Phased Array Radar: AI Assisted Tracking Filter Solution Displayed With VR Visualization

Zhuo, Man Fung (School: Kalani High School)

Creation of a compact radar system enhanced with AI-assisted ESRGAN imaging is proposed for advanced target detection and high-resolution situational awareness. The system integrates a phased-array radar with an ESRGAN module that refines low-resolution radar images, thus enabling precise target identification even in challenging operational environments. The prototype's performance is validated through numerical simulations and experimental measurements, which confirm a strong correlation between predicted and observed outcomes. The presented work demonstrates that embedding AI-driven image enhancement techniques within radar systems offers a cost-effective and scalable solution to significantly improve imaging fidelity and detection accuracy.

Awards Won: