

RTOS BASED AUTOMATIC SECHDULING FOR MILITARY APPLICATIONS

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Abstract — This paper is an Rtos based architecture designed for the purpose of metal detection. The main objective of the RTOS is to manage the allocation of the resources to users in an orderly and controlled manner. Here, Sechduling is the one which is uesd to aviod the delay between one application with another. We are using in the mobile communication to receive the condition of the border level. Using mobile communication we are giving the indication to the monitoring section. The RTOS based automatic Sechduling is done all applications at a time without any timedelay.

based on the sensor the lighting system will on condition. Any sound will come due to mine explored it will detect by the sensor and through mobile communication it will send information to military sections. This paper deals with the data receiving from sensor nodes without any dealy. The data receiving time is increased with the mobile communication.

A RTOS comprises of two components, viz., "Real-time" and "operating system" . Real time systems are those systems in which the correctness of the system depends not only on the logical result of computation, but also on the time at which the results are produced. RTOS are those which must produce correct response with in a definite time limit. By use of proper techniques of Sechduling, we can perform multiple task in a given time.

Keywords: RTOS (Real Time Operation System), ROBOTICS, GSM (Global system for Mobile communication), ARM (Advanced Risc machine).

DESIGN AND IMPLEMENTATION

The figure shows the block diagram of proposed system. It mainly deals with the interfacing of different IO device's and operating them by using RTOS.

INTRODUCTION

RTOS is a process which will be done between hardware and application. The job of the RTOS is to manage the allocation of the resources to users in an orderly and controlled manner. This sensor node is compose of a micro-processors, transceivers, displays and analog to digital converters . Sensor nodes are deployed for military process monitoring and control.

The basic view of this technique is to reduce the damages to the human and gives the information about mine in the border section. If the light intensity is reduced means

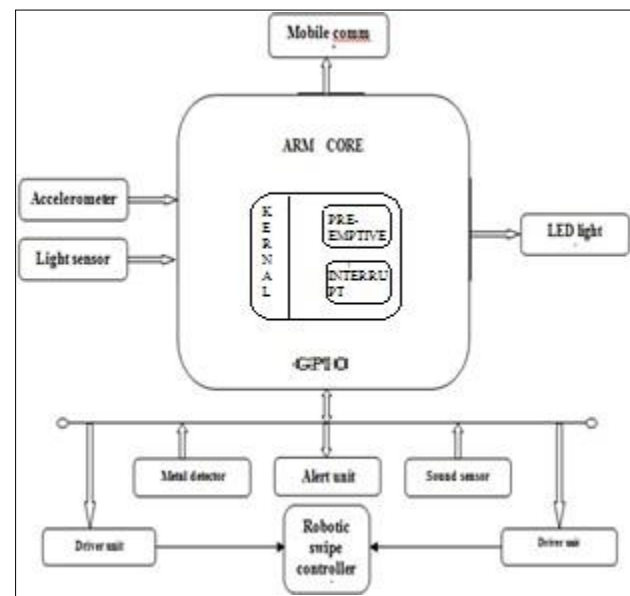


Fig 1: Block diagram of ROBOT structure

The ARM7 is a family of processors TDMI, TDMI_S, 720T and EJ-S Processors. The ARMTDMI architecture core is the enterprise's mainly used 32-bit embedded RISC microprocessor. Optimised for price and power sensitive

functions, the ARM7TDMI answer presents the low energy consumption, small dimension, embedded functions. The ARM7TDMI architecture, exiting in both the languages VERILOG and VHDL, able for compilation into tactics supported by incondominium or commercially available synthesis libraries.

- Operating techniques reminiscent of Linux, SYMBIAN OS , plam OS and windows CE,
- Additional with 40 real-time running programs, together with Qnx, win driver'sVx workers and mnetographics

LPC2148 microcontroller is based on a 16-bit or 32-bit TDMI-S central processor with real-time emulation and embedded trace help that combine microcontrollers with embedded excessive-velocity flash memory ranging between 32kB-512kB. A 128-bit vast memory interface and particular accelerator structural design allow 32-bit code execution at the highest clock fee. The means of LPC is Low power Low cost microcontroller. That is 32 bit microcontroller manufactured by way of Philips semiconductors (NXP). Due to their small size and little power utilisation, LPC2148 is ideal for applications the place miniaturizatiin iskey.

