Resolution Improvement Strategies for Coherent Laser Radar

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Coherent laser radar or LADAR is a techniques that can be explored in several ways to provide high-resolution imagery. Among the techniques in question we have studied multi-aperture imaging using spatial heterodyne methods to recover the phase information. Subsequent image sharpening algorithms are applied to recover an image with effective aperture diameter larger than the smaller sub-apertures. We also examined a temporal processing technique that we call sparse-frequency linear frequency modulation LADAR which applies matched filter processing with multiple frequency bands to improve range resolution. This talk will cover our experimental and simulation results for these two techniques and review other aspects of creating high resolution imagery that we have contemplated in our labs.

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