

Title: Current Methods in Graph Signal Processing

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Description: Traditional signal processing methods were developed for signals represented by regular mathematical structures such as functions and vectors in one or more dimensions. In many practical problems, the measured signals can be conveniently represented by irregular mathematical structures where the data are mapped onto these structures as attributes. This creates many new opportunities how such signals can be represented, transformed and otherwise processed. In the past decade, the researchers tried to adapt traditional signal processing methods to discrete mathematical structures such as graphs. This talk will survey the methods which have been proposed in the literature for processing graph-like signals, and point out some of their limitations. The main aim is to offer understanding and give a brief overview of the existing methods using the combination of high level description of algorithms, low-level mathematical models and numerical examples. Some suggestions about perspective research directions will also be outlined.

Learning outcomes:

- Understanding of graph signal representations and processing methods.
- Understand developments in this area over the past decade.

Tutorial structure:

1. Fundamental problems defined on graphs
2. Graph signal representations in different domains
3. Random processes on graphs
4. Learning on graphs
5. Adopting traditional methods for graph signals

Duration:

- estimated duration is 2 one hour time slots

Audience:

- graduate students and researchers with interest in statistical signal and data processing