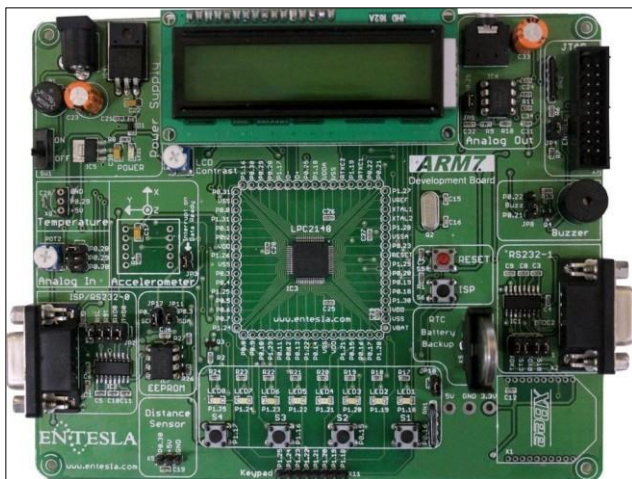


Fig 2: LPC2148 Controller

Metal detecting sensor will detect metal objects up to 7cm. If it detects any metal then it will give active low output with LED indication and buzzer ON. The heart of this sensor is the inductive Oscillator circuit which monitor's high frequency current loss in coil. The circuit is designed for any metallic body detection by detecting the variations in the high frequency Eddy current losses. With an external tuned circuit

they act as Oscillators. Output signal level is altered by approaching metallic objects. Output signal is determined by supply current changes. Independent of supply voltage, this current is high or low according to the presence or absence of a close metallic objects. If the metal object is near by the searching coil, the output current will flow more. in contrast the current will be decreased when the object is far from the searching coil. interfaces one on either side. One interface acts as a contact smart chip and the other acts as a contactless smart chip.

E.g. Within the transport market money can be loaded securely using the contact interface and when customers need to use them on buses use the simple contactless interface.



Fig 3: Metal detecting object

SPECIFICATIONS.

- Detection range variable up to 7cm.
- Operation range vary according to size of the metallic objects.
- Power supply: 5V DC Power
- Consumption: 50mAmx.
- Detection Indication LED and Buzzer.
- Digital output.
- Active with logic"0".
- Dimensions : 52x71mm.

Full SMD design. If the metal detecting sensor will detect the metals. The. It will send the alert message using GSM module. GSM is a digital mobile phone system that's greatly utilize in many elements of the sector. GSM uses a variation of Time Division Multiple access (TDMA) and is probably the most broadly used of the three digital wi-fi telephone

technologies (TDMA, GSM and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of consumer knowledge, each and every in its possess time slot. GSM operates within the 900MHz, 1800MHz, or 1900MHz frequency bands.

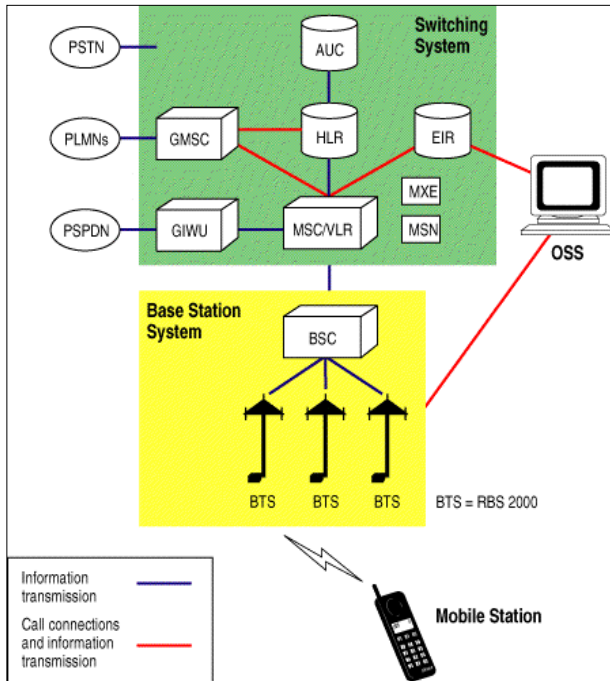


Fig 4: Block diagram of GSM Community elements

The GSM community is split into three essential systems: The switching procedure (SS), the base station procedure (BSS), and the operation and aid process (OSS). The basic GSM network factors are shown in above figure.

