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ELE/ECE

EEE 471

Signal processing & Interfacing techniques in measuring Instruments.

Signal processing is an electrical engineering subfield that focuses on the analysing, modifying and synthesising signals such as sound, image & scientific measurements. It is concerned with improving the quality of the reading or signal at the output of a measurement system and one particular aim is to attenuate any noise in the measurement signal that has not been eliminated by careful design of the measurement system.

Signal Interfacing is the process of connecting or linking together devices, allowing us to design or adapt the output & input configurations of the two electronic devices so they can work together.

The techniques are:-

- Discrete time.
- Continuous time.
- Statistical
- Digital
- Analog
- Non-linear

Digital

Digital system processing of digitized discrete-time sampled signals. processing is done by general-purpose computers or by digital circuit such as ASICs, field-programmable gate arrays or specialised digital signal processors (DSP chips). Typical arithmetic operations include fixed point and floating point, real valued and complex values, multiplication and addition.

Analogy is a technique used for signal that have not been digitized. This involves linear & non linear electronic circuits.

Statistical This is a technique which treats signal as stochastic processes, utilizing their statistical properties to perform signal processing tasks.

Non-linear

This is a technique that involves the analysis & processing of signals produced from non-linear systems & can be in time frequency or spatiotemporal domains.

Discrete time

is a technique for sampled signal defined only at discrete points in time, & is such as quantized in time but not in magnitude.

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Expert System Instrumentation

The expert system instrumentation are these system like artificial intelligence which slow / emulate the decision making ability of human expert.

Component / Architecture of expert system

- i) Knowledge Base
- ii) Inference engine
- iii) Knowledge acquisition & learning module
- iv) user interface
- v) Explanatory module