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# Biosonar model for obtaining fine target structure in complex targets

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Bats use echolocation to discriminate targets with multiple glints in which the glints are much closer together in time than the integration time of the bat auditory system. This indicates the bats cannot be using purely time-domain processing to image the target. It is likely that the bats exploit cues such as spectral peaks and notches due to the interference between the glints at specific frequencies. However, these interference patterns quickly grow complicated as the number of glints increases. The cepstrum is a signal processing algorithm designed to identify these interference intervals. We previously demonstrated that simple two-glint targets can be accurately resolved using a time-varying version of the cepstrum, or cepstrogram. This talk will present an algorithm for interpreting the evolution of cepstral peaks across a target with many glints to estimate the inter-glint intervals. This algorithm has the desirable quality of processing the data causally as it is received, and thus is possible to implement in real time. The performance of the algorithm will be evaluated using experimental data from an ultrasonic bat simulator. [Work supported by US Office of Naval Research]