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[COTII- 2018]

ISSN 2348 – 8034
Impact Factor- 5.070

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES

ARTIFICIAL INTELLIGENCE BASED SYSTEMATIC IMPLEMENTATION ON CRITICAL ROOTING FOR KR C4 CONTROLLER

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ABSTRACT

One of the foremost vital aspects in commission of RTOS based root integration in artificial intelligence is that the communication of industrial and service robots with their users. Since these users should normally be thought-about as not accustomed to either robots or computers, this communication should occur in an exceedingly human-oriented manner root and use human-understandable symbols. Here, two techniques relying heavily on learning mechanisms square measure conferred that facilitate this type of communication: Programming by Demonstration allows the user to simply communicate action and world information to the mechanism. Operational ideas support this task, however they'll yet be utilized by the mechanism itself so as to speak its own information to the user in a lucid means. A few years have passed since the primary path designing rule was found. These algorithms have evolved plenty since then. Even the simplest of the trail finding algorithms were incapable to provide the perfect result that was required to search out the trail. Particularly in terrains wherever the algorithms couldn't overcome the obstacle as a result of that scenario wasn't foreseen beforehand. The perfect root path was found mistreatment trial and error strategies once the unheralded events to the collision of the mechanism. This downside was resolved once the robots gained the power to trounce itself in these things by learning what went wrong on its own and ensuring the precise same event doesn't occur once more. These machine learning algorithms emerged within the past decade and were incessantly temporary and were formed to possess a really high success rate. During this integration of the trail finding algorithms, the timeline and also the operating of algorithms and the way these algorithms have developed and actual integration result will show on algorithm root file.

Keywords: *Artificial Intelligence, KR-C4 controller, VxWork, KRL programs, layouting root, sys.config, config.dat.*

I. INTRODUCTION

A robot is a part of a flexible production system, machine tools, different auxiliary elements, control devices, and transport machines. A flexible production system (FPS) is an automatically operating production system that can easily re-programmed and adapted to manufacture different products in production line. Flexible production system centered modules of the robotics, called robotic systems or robot modules are intended for specified technological operations like surface coating, painting, packaging, welding etc. The robot module includes one or more robots (with control devices like controller KR c4 and manipulators), pallets for details or products, auxiliary positioning, transport devices, etc.

ISSN 2348 – 8034
Impact Factor- 5.070

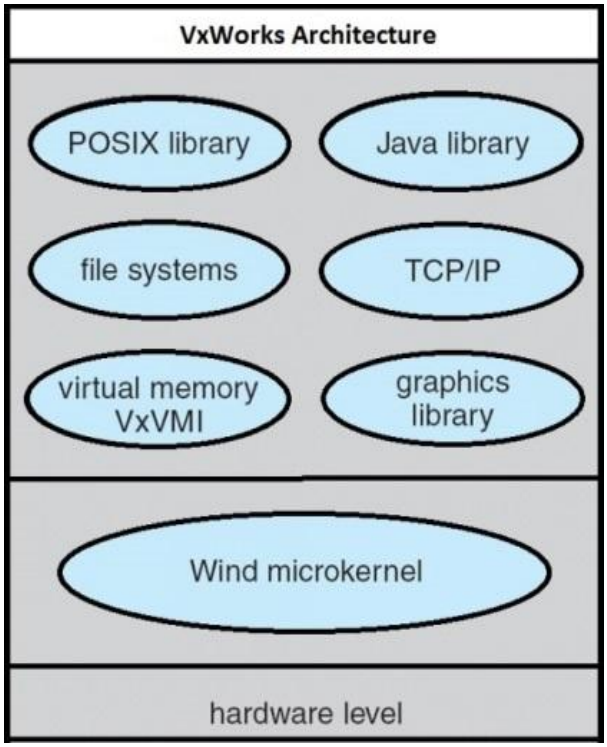

Figure. 1 VxWorks Architecure

In this paper by the used real-time operating systems (RTOS) VxWorks scheduling of kernal working other issues.

