

NASA SBIR/STTR Technologies

Proposal Title. - Reconfigurable L-band Radar Transceiver using Digital signal synthesis

Topic No. S1.02

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Firm Name –Intelligent Automation Inc., MD



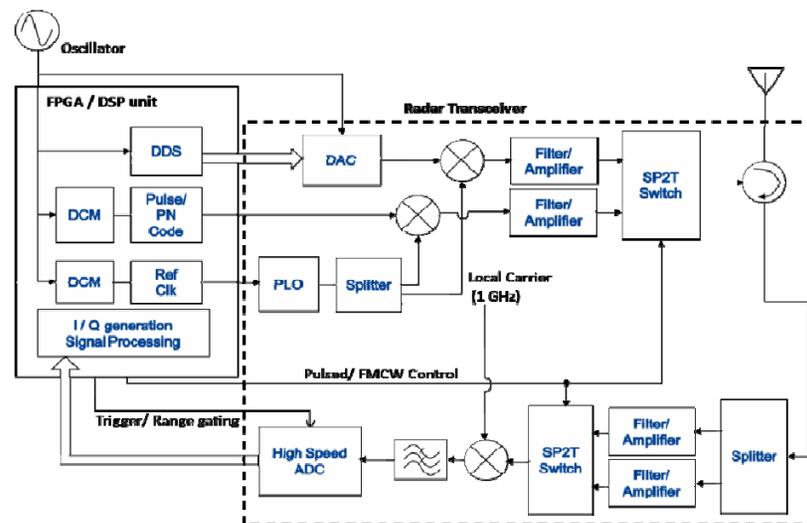
Identification and Significance of Innovation

Intelligent Automation, Inc. (IAI), proposes to develop a reconfigurable L-band radar transceiver module. The emphasis will be to implement most of critical radar functionalities like:

- Baseband modulation signals
- Orthogonal high frequency pseudo random codes for pulse compression
- Direct Digital synthesis (DDS) or numerically controlled oscillators (NCO) for generating RF carrier reference signal
- DDS driven Frequency sweep for FMCW (Frequency Modulated Continuous Wave) radar functionality
- Sigma-Delta technique for direct carrier synthesis
- Received signal processing to generate I/ Q components

on a single embedded platform. Such a platform is a combination of FPGA + DSP on one board. This innovation leverages work from several on-going SBIR efforts at IAI.

Expected TRL Range at the end of Contract (1-9): 6



Technical Objectives and Work Plan

- Define system requirements, literature survey
- Implement the key radar blocks in software using suitable FPGA logic.
- Integrate the analog front end, with the digital sections, and perform comprehensive testing of the transmitted signals, and received IF signals.
- Finish the Phase I, with a complete proof of concept demonstration, and lay down a concrete path for Phase II transition.

Tasks	Contract Months					
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

NASA and Non-NASA Applications

The most promising commercial applications are:

- Reconfigurable radar for commercial applications
- Digital waveform generation
- UAV based applications (due to the small form factor and low power). This would include UAV based weather surveillance, target tracking and other commonly sought after UAV radar applications

Firm Contacts

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NON-PROPRIETARY DATA