Digital processing of analog signals naturally requires a representation of continuous-time signals as a discrete-time sequence. The most common representation of this type is based on the Shannon-Nyquist sampling theorem which provides an exact representation for bandlimited signals sampled at a sufficiently high rate but leads to aliasing error when the signal is under sampled. In this talk a number of other approaches are discussed to obtaining discrete-time representations that avoid or mitigate the effects of aliasing. These include other basis expansions such as bilinear sampling and wavelets, and modified sampling strategies such as non-uniform sampling and randomized sampling. The use of randomization in filter and array implementation and its relation to randomized sampling will also be discussed.

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