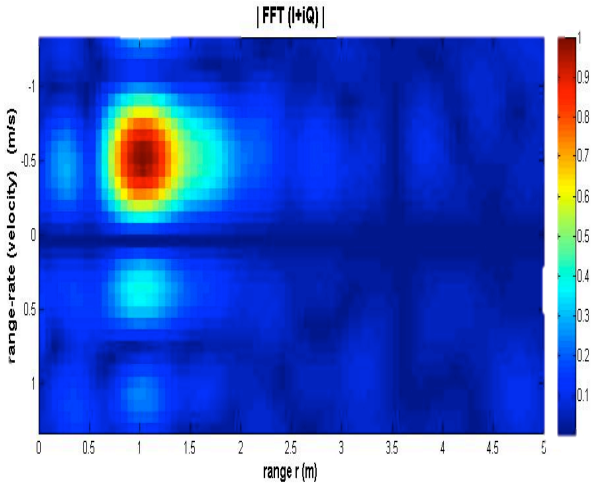
'Pocket Radar version 0.3, 1/2012

Outline: The project targets intelligent technologies that robustly support dynamic coalition formation, adaptation and resource allocation between heterogeneous autonomous vehicles, which have limited communication bandwidth, limited sensing, limited computing resources, and limited power supply. The developed radar device provides innovative solutions for the identification, localization, and tracking of dynamically changing targets in noisy environments.

Major characteristics of the system:

- **A Telos B mote for wireless transmission of I&Q signals to the base station.**
- **A Tyco K-band radar transceiver unit integrated with a custom design circuit board, for power management, signal conditioning, and modulation.**
- **The pocket radar operates on a 9V battery and comprises a fully autonomous system. Power consumption when active is 170mW.**
- **Detection to 6m has been demonstrated with the system, theoretical limit is >60m but may be limited by clutter and noise.**
- **Further sensors can be added (infrared, vibration, light detector, etc.,) that can be combined with the radar for a distributed multi-sensory monitoring function.**
- **Physical characteristics; the dimensions of the system are 4 x 1.5 x 2 inch and a weight of 350g.**



Future Plans Version (V0.4):

- **Smaller board (around 50%)**
- **Digital control of the modulation allows flexibility of transmitter characteristics**
- **Hardware sleep modes for lower power consumption**
- **Higher capacity power source (NiMH, Li-Ion or LiPc**

IP status: The technical solution is related to several patents existing and pending with AFRL and U of Memphis

CLION is a multidisciplinary research center that involves students and faculty from mathematics, electrical engineering, computer science, neuroscience, and biomedical engineering and faculty and researchers from more than 15 academic and government partners across the nation. *http://clion.memphis.edu*

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