

JUNE 2022

NEWSLETTER

DEPARTMENT OF ELECTRONIC ENGINEERING

Webinar on "Smart Controllers"

Smart control is controlling and managing the basic operations in a household automatically. It is very inconvenient to have to do every single task manually so to make our lives a bit easier, the concept of smart control has been introduced.

Smart control necessitates us to introduce computerized or automatic electrical and electronic systems either house or factory. These include lighting, motors, air conditioning, machines etc. A microprocessor or microcontroller based system is used to control the various appliances. These systems control the appliances according to configuration. For example, they will be capable to turn on the lights at a particular time, automatically turning motor on and off and by timer also, locking doors. By using Wi-Fi you can control and manage your devices anywhere in the world with the development of intelligent hardware, more diverse sensing devices have emerged in the field of the Internet of Things (IoT), from the original single indicator sensor, such as temperature sensor, to the multi-indicator integrated sensor. The number of smart home sensing devices has increased from a few to hundreds. In addition to sensing devices, smart devices are also growing rapidly, such as smart audio, smart refrigerators, and smart air-conditioners. The development of hardware makes intelligent control possible. According to the research results of literature,¹ the infrastructure of the IoT at this stage can only provide the basic communication function of the device. There are a lack of corresponding realization mechanisms and solutions for intelligent interactions and services in complex environments.

As one of the application fields of the IoT, this problem also exists in the smart home environment.² Although several solutions have been proposed by some scholars, most of them are not intelligent enough to realize automatic control and cannot meet the needs of users. Other solutions that provide automatic control are biased to engineering implementation and lack of theoretical methods. What's more, they are not mature enough in terms of data abstraction and context expression. Therefore, it is necessary to realize intelligence of equipment and automatic invocation of services. The research goal in the field of home intelligent control is to provide the required services to users according to their identity, preference, and current environment.

The remaining structure of the article is as follows. Section "Related works" covers the brief summary of latest research achievement. In section "The IConS Architecture", the intelligent control model of context awareness and intelligent control framework are illustrated. In section "Context-aware modeling", IConS model method based on object and attribute graph is described. We present intelligent control method and prototype system in section "Home Intelligent Control Technology", and section "prototype system and experimental comparison."

The Smart Controller project allows the user to control games on laptop via smart phone using wireless technology like Wi-Fi.



WEBINAR
on 5th April 2021
Smart Switches
By
ER. RAMANDEEP GROVER,
Techpecs Research and Innovations Services, Mohali.
Department of Electrical Engineering
BHAI GURDAS INSTITUTE OF ENGINEERING & TECHNOLOGY, SANGRUR



Event outcome

Conceptual details
of smart controllers
with applications

Chief Guest/Resource Persons

Er. Ramndeep Grover
Techpac Research and
innovation services,
Mohali

Guest lectures on " Electronics Devices"

Electronic devices act a important roll in our daily life. It becomes our assistance, our friend and maybe our enemy. I am really interesting in electronic devices and want to do some deep research because my family members and some of my classmate are suffer from their mobile phones&computers and they go to sleep really late. I want to find the right way to use the electronic devices so that we can use the advantages and don't get a bad influence by it.

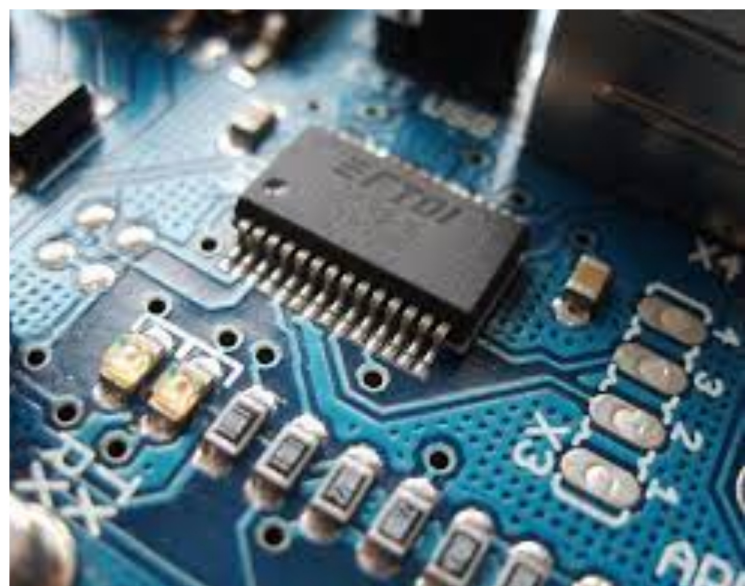
With the development of the economy and the progress of science and technology, the electronic products are popularized in the people 's production and life, which brings great convenience to the people 's production and life. The popularity of electronic products has made people use the way of letters to become more convenient ways of communication through mobile phone, telephone or even Internet chat software.

