

[13] Extracting tones which vary in frequency from non Gaussian noise

The project will address the UDRC challenge: "To distinguish between man-made echosounding pulses and those made by marine mammals (cetaceans)"

Ever since the early days of passive sonar (receive only) there has been a need to determine whether sounds in the ocean emanate from the native marine life or from mechanical sources which may turn out to be contacts of interest. Furthermore as modern Navies aspire to be ever more responsible environmental custodians of the underwater environment, it is necessary to have a situational awareness of local biological activity before any active sonar (transmit and receive) transmission. The idea is to develop frequency tracking schemes tailored to the underwater environment with specific regard to the tracking of cetacean tonal vocalisations. The approach will be block based and take advantage of the fractional Fourier transform to feed the particle filter with estimates of both centre frequency and chirp-rate. The Matlab based algorithms will be benchmarked against real datasets and the current best of breed.

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