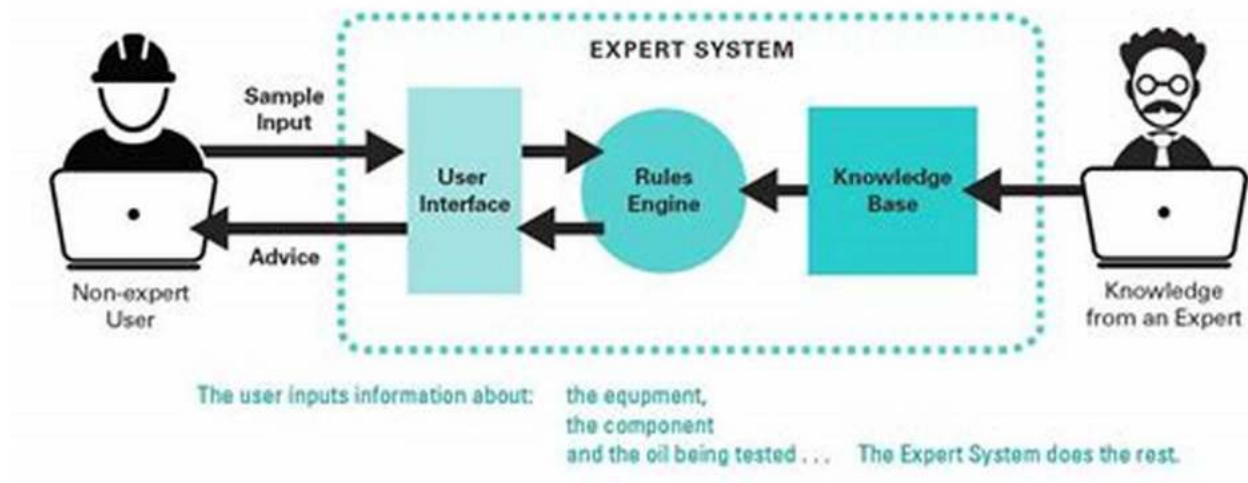


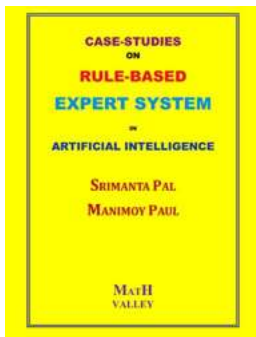
Case Studies on Rule-Based Expert System in Artificial Intelligence



Artificial Intelligence (AI) has made significant advances over the years, and one of its subfields, Expert Systems, has proven to be a valuable tool in various industries. Rule-Based Expert Systems, in particular, have gained traction in solving complex problems by emulating the decision-making process of human experts. In this article, we will delve into several intriguing case studies that demonstrate the effectiveness and versatility of Rule-Based Expert Systems in the realm of AI.

1. Medical Diagnosis

When it comes to diagnosing complex medical conditions, Rule-Based Expert Systems have proven to be valuable assets. By incorporating numerous rules based on medical knowledge, these systems can analyze patient symptoms, medical history, and other relevant factors to provide accurate diagnoses and potential treatment options.



CASE-STUDIES ON RULE-BASED EXPERT SYSTEM IN ARTIFICIAL INTELLIGENCE

by Mark Young ([Print Replica] Kindle Edition)

★★★★★ 5 out of 5

Language : English

File size : 7650 KB

Screen Reader: Supported

Print length : 35 pages



For example, the Mayo Clinic implemented an Expert System to diagnose rare diseases that are challenging even for experienced clinicians. The system utilizes a vast knowledge base and a set of predefined rules that consider symptoms, genetic factors, and patient demographics. This automated approach has significantly enhanced the accuracy and efficiency of the diagnostic process, leading to better patient outcomes.

2. Industrial Quality Control

In the manufacturing industry, ensuring product quality is crucial. Expert Systems have been employed to perform real-time quality control, reducing the dependence on human inspection and minimizing the risk of human errors.

For instance, a leading automobile manufacturer integrated a Rule-Based Expert System into its production line to detect defects in painted car bodies. Through a combination of image recognition algorithms and predefined rules, the system can identify imperfections such as scratches or color abnormalities. By automatically flagging defective components, the manufacturer can rectify issues promptly, preventing faulty products from reaching the market.

3. Financial Fraud Detection

Financial institutions face constant threats from fraudulent activities. Rule-Based Expert Systems have played a vital role in detecting and preventing various types of fraud, such as credit card fraud and identity theft.

