27. Measuring signals and noise

Mark Johnson, Woods Hole Oceanographic Institution, MA, USA

Our usual task in signal analysis is to estimate the value of a parameter that is indirectly measured by the available sensors. For example, information about the angle-of-arrival of a sound is buried in the signals recorded from stereo microphones. While it may be clear how to process the signals in order to measure the desired parameter, it is often less obvious what is the accuracy or quality of the measurement. Quality can be measured in a number of ways (familiar ones are the standard deviation, signal-to-noise ratio and confidence intervals) but is an essential component of any measurement. Not only does a quality metric allow other researchers to use and compare your results, it also indicates the sensitivity or robustness of your measurement to the measurement conditions: the ambient noise, sensor noise, and the geometric arrangement of sensors. By considering quality right at the outset, you can often design an experiment that minimizes sensitivity to limitations of the sensors and so maximizes your chances of success. We will discuss how to choose quality metrics and some tricks that can be used to determine and improve the quality of measurements. The Monte Carlo method will be introduced as a generally-applicable tool for estimating quality.

28. Investigations using the Auditory Brainstem Response in porpoises

Kristian Beedholm, Kerteminde, SDU, Denmark

The recording of sound elicited brainstem activity from odontocetes has become a major tool in recent years for doing research into the auditory system of a group of animals that for ethical reasons are otherwise difficult to investigate electrophysiologically. Here I will show some of the methods we have been using in Kerteminde to probe into the hearing of harbor porpoises and demonstrate some of the findings so far.

Saturday Evening:

Field studies of white beaked dolphins: hearing, acoustic communication, and tracking

Lee Miller, Biology, SDU, Denmark

"Hot" new results and pictures from a field study in Iceland in July-August 2006