The concept of RTOS based rooting is to finalize the service of industrial robots, which allows a multitasking kernel with pre-emptive scheduling that guarantees fast interrupt handling and it can work fast. It is inter-process communications as an I/O devices.

A real-time operating system is a computer system by which it required by its specification to adhere to:

- Temporal Requirements (Timing Constraints, Deadlines).
- Functional Requirements (Behavior).

II. METHODOLOGY

It can be described as an connected assembly of normal processing elements (or units/nodes). The ability of a system processing on network is stored in the unit connection strengths which is obtained by a process of learning from training patterns. A typical AI system consists of three layers one input layer, one output layer and one hidden layer. All layers have several units. In that training pattern its output is a function of sum of their inputs. The Input of a node is a sum of outputs which nodes are connected to it.

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Impact Factor- 5.070

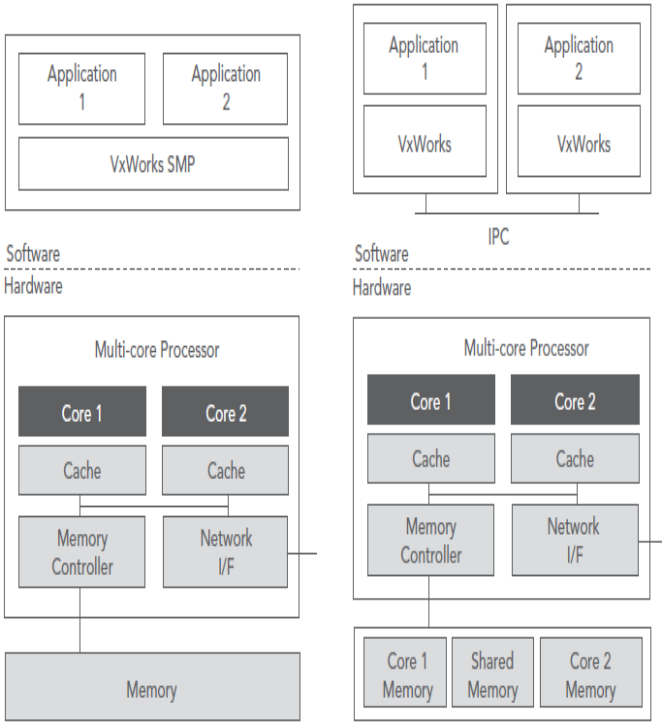

Figure. 2 Network Stack and RTOS based VxWorks Componet for Rooting of BIOS.

This real-time system engineering is so multi-disciplinary so that it stands out as a highly specialized area like controlling tasks. The VxWorks allows to add connectivity communication via Ethernet (TCP/IP protocol) on network.

The RCC is interfaced that is an dataflow language called Real time Primitives Interface (RPI).

Figure. 3 Manipulator

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III. KR C4 CONTROLLER

The KR-C4 Controller is a leading controller used in any automation industry today and tomorrow. It **reduces costs** in servicing, maintenance and integration. KUKA KR-C4 software architecture marge with Motion Control, Robotic Control, PLC Control in KUKA.CNC and Safety Control. All controllers share its database and infrastructure. The Robotic control and Motion control are uniform in quality and interactively merged with control processes for CNC, PLC and Safety measurement. In the help of flexible robotic programming via inline forms and Spline motion programming.

High-end Soft-PLC option allows full access to the KR-C4 controller Input/Output system and a high runtime performance by the controller. It allows the Input handling as well as Output handling of the robots, a complete line of robot cell. A variables such as axis positions or velocities can be read and processed via function blocks to the cell.

The robot controller consistent with of the following components:

- Control PC (KPC)
- Drive controller: KUKA Servo Pack (KSP)
- Teach pendant (KUKA smartPAD)
- Low-voltage power supply unit
- Controller System Panel (CSP)
- Fuse elements
- Connection panel
- Drive power supply with drive controller: KUKA Power Pack (KPP)
- Safety Interface Board (SIB)
- Cabinet Control Unit (CCU)
- Batteries
- Fans

Figure. 4 KR C-4 Controller

IV. CABINET CONTROL UNIT (CCU)

The central power distributor and its communication interface for components of the robot controller. The Cabinet Control Unit (CCU) combination of the Cabinet Interface Board (CIB) and the Power Management Board (PMB). All data transferred via internal communication interface to the controller for further processing.