You can make use of the network to negotiate business and file the transmission. Distant relatives and friends can also chat by video, and narrow the distance between them. Nowadays the change is due to the progress of science and technology, the popularization and intelligence of electronic products, making people communicate with each other more smoothly and quickly.

Electronics is the branch of physics and technology that deals with circuits, transistors, microchips, and the behaviour and movement of electrons. It handles electric circuits containing active and passive elements and uses underlying techniques. It is an important part of engineering. Technologies are growing at a very fast rate in the world, and it is important for technology enthusiasts to pace up with the latest changes in society.

Electronic devices have become an important part of our day-to-day life. It has become difficult for us to do work without using electronic devices.

We live in a generation that uses electronics and technologies where robots and artificial intelligence are capable of doing human work with more ease and efficiency. Electronics in our daily life are made up of active and passive electric elements and smaller integrated circuits (IC).The ICs, transistors, and diodes are made of semiconductor materials, which work when current flows through them.



History of Electronics

The first electronic device was introduced by an American scientist, Sir Joseph Henry, in the year 1835. He invented a remote switch that was controlled by electricity.

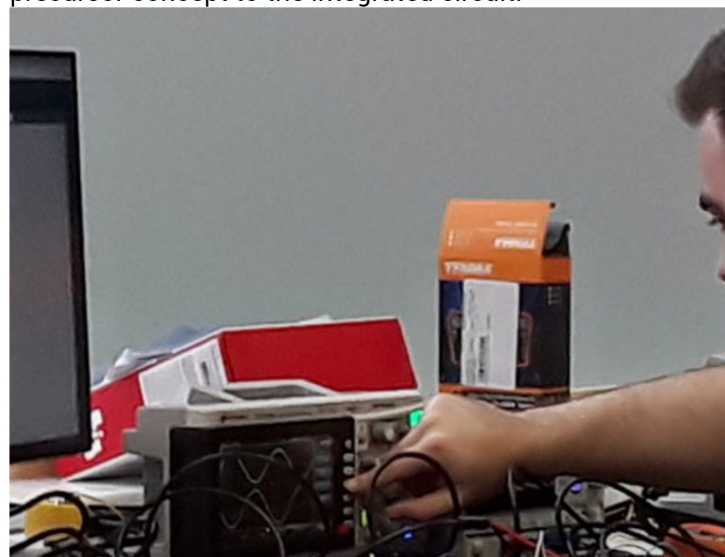
However, the credit for this invention was given to an English inventor Edward Davy in his electric telegraph c. 1835.

Some Other Inventions are

Vacuum Diode – It was invented by John Ambrose Fleming (1897). After that, Lee De Forest invented the Vacuum Triode which was used to amplify electrical signals. And that paved the way for tetrode as well as pentode tubes.

Transistor – It was invented by the combined effort of John Bardeen, Walter Brattain, and William Shockley. The invention of the junction transistor in 1948 led to the transistor era.

IC (Integrated Circuit) – Jack Kilby invented this. A precursor concept to the integrated circuit.



Chief Guest/Resource Persons

Er. Madhusudhan,
Semiconic devices
pvt ltd. New Delhi



Event outcome

Latest trends

and developments in

Electronics components

One day workshop on Energy Efficient Machines

Efficient use of energy have become more frequent in many sectors of industry. Machine tools comprise numerous motors and auxiliary components whose energy consumption can vary strongly during machining. The main spindle drive, for example, and the coolant system work near their rated power during roughing with a high stock removal rate, while the power consumption during finishing is significantly lower. There is a very close interdependence between the individual components and subassemblies of a machine tool and aspects of productivity and quality. From a detailed examination of manufacturing processes to the power consumption of individual components, potential for savings can be evaluated and measures can be defined for the efficient use of energy.

