Abstract: From the sounds of crunching leaves to the camera feed of humans fleeing from their AI overlords, digital systems have been employed to record and analyze all kinds of data. The need to be able to process data in an efficient manner spurred the development of digital signal processing (DSP) as a discipline. A signal is any data that varies with respect to time or space. DSP employs a variety of mathematical techniques to analyze signals and extract useful information from them, by filtering out noise, augmenting noteworthy features and other manipulations. In this talk we study a particular class of signal filters, called linear-time invariant systems that admit an elegant description and are employed in a wide variety of settings.

There are no formal prerequisites for the talk, but comfort with linear algebra and complex numbers will make the discussion much more interesting.