Signal Processing has traditionally dealt with time series, images, video where data is indexed by time ticks and pixels. The structure of the indexing set is taken for granted. In the last few years, new opportunities for signal and data processing have arisen, except data is now indexed by social agents, genes, customers of service providers, or by some other arbitrary enumeration suggested by the application. The tutorial will present *Graph Signal Processing* by revisiting the fundamentals of Signal Processing, developing for data (signals) arising from these various domains the essential concepts and methods of traditional Signal Processing—signal model, shift, filtering, convolution, spectral analysis, Fourier transform, filter frequency response, among others. We illustrate the concepts with datasets drawn from physical to social networks and applications from improving deep learning to uncovering graphs capturing dependencies among data.

Work with Aliaksei Sandryhaila, Joya Deri, and Jonathan Mei.

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