UGWUJA OGBONNA 17ENG04/072 ElectElect
EEE 471

1) Signal processing condenses measurements to extract information about some distant state of nature. Signal Processig can be described from different perspectives. To an acoustician, it is a tool to turn measured signals into useful information. To a sonar designer, it is one part of a sonar system. To an electrical Engineer, it is often restricted to digitization, sampling, filtering and spectral estimation. A modern underwater acoustic signal processing system can include the following

- Digitization (Sampling in time and quantizing in amplitude)
- bandpass and base band filtering
- Beamforming (spatial filtering)
- Matched filtering and/or incoherent integration.
- Detection, classification, localization and tracking

Although measurements are typically acquired jointly in space and time, signal processing is usually partitioned to combine signals across space first and then time. The other components are similarly seperable, in part owing to their inherent modularity and also from a paced evolution in computational power. For example, early deployment of beamformers required ~~Sen~~ special hardware so only beam-output data were easily accessible for analysis. Easy access to data enables advances in the morden signal processig components of detection, classification, localization and tracking.

2) In artificial intelligence, an expert system is a computer system emulating the decision making ability of a human expert. An expert system

generally consists of four components which are a knowledge base, the search or inference system, a knowledge aquisition system, and the user ~~Int~~ interface or communication system.

Expert systems are designed to solve complex problems by reasoning through bodies of knowledge represented mainly as "if-then" rules rather than through conventional procedural code.

We can also divide the expert system into two subsystems: the ~~interface~~ inference engine and the knowledge base. The knowledge base represents facts and rules. The ~~interface~~ inference engine applies the rules to the known facts to deduce new facts. ~~Interf~~ inference engines can also include explanation and ~~ed~~ debugging abilities.