

I begin with two quotes: "*Make everything as simple as possible, but not simpler*" (Albert Einstein) and "*Nature is pleased with simplicity. And nature is no dummy*" (Isaac Newton). These quotes were not written for designing application systems from data. But they suggest a very useful principle of designing systems from data: when we design a system we should not use beyond what is needed to solve the problem. We should use "adequate" inputs (information) and should not have unnecessary degrees of freedom in the system. We note that we are not suggesting the use of "minimum" inputs - the word "adequate" has been used to address a practical problem. If a system uses just the minimum required information (or features), it may not be able to stand any measurement error and hence a controlled level of redundancy should be kept. In this talk, I shall discuss how a very general framework can be used to design parsimonious decision making systems using Neural Networks and Neuro-fuzzy Systems. I shall also discuss how this approach can be extended to control the level of redundancy in the set of features used as well as to solve a more general problem, called sensor selection, where a sensor is responsible for a group of features.