Impairments Correction of Six-Port Based Millimeter-Wave Radar

Authors : Dan Ohev Zion, Alon Cohen

Abstract : In recent years, the presence of short-range millimeter-wave radar in civil application has increased significantly. Autonomous driving, security, 3D imaging and high data rate communication systems are a few examples. The next challenge is the integration inside small form-factor devices, such as smartphones (e.g. gesture recognition). The main challenge is implementation of a truly low-power, low-complexity high-resolution radar. The most popular approach is the Frequency Modulated Continuous Wave (FMCW) radar, with an analog multiplication front-end. In this paper, we present an approach for adaptive estimation and correction of impairments of such front-end, specifically implemented using the Six-Port Device (SPD) as the multiplier element. The proposed algorithm was simulated and implemented on a 60 GHz radar lab prototype.

Keywords : radar, FMCW Radar, IQ mismatch, six port
Conference Title : ICRST 2020 : International Conference on Radar Science and Technology
Conference Location : Amsterdam, Netherlands
Conference Dates : May 14-15, 2020