Geared motors for materials handling technology have been divided into efficiency classes for some time now. A multitude of ideas has been tried for increasing energy efficiency in manufacturing with machine tools. Potential savings result with regard to the base load of machine tools that require energy consumption, even in nonproductive phases. The base load is determined substantially by the auxiliary components of a machine. Besides the use of energy-efficient motors in the auxiliary components, many possibilities for reducing the base load can be found in proper energy management. With energy management, consumers are specifically switched off by the machine control in nonproductive phases.

Energy is a key input for the manufacturing industry in addition to the material resources required. Currently, the industry is studying energy efficiency from two perspectives – environmental & cost. During the last ten years, the cost of energy has almost tripled, and the energy consumption throughout the world, including India, has increased to a great extent. For example, the energy consumption by Indian manufacturing was 5.5% in 2009, and it is expected to grow by 8.6% by 2035. Energy efficiency has become an integral part of the manufacturing industries to improve economic & environmental performance and increase competitiveness. Machine tools are not only the major energy consumer in the manufacturing industry but also have low efficiency. The reduction of 1% energy consumption for machine activities can save approximately 200 joules per year. The industry will save a significant amount of energy by saving 1% of the 33% reduction. Compared with the automotive industry, which is highly dependent on energy, and is usually lashed due to carbon emissions, the machine tool industry is not focused on energy efficiency.

The machine tool industry should focus on energy efficiency, and in the current scenario as 99% of the carbon emission of machine tools comes from electricity consumption. Fixed energy and variable energy are the two types of energy consumption. Since Taylor's equation was introduced in 1907, numerous theories discuss the optimization of cutting parameters. However, the cutting parameters or variable energy consumes only 15% of energy, whereas fixed energy consumes 85% of energy.

Apparently, researchers have still not focused on reducing fixed energy consumption. It is essential to focus on this specific energy bracket, which will create an impactful difference in the industry. The savings from this 85% of fixed energy can be achieved by focusing on various factors such as different modeling of energy consumption, and strategies to work towards



Event Outcome

Working concepts
and reductions of
losses in machines

Chief Guest/Resource Persons

Dr. Munish Kumar,
Assistant professor Central
university, Haryana

Republic Day Celebration

Republic Day is one of three Indian national holidays and it commemorates the enactment of the constitution of India, which occurred on January 26, 1950. India had achieved independence from Britain on August 15, 1947 (which is celebrated as a separate national holiday), but for its first three years the country remained governed largely by the colonial Government of India Act of 1935. Shortly after independence was declared, a constituent assembly elected by provincial assemblies went about drafting a constitution that would govern the newly independent nation. After more than two years, the constitution of India was completed and solidified the establishment of India's independent democratic government. January 26 was chosen as the official enactment date as a nod to the Purna Swaraj (complete self-rule) declaration of independence by the Indian National Congress in 1930 – considered the first concrete step toward independence from



Lohri Celebration

Lohri is the first of India's rich and diverse melange of festivals to be celebrated with great pomp and energy across different regions of the country in the new calendar year. In North India, and predominantly Punjab, this harvesting festival begins the year's festivities with a tribute to the farmers for their hard toil and labor that enables us to live prosperous lives.

This is the harvest season for Punjabi farmers when they begin to reap the bounty of their harvest of the Rabi crops – mainly wheat. This period marks the end of the winter solstice, after which we can expect warmer and longer days.



Basant Panchnami Celebration

Basant or Vasant Panchmi is one of the prominent Indian festivals that celebrates the advent of Spring Season. This festival is also celebrated as Saraswati Puja, an ode to Goddess Saraswati, the deity of wisdom, knowledge or gyan, art, and culture. This auspicious festival is celebrated with a lot of joy, happiness, excitement, and devotion. People get dressed up in yellow, representing the mustard fields of Haryana and Punjab. On this day, children attending the school for the first time are encouraged to write their first words in front of the Goddess Saraswati Pooja.

