

Research Summary on Embedded Systems

An embedded system is a piece of hardware that has some built-in software in order for it to perform a specific task. This task that needs to be performed can either be predetermined or can be later determined if the system is programmable. However, this does not change the fact that each of these systems are designed with a specific task in mind and will only serve that purpose whether it is an independent system or part of a larger one. Embedded systems also have a Real Time Operating System or RTOS for short. A real time operating system is used when the data that comes in needs to be processed right away without any delays.

At the heart of any embedded system is an integrated circuit. This integrated circuit can either be a microprocessor or a microcontroller. The main difference between the two is that the microprocessors only act as a central processing unit and therefore, would require other components to make the system whole. The microcontrollers on the other hand are an entire system in and of themselves.

Embedded systems have many characteristics that other kinds of systems do not have. One of these characteristics is the extent to which they are reactive. In many cases, a system must react to changes that are occurring in its environment and give an output or result with little to no delay.

Some examples of embedded systems are ATMs, pagers, smoke detectors, thermostats, calculators, printers and much more. The main risk when it comes to embedded systems and the fact that they need to be extremely reactive is that if any malfunction were to happen it could possibly cause harm to the user.

Many of the devices we use today are examples of embedded systems and they've proven to be very useful to us.

Websites I used:

https://www.tutorialspoint.com/embedded_systems/es_overview.htm

<http://internetofthingsagenda.techtarget.com/definition/embedded-system>

<https://www.ece.ncsu.edu/research/cas/ecs>