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Substation Control in Artificial Intelligence

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ABSTRACT

Aiming at the problem of the large number of devices and no backup in the intelligent substation monitoring system with the measurement and control devices configured at intervals, a new system architecture of the intelligent substation monitoring system is proposed. The article adopts the method of intelligent control to realize the accurate triggering of the data signal in the test process. The test system automatically captures and parses MMS messages and generates test reports to achieve the optimization of data processing closed-loop testing.

I. Introduction

Since the early to mid 1980's much of the effort in power systems analysis has turned away from the methodology of formal mathematical modelling which came from the fields of operations research, control theory and numerical analysis to the less rigorous techniques of artificial intelligence (AI). Today the main AI techniques found in power systems applications are those utilising the logic and knowledge representations of expert systems, fuzzy systems, artificial neural networks (ANN) and, more recently, evolutionary computing. These techniques will be outlined in this chapter and the power system applications indicated.

II. Technical Details of The Paper

Structure and Definitions One form of a knowledge-based system is an Expert System. There is no standard definition of an Expert System, but one which captures the spirit of this approach to problem solving, "An expert system captures the knowledge of a human expert in a narrow specified domain in a machine implementable form. It utilises this (knowledge) to provide decision support at a level comparable to the human expert and is capable of justifying its reasoning. It separates the inference mechanisms from the domain specific knowledge and uses one or more knowledge structures such as production rules, frames, combinations of frames and rules, semantic nets, and objects to represent this knowledge'' This separation of parts is illustrated in Fig.1 where the domain knowledge is shown to be explicit and separate from the other knowledge in the program.

III. Working

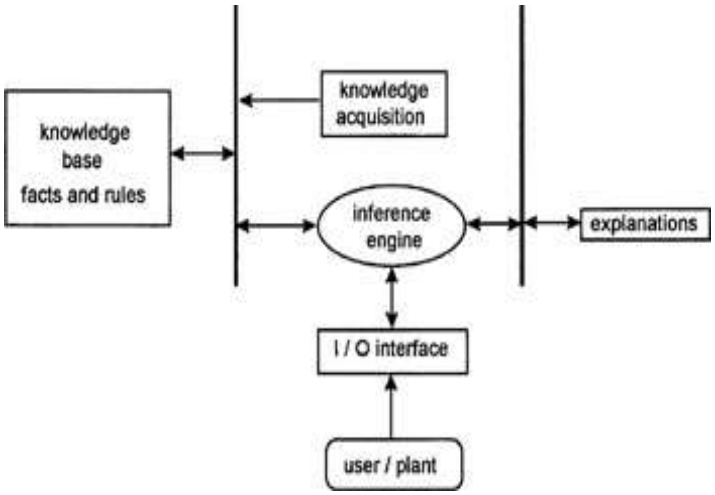

Figure1: Expert System Structure

The controller operation will be dole out in two ways. Following the everyday way the controllers run, it may be placed operative with a completed rule base, totally replacing the human operator. Nevertheless, it will be started with an empty or incomplete rule base, which suggests that it'll activate a learning mechanism. This way, the controller will complete step by step the operation rules and at the identical time will replace the human operator. If of these possibilities are tried and also the voltage continues being low, then operator outputs are processed. To avoid interference with this response, the execution of controller outputs is postponed every time for one sampling interval, provided the inference within the next sampling time yields the requirement of status changes. just in case the system cannot find a satisfactory solution because no rule can be fired, the system sends an alarm to the operator. He will have it slow to make your mind up what action to require using the switch components on the PC screen.

Iv. Applications

Distribution of electric power system automation and manual control devices such as circuit breakers, relays, disconnecting switch and so on. These relatively simple local individuals element control complex and together constitute a whole power system real-time control that is discrete control and continuous control like Discrete control, continuous excitation, fuzzy logic protection, fault diagnosis, load forecasting, energy efficiency, decision making.

V. Advantages

- Speeding up response time
- It can be avoiding operation mistakes
- Gradually replacing a human operator.
- It is permanent and consistent
- It can be easily documented
- It can be easily transferred or reproduced
- It will be in digital assistance to interact with users
- It facilitates decision making by making the process faster and smarter
- It doesn’t have any biased views,which ensures more accurate decision making

VI. Conclusion

If an opinion can be stated in conclusion it is that the strength and range of rule based expert system applications is fairly well established. There will be more good papers published in this area. Evolutionary Computing has much more potential in power systems analysis than is shown in Table 1 in terms of Genetic Algorithms, but more needs to be understood in relation to the computing requirements and convergence properties of this fascinating approach.

For the control of a substation by methods for the association of gadgets for improving its exhibition, it's important to recollect the estimations of the electrical extents still because the status of some control gadgets that characterize their topology. Control and security gadgets

VII. References

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