A prominent credit card company implemented an Expert System to analyze customer transactions in real-time. By applying a set of rules based on historical fraud patterns and suspicious activity indicators, the system can identify potentially fraudulent transactions. This proactive approach has significantly reduced false positives and provided a more accurate detection mechanism, protecting both the company and its customers from financial losses.

4. Customer Support

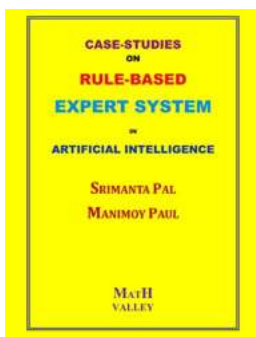
Providing efficient and knowledgeable customer support is crucial for businesses across industries. Expert Systems have been employed to assist customer support representatives in resolving customer queries and issues.

A global telecommunications company utilizes an Expert System to aid its support team in addressing complex network-related inquiries. The system incorporates an extensive knowledge base that includes troubleshooting steps, network configurations, and common issues. By following the rules embedded within the system, support representatives can effectively diagnose and troubleshoot customer problems, leading to quicker resolution times and improved customer satisfaction.

The case studies discussed in this article emphasize the significance of Rule-Based Expert Systems in various domains. From medical diagnosis to quality control, fraud detection, and customer support, these systems have

demonstrated their potential in enhancing decision-making processes and improving overall outcomes.

As artificial intelligence and machine learning technologies continue to advance, we can expect further refinements and applications of Rule-Based Expert Systems. Their ability to incorporate vast amounts of knowledge and make complex decisions based on predefined rules makes them invaluable tools in today's data-driven world.



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This is a reference book on Artificial Intelligence (AI) and Expert Systems (ES) for the beginners in the field of business, science and technology and various other disciplines like law, medicine, etc. In this connection, we have considered some fundamental theoretical concepts on AI and ES. So a reader can understand the mechanism of the working principle of an expert system.

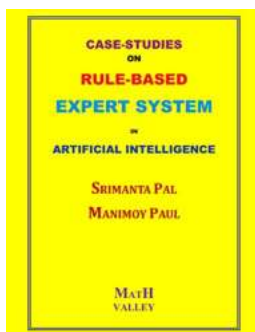
Coverage: This book is divided into 2 parts: (1) Theory and (2) Case-Studies. In the theory part, some basic concepts on Artificial Intelligence and Expert System are discussed. This part includes three chapters. On the other hand, the second

part of the book is discussing 11 case-studies in areas like business, law, medical, bio-science, agriculture, and various engineering applications.

Contents: An overview of AI is discussed in Chapter 1. Chapter 2 highlights the scope of the expert system. Chapter 3 deals with the working principle of an inference engine in an expert system shell. These three chapters are included in Part I i.e., theory of the book.

Part II of this book includes 11 case-studies on various fields

- Laws (Case 1: Contract Act, Case 2: Foreign Exchange Regulation Act (FERA)), Business (Case 3: Car Purchase), Taxonomy of Bio-Science (Case 4: Snake Identification, Case 5: Identification of Aquatic Weeds), Agriculture (Case 6: Agricultural Cropping Pattern), Medical Science (Case 7: A Doctor Without a Stethoscope), Mechanical/ Automobile Engineering (Case 8: Diagnosis of Automotive Problems), Electronics/ Electrical Engineering (Case 9: Fault Diagnosis in A Class B Amplifier with NAB Tape Equalisation), Computer Science and Engineering (Case 10: Computer Selection, Case 11: Troubleshooting of a Personal Computer).



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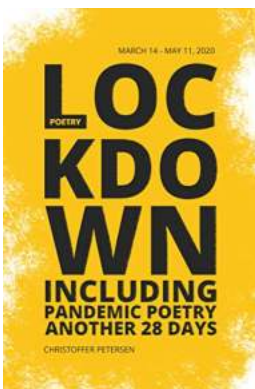
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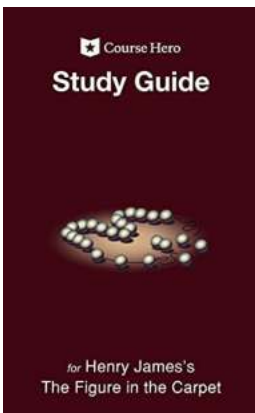
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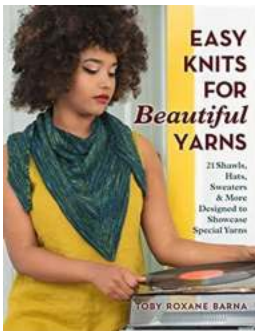
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