

Tiwari Eneborg 2120  
18/Eng 04/080  
Electrical / Electronics Engineering  
EPE 471

Assignment

①

Signal Processing & interfacing techniques to necessary instruments.

Signal Processing is an electrical engineering skill field that focuses on analysing, modifying & generating signals such as sound, images & scientific measurements. It's techniques can be used to improve transmission, storage efficiency & subjective quality & also to emphasize or detect components of interest in a measured signal.

Signal interfacing is the method 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.

These techniques are concerned with improving the quality of the readings or signals at the output of a measuring instruments. They are used to improve transmission, storage efficiency & subjective quality, as well as to emphasize or detect components.

Some of these techniques are;

- Discrete time, - Continuous time, - Statistical.  
- Analog, - Digital, - Nonlinear, etc.

- Discrete time: IS a technique, for sampled signals also defined only at discrete points in time; as such are quantized in time but not in magnitude. The concept for this also refers to a theoretical discipline that establishes a mathematical basis for DSP [Digital Signal Processing] without taking quantization error into consideration.

- Continuous time: IS a technique, for sampled signals that vary with the change of continuous domain. This includes; time domain, frequency domain, complex frequency domain.

- Statistical: IS a technique which treats signals as stochastic process, utilizing their statistical properties to perform signal processing tasks.

- Analog: IS a technique used for signals that have not been digitized. This involves linear & nonlinear electronic circuits.

- Digital: IS a technique, used in the processing of digitized discrete-time sampled signals, done by general purpose computers or by digital circuits.

- Non-Linear: It's a technique which involves the analysis & processing of signals produced from non-linear systems & can be in time, frequency or spatio-temporal domains.

- Linear, analyses linear system signals or signals analysis using linear methods.

(2)

### Expert System Instrumentation.

The Expert System instrumentation are those systems like artificial intelligence, which shows / emulate the decision making ability of a human expert.

The ESI, is the act of using or adapting an AI or a series or combination of AIS, developed to solve complex problems in a particular domain.

The instrumentation, consists of its software, hardware engine & all systems that work together for its function.

#### - Components / Architecture of ES.

- i) Knowledge Base.
- ii) Inference engine.
- iii) Knowledge acquisition & learning module.
- iv) User interface.
- v) Explanation module.

ES, uses the Forward Chaining [ "What can happen next?" ] & backward Chaining [ "Why did this happen?" ] to recommend solutions.