



Advanced Digital Signal Processing

6th March 2017 to 10th March 2017

Overview:

Digital signal processing (DSP) is the study of signals in a digital representation and the processing methods of these signals. A common goal of the engineering field of signal processing is to reconstruct a signal from a series of sampling measurements. In general, this task is impossible because there is no way to reconstruct a signal during the times that the signal is not measured. Nevertheless, with prior knowledge or assumptions about the signal, it turns out to be possible to perfectly reconstruct a signal from a series of measurements. Over time, engineers have improved their understanding of which assumptions are practical and how they can be generalized. An early breakthrough in signal processing was the Nyquist–Shannon sampling theorem. The main idea is that with prior knowledge about constraints on the signal’s frequencies, fewer samples are needed to reconstruct the signal. Compressed sensing (also known as compressive sensing, compressive sampling, or sparse sampling) is a signal processing technique for efficiently acquiring and reconstructing a signal, by finding solutions to underdetermined linear systems. This is based on the principle that, through optimization, the sparsity of a signal can be exploited to recover it from far fewer samples than required by the Shannon-Nyquist sampling theorem.

This course will cover some fundamentals of DSP, sampling and reconstruction, Transforms and their use, Compressive Sensing and Sparse Signals, Synthetic Aperture Radar (SAR) Signal Processing and Applications of Compressive Sensing. Apart from this, the course will cover current research, applications, further directions and useful resources.

Objectives:

- To provide an understanding of the principles and concepts digital signal processing.
- To introduce compressive sensing and its application to automatic target recognition.
- To provide an understanding of current research in advanced digital signal processing.

Course	6 th March 2017 to 10 th March 2017
Host Institute	National Institute of Technology, Rourkela
Maximum Number of Participants	50
You Should Attend If...	<ul style="list-style-type: none"> • you are a Signal Processing/Communication engineer or research scientist interested in development and application of Advanced Digital Signal Processing. • you are a researcher in the field of Signal Processing.. • you are a student or faculty from academic institution interested in learning/ take up research in the field of Signal Processing.
Fees	<p>The participation fees for taking the course is as follows: Participants from abroad : US \$300 Industry/ Research Organizations: Rs. 6000/- Academic Institutions: Rs. 3000/- Students: Rs. 1500/-</p> <p>The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges. The participants will be provided with accommodation on payment basis.</p>

The Faculty



Prof. John J. Soraghan received the B.Eng. (Hons.) and M.Eng.Sc. Degrees in electronic engineering from University College Dublin, Dublin, Ireland, in 1978 and 1983, respectively, and the Ph.D. degree in electronic engineering from the University of Southampton, Southampton, U.K., in 1989. His doctoral research focused on synthetic aperture radar processing on the distributed array processor. He currently holds the Texas Instruments Chair in Signal Processing with the University of Strathclyde. He was a Manager of the Scottish Transputer Centre from 1988 to 1991 and a Manager of the DTI Parallel Signal Processing Centre from 1991 to 1995. His main research interests are signal processing theories, algorithms, and architectures with applications to remote sensing, telecommunications, biomedicine, and condition monitoring.



Prof. Ajit Kumar Sahoo, is an assistant professor at National institute of Technology, Rourkela since 2007. His research interest include Radar Signal Processing, Soft Computing, wireless sensor networks.



Prof Sarat Kumar Patra, is a Professor at National institute of Technology, Rourkela since 2006. He obtained his PhD degree from University of Edinburgh, UK in 1998. His research interests include wireless and mobile communication, optical communication, cognitive radio, fuzzy systems

Course Coordinators

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