

3. Analog and digital signals

Bent Bach Andersen, Biology, SDU, Odense, Denmark

(Sunday, August 20. 11:00 – 12:00 Location: Biology, SDU, Søgaard, Johnstad-Møller auditorium)

Examples of the practical problems by converting analog to digital signals, illustrated by using a step by step presentation of the elements necessary for correct A/D conversion

4. Basic signal analysis

Mark Johnson, Woods Hole Oceanographic Institution, MA, USA

You have just tagged a new species and have recovered the data from the tag. It contains thousands of measurements from a sensor of type X. Now what? To answer this question, we will take an engineering approach to introduce the basics of time series analysis. We will review the three fundamental types of signals: periodic, impulsive, and noise, describing their characteristics in the time and frequency domains. Combining these signals with filters, it is possible to describe almost any signal. However, the signals that occur in nature are usually so complicated and time-varying that models or block diagrams that summarize the different components in the signal are a helpful aid. We often want to identify and extract features from these compound signals. Windowing (or equivalently, filtering) in the time and frequency domains is the main tool used to achieve this. We will introduce the duality between time/frequency and windowing/filtering and discuss how this leads to important constraints in the way signals can be processed.