

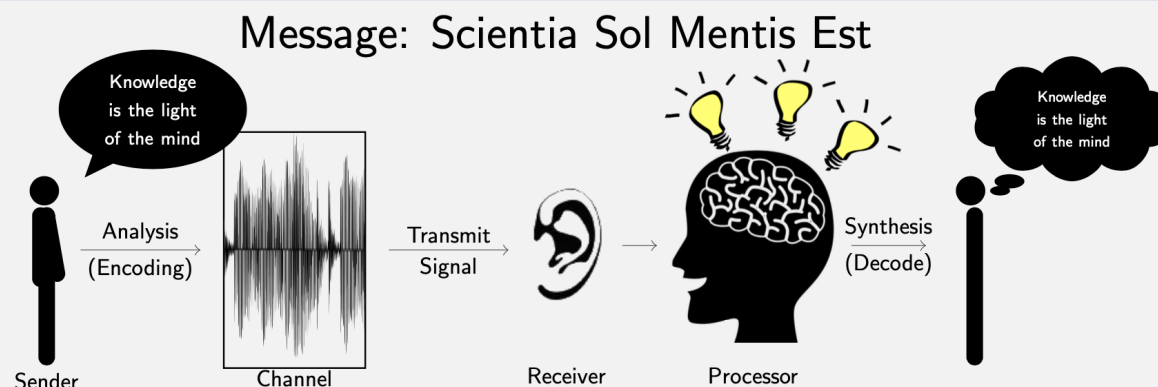
DISCRETE FRAMES FOR HIGH-DIMENSIONAL DATA

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In the early 1950s, Duffin and Schaeffer introduced the concept of discrete frames for a Hilbert space. I will introduce discrete frames in two distinct settings: infinite sets for function spaces and finite sets for graph signals (functions defined on the vertex set of a graph).

I will discuss two settings where constructions of discrete frames are of interest to the signal processing community. First, I will discuss a systematic approach for producing frames for high-dimensional Euclidean domain data by discretizing continuous wavelet transforms, which are produced using square integrable representations of certain locally compact groups. Second, I will discuss discrete frame constructions used to generalize tools from Fourier analysis to the setting of signals defined on graphs. I will present some of my results in both areas as well as describing how both problems present work amenable to undergraduate research projects.

Example (Signal Lifecycle)



My Research: Design "good" dictionaries to represent information.