Table 1 Technical data

Cabinet type	KR C4
Number of axes	max. 9
Weight (without transformer)	150 kg
Protection rating	IP 54
Sound level according to DIN 45635-1	average: 67 dB (A)
Installation with other cabinets (with/without cooling unit)	Side-by-side, clearance 50 mm
Load on cabinet roof with even distribution	1,500 N

V. ARTIFICIAL NEURAL NETWORK (ANN)

The inventor of neurocomputer, Dr. Robert Hecht-Nielsen, defines a neural network as given −

"A computing system made by a number of simple, highly inter-connected processing elements, which can process information by dynamic state response to the external inputs."

The working of human brain by making the right connections through neurons. It can be follow as a model using silicon and the wires as a living neurons and dendrites.

The human brain is having of 86 billion nerve cells called it neurons they all thousand cells by Axons which connected to other Stimuli from external environment which is similar to the working of human brain are accepted by dendrites. It creates electric impulses by which it can travel through the artificial neural network. Neuron can send the message as per requirement to other neuron to transfer information.

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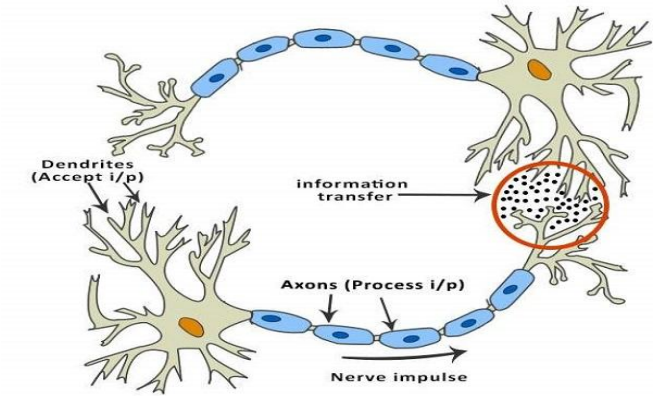

Figure. 5 Neurons Impulses

ANNs are composed with multiple nodes by its biological neurons of human brain. The neurons are connected by its next connected nodes links and all they interact with each other. All nodes can take input and perform simple operations by the use of the input on the data. The result of these operations is shared to other neurons. The output of at each node is called its node value or activation.

ANNs are capable of learning by its input and sharing results, which takes place by altering weight values. The following illustration shows simple ANN operations –

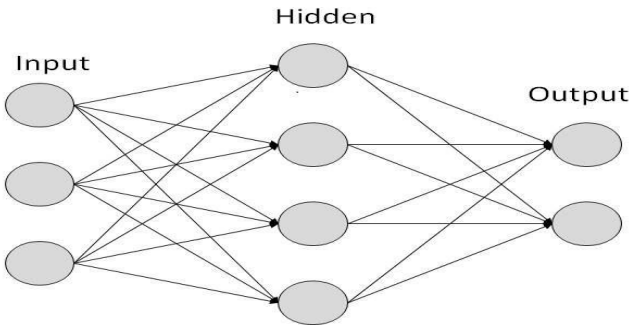

Figure. 6 ANN Operations

VI. CONCLUSION

It's very clear that RTOS based root integration in artificial intelligence is very effective for the communication of industrial and service robots with their users. By the used of this any user can customized either robots or computers, and it is based on human-oriented manner root to do task. These machine can learning algorithms (set of rules) which can emerged. RTOSes are very powerful for a large scale of applications and it depends on logical knowledge to choose the proper outcome for industrial system. So the system should be very familiar with the characteristics of the robotic machine with the help of KR-C4 controller.

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