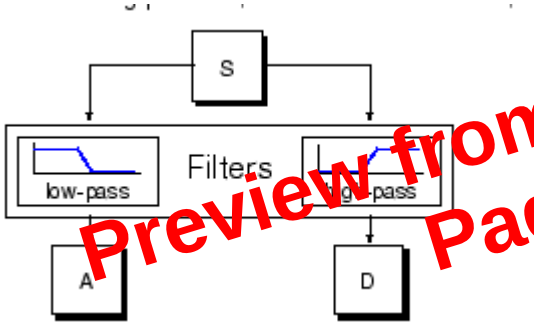
Low scale a ⇒ Compressed wavelet ⇒ Rapidly changing details ⇒ High frequency ω.

High scale a ⇒ Stretched wavelet ⇒ Slowly changing, coarse features ⇒ Low frequency ω.

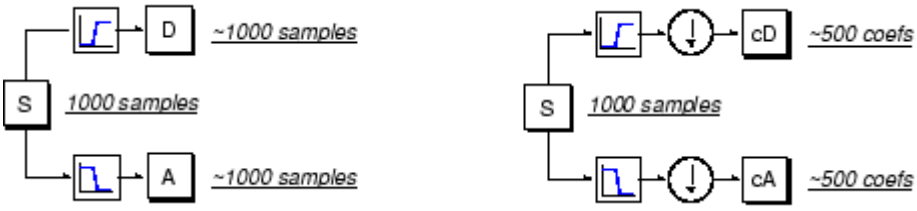
For many signals, the low-frequency content is the most important part. It is what gives the signal its identity. The high-frequency content, on the other hand, imparts flavor or nuance.

In wavelet analysis, we often speak of approximations and details. The approximations are the high-scale, low-frequency components of the signal. The details are the low-scale, high-frequency components.

The filtering process, at its most basic level, looks like this.



The original signal, S, passes through two complementary filters and emerges as two signals. he original signal S consists of 1000 samples of data. Then the resulting signals will each have 1000 samples, for a total of 2000. By looking carefully at the computation, we may keep only one point out of two in each of the two 2000-length samples to get the complete information. This is the notion of downsampling. We produce two sequences called cA and cD.



The process on the right, which includes downsampling, produces DWT coefficients.

Here is schematic diagram with real signals inserted into it.