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PROCESS MODELS OF EXPERTISE FOR DECISION MAKING

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Information processing models of expertise in problem solving and decision making are not new. Indeed, one of the major results of the study of complex tasks over the past twenty years is that expertise consists of large amounts of task/domain-specific knowledge, arguably in the form of patterns or rules (the 50,000 patterns hypothesis).

In this tutorial, an alternative that arises in environments where there is little or no opportunity for large numbers of patterns to develop will be presented. Two examples will be considered. The first example is the problem of fraud detection in auditing, where the base rate of occurrence of the phenomenon is low and most auditors have little or no direct experience. Despite this lack of experience, there are auditors who are quite successful in detecting frauds in simulated versions of real fraud cases.

The second example is the diagnosis of faults in a manufacturing line in semi-conductor (VLSI) fabrication. In this setting, there is also limited opportunity for patterns to develop, due to the problem of obsolete knowledge caused by the rapid changes in device and process designs. Once again, however, there are typically a small number of individuals who are successful in performing this task.

The question we shall consider in this tutorial is how to explain success under these circumstances.