



TRACK 3: 4TH INDUSTRIAL REVOLUTION

“CLUTTER-COMPENSATING ADAPTIVE WAVEFORMS WITH COGNITIVE RADAR USING ACTUAL TARGET MEASUREMENTS FOR TARGET CLASSIFICATION”

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ABSTRACT

In this work, we investigate the target classification performance of a cognitive radar (CRr) using EM-simulated ground-based target responses and EM-measured aerial target responses in the presence of transmit waveform-dependent clutter. Moreover, we consider a more realistic target classification scenario where the cognitive radar is pointing at a look angle of 30 degree, in which clutter can definitely be a major interference. Previous works included EM-simulated target responses with adaptive waveform design technique known as probability-weighted energy (PWE) for target recognition; however, practically measured power spectrum density (PSD) for signal-dependent clutter was not considered. Therefore, it is essential to build on prior works by considering signal dependent clutter using measured target responses and practical clutter model. We design clutter-compensating adaptive waveforms for CRr to improve classification in the presence of both narrowband and wideband clutter. Our results show improvement in classification performance of clutter-mitigating SNR and MI-based waveforms used in conjunction with PWE.

BIOGRAPHY OF SPEAKER

- Joined Air Force as an AOSS in 2001 (Under Joint Polytechnic Scheme)
- Joined as Air Force Engineer in 2010.
- Previous role: OIC in 110 SQN and OC CNEF in 815 SQN
- Bachelor in Electronics Engineering with 1st Class Honours in 2009 – NUS
- Master of Defence Technology and Systems (MDTS) 2018 – NUS / TDSI.
- Master of Science in Electrical Engineering in 2019 – Naval Postgraduate School
- EW Engineer and Digital Communicate certificates in 2019 – Naval Postgraduate School
- Presented this work at the European Radar Conference in October 2019.
- Currently working as a Staff Officer in the Air Plans Department.

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