MASTER OF SCIENCE
IN
SYSTEMS ENGINEERING

RESOLVING FREQUENCY AMBIGUITIES IN STEP FREQUENCY WIDEBAND COMPRESSIVE RECEIVERS

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Present compressive receiver implementations are limited due to their analog implementation and the necessity for digital processing of the serial output data. Previous research has shown that a stepped-frequency digital design using sub-Nyquist sampling mitigates many of the limitations. An algorithm that implements the Chinese Remainder Theorem to solve the frequency ambiguities that occur in the design due to sub-Nyquist sampling with high resolutions is investigated. Different resolutions, a different number of sampling frequencies, and sampling frequency pairs and triples with various differences are simulated for one to five signals that overlap in the time domain. Predictions for the best achievable resolution, the minimum number of sampling frequencies needed, and the difference required between the sampling frequencies are made according to the comparison of simulation results.

DoD KEY TECHNOLOGY AREAS: Electronics, Electronic Warfare

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