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Computer Engineering

EEE 471 Assignment

Self-processing is an electrical engineering subfield that focuses on analyzing, modifying, synthesizing signals such as sound, image, and scientific measurements.

Signal processing techniques can be used to improve transmission, storage, efficiency and subjective quality and to also emphasize or detect components of interest in a measured signal.

Signal processing and interfacing work together to produce more precise and accurate results and improve the quality of outputs.

- Statistical signal processing: This is an approach which treats signals as stochastic process, utilizing their statistical properties to perform signal processing tasks.

Statistical techniques are widely used in signal processing applications. For example one can model the probability distribution based on noise incurred when photographing an image, and construct techniques based on this model to reduce the noise in the resulting image

- Digital signal processing: This is the processing of digitized discrete time sampled signals. Processing is done by general purpose computers or by digital circuits such as ASICs, field programmable gate arrays or specialized digital signal processors (DSP chips). Examples of algorithms are the tasks Fourier transform [FFT], finite impulse response (FIR) filter, infinite impulse response (IIR) filter and adaptive filters such as the Wiener and Kalman filter.
- Nonlinear signal processing: This involves the analysis and processing of signals produced from non-linear system and can be in the time frequency. Or spatiotemporal domain. Non linear system can produce highly complex behavior including bifurcation, chaos, harmonics and sub harmonics which cannot be produced or analyzing using methods.
- Discrete – time signal processing: This is for sampled defined only at discrete point in time, and as such are quantized in time, but not in magnitude Analog discrete time

signal processing is a technology based on electronic devices such as sample and hold circuits, analog time-division multiplexers, analog delay lines and analog feedback shift registers. This technology was a predecessor of digital signal processing and is still used in advanced processing of gigahertz signals.

- Continuous time signal Processing: This is for signals that with the change of continuous domain (Without considering some individual interrupted points). The methods of signals processing include time domain, frequency domain and complex frequency domain.

EXPERT SYSTEM INSTRUMENTATION:

This is the term that refers to systems capable of mimicking human like decision making this leading to the term AI (Artificial Intelligence). This architecture of an expert system is an example of a knowledge based system.

Experts systems were the first commercial system to use knowledge based architecture.

A knowledge-based system is essentially composed of two sub-systems:

- The knowledge base; and
- The inference Engine

In the field of artificial intelligence inference engine is a component of the system that applies logical rules to the knowledge base to deduce new information while knowledge base (KB) is a technology used to store complex structured and instructed information used by a computer system.