GSM MODEM

A GSM modem is a wi-fi modem that works with a GSM wireless network. A wireless modem behaves like a dial up modem. The predominant change between is that a dial-up modem sends and receives information through a constant mobile phone line even as a wireless modem sends and receives data by receiving radio waves.

A GSM modem will also be an external gadget or a laptop Card / PCMCIA Card. In general, an outside GSM modem is attached to a laptop via a serial cable or a USB cable. A GSM modem with in the type of a laptop / PCMCIA Card is

designed for use with a laptop computer. It must be inserted into one of the computer Card / PCMCIA Card slots of a computer laptop.

In addition to the common AT commands, GSM modem support an multiplied set of AT commands.. These elevated AT instructions are defined within the GSM standards. With the elevated AT commands, you are able to do thingslike.

- Studying, Writing and deleting SMS messages.
- Sending SMS messages.
- Monitoring the changing reputation and cost level of the battery.
- Studying, writing and looking cell phone e-Bookentries.

The number of SMS messages that may be processed by using a GSM modem per minute could be very low only about six to ten SMS messages per minute.

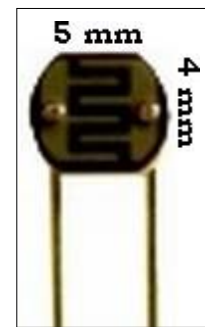


Fig 5: LDR Sensor

You can also make a robot which moves when it hears a sound and stops on detecting silence. Although this board is not intelligent to separate different sounds this is a low cost alternative

RTOS is an operation system which is used to perform a task within a particular time interval i.e. within the specific allocation time. It is a real time operating system. A real time OS that can usually or generally meet a deadline deterministically it is a hard real-time OS. Compared with OS and RTOS, RTOS only supports the multitasking operations and time Scheduling tasks. Real time OS is the level of its consistency concerning the amount of time it takes to accept and complete an applications task. If we implemented any task without RTOS, it is less accuracy and

time delay of the specified time and normally it can possible to perform only one task at a time.

COMPLETED SYSTEMS

As we are willing to develop a RTOS based scheduling then it will be mandatory to achieve the automatic scheduling for military application. It was operated automatically by having the inbuilt path assigned for the robot. Metal detecting sensor was sending the alert message using GSM module whenever if it detects any metal in it's path. LDR sensor used is to adjust the lighting system by comparing the light intensity values read by the sensor. If the robot was subjected to fall down then the accelerometer sensor will intimate by using the LCD displays as well it also sends the message by using GSM module.

ADVANTAGES AND DISADVANTAGES

Advantages:

- Priority Based scheduling
- Abstracting timing Information
- Maintainability/Extensibility, Modularity
- Promotes team development
- Easier testing
- Code reuse
- Improved Efficiency
- Idle processing(High integrity systems)

Disadvantages:

- Limited tasks
- Use heavy system resources
- Complex algorithms
- Device driver and interrupt signals
- Thread priority

CONCLUSION

This technique is used to reduce the damages to the human and gives the information about mine in the border section. Any sound will come due to mine explored will detected by the sensor and through mobile communication it will send information to military sections.

REFERENCES

[1] M. Piaggio, A. Sgorissa, and R. Zacxaria, "pre-emptive versus non-pre-emptive real time scheduling in intelligent mobile robotics," J.Exp. Theor. Artif.Intel., Vol. 12, no. 2, pp.235 -245, 2000.

- [2] H. Bruyninckx, "Open robot control software robot.
- [3] L. B. Becker and C. E. Peretia, "SIMOO-RT _An object-oriented frame work for the development of real time industrial automation systems, "IEEE Trans. Robot., Vol.18, no. 4, pp.421-430,
- [4] R. Brennan, M. Fletcher, and D. Norrie, " An agent-based approach to Reconfiguration of real-time distributed control systems", IEEE Trans. Robot.Autom. , Vol. 18
- [5] A. D. Nesnas. A.Wright. M. Bairacharya Simmons , and T. Estlin, " CLARATy and Challenges of developing interoperable robotic software, " improc. 2003 IEEE/ RSJ Int. Cong. Intell. Robot. Syst., 2033, pp.2428-2435.
- [6] A. Brooks, T. Kaupp, A. Makarenko, S. Williams, and A. Oreback, "Towards comment-based robotics, " in Proc. IEEE/RSJ Int. Conf.Intell. Robotic.