Title: System and Method for Efficient Doppler Ambiguity Resolution in Time Domain Multiplexing - Frequency Modulation Continuous Wave (TDM-FMCW) Radar

This invention presents a high resolution FMCW radar system with improved maximum measurable velocity. The patent first designs an efficient waveform scheduling scheme according to the TDM modulation method and then develops an efficient Doppler ambiguity resolution method by exploiting the inherent property of the waveform designed and taking advantage of array signal processing.

The main problem solved in this invention is the resolution of velocity ambiguity in TDM FMCW MIMO radar. We solve this problem by co-designing the waveform scheduling scheme and the efficient Doppler ambiguity resolution algorithm.

The difficulty lies in that given arbitrary array configuration and requirements on low computation load, one need to design the waveform scheduling and the signal processing method in the ambiguity resolution simultaneously.

The invention is intended for TDM FMCW MIMO radar used on automotive vehicles. It is possible to be applied to any TDM MIMO radar in other fields like airborne radar, spaceborne radar, sonar, and any kind of such active sensors in any applications.

Figures included with the drawings are

Figure-1: Radar system architecture

Figure-2: Transmitting and receiving antenna array

Figure-3: TDM transmitting scheme.

Figure-4: Overall processing flowchart

Figure-5: Doppler ambiguity resolution