

# CET

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NURTURE THE BEST

Journal of  
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ISSUE-3  
VOLUME-2

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ADROITNESS  
IN INNOVATION

ELECTRONICS & INSTRUMENTATION ENGINEERING

**DR. MAHALINGAM COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**DEPARTMENT ELECTRONICS AND INSTRUMENTATION ENGINEERING**

Dr. Mahalingam College of Engineering and Technology (MCET) is a self – financing educational institution situated in Pollachi, Coimbatore District. MCET is the vision of Arutchelvar Dr. N. Mahalingam, whose determination and dynamism made possible the realization of this institution of excellence. MCET was established in 1998 to commemorate the 75th Birthday of this great visionary Arutchelvar Dr. N. computer facilities and techniques.

**VISION:**

We develop a globally competitive workforce and entrepreneurs.

**MISSION:**

Dr. Mahalingam College of Engineering and Technology, Pollachi endeavors to impart high quality, competency based technical education in Engineering and Technology to the younger generation with the required skills and abilities to face the challenging needs of the industry around the globe. This institution is also striving hard to attain a unique status in the international level by means of infrastructure, state-of-the-art computer facilities and techniques mission icon core value.

**CORE VALUES:**

- Equity.
- Transparency
- Creativity
- Team Work
- Environment Sustainability
- Staff Development
- Women in Development.

**NIA INSTITUTIONS:**

The society's solicitation made him the Chairman of NIA to expand education right from schooling to engineering. Within a short span of 50 years the bud- NIA- has blossomed in lot many avenues and has spread its fragrance in industrialization, education, finance, transportation, synthetic gems, textiles, agriculture and automobiles.

Nachimuthu Industrial Association not only shelters the society by offering jobs in which it flourishes but also been a preamble for rural students to gain knowledge and explore the fast-paced world. Having made the institution a banyan tree in which entire society can shelter. The Chairman after rendering his tireless work, he has become the Emeritus course-icon.

The Himalayan achievement in education and developing society, the industrial genius has been recognized by Government of India and had conferred Padma Bhusan on him in 2007.

#### **DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING**

Department of Electronics & Instrumentation was started in the year 2011, aiming to produce quality engineers with the knowledge of the latest trends and developments in the field of industrial automation. Department provides a platform for the learners to equip themselves with the knowledge transferred from the faculty expertise, state-of-the-art laboratory facilities, software and motivation for the other value added co-curricular activities. In the recent scenario, developments taking place in areas like Process Control, Communication, Space, Medicine, Defense etc., open up large number of opportunities for engineers specializing in Instrumentation and Control Engineering. Department of EIE is focusing on better academics and better career planning.

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#### **DEPARTMENT VISION**

To develop globally competent instrumentation engineers and entrepreneurs with societal, environmental and human values

#### **DEPARTMENT MISSION**

**Supportive Learning Environment:** Provide suitable learning environment to the graduates with innovative learning resources and adequate infrastructure.

**Engineering Skills:** Enhance electronic, instrumentation and automation skills of the engineering graduates to fulfill the industrial requirements.

**Sustainable and Eco-Friendly:** Create awareness among the graduates for sustainable, eco friendly products and safety standards.

**Ethical and Professional Responsibility:** Enrich continuous learning, communicative, collaborative and administrative skills of the engineering graduates to become ethical, social responsible engineers and entrepreneurs

**Program Educational Objectives (PEOs):**

**PEO1: Technical Excellence:** Actively apply technical and professional skills in engineering practices towards the progress of the organization in competitive and dynamic environment.

**PEO2: Higher Studies & Research:** Own their professional and personal development by continuous learning and apply the learning at work to create new knowledge.

**PEO3: Professional & Ethical Knowledge :** Conduct themselves in a responsible, professional and ethical manner supporting sustainable economic development which enhances the quality of life.

**Programme Outcomes (POs):**

**PO1. Engineering knowledge:** Apply the knowledge of Mathematics, Science and engineering to solve problems in the field of Electronics & Instrumentation Engineering.

**PO2 .Problem Analysis:** Identify, formulate/model, analyse and solve complex problems in the field of Electronics & Instrumentation Engineering.

**PO3.Design and Development:** Design an electronic system/component, or process to meet specific purpose with due consideration for economic, environmental, social, political, ethical, health and safety issues.

**PO4.Conduct Investigations:** Design and conduct experiment, analyse and interpret data to provide valid conclusions in the field of Electronics and Instrumentation Engineering.

**PO5 .Modern Tool Usage:** Apply appropriate techniques and modern software tools for design and analysis of Electronic systems with specified constraints.

**PO6.Engineer and Society:** Apply contextual knowledge to provide engineering solutions with societal, professional & environmental responsibilities

**PO7.Environment and Sustainability:** Provide sustainable solutions within societal and environmental contexts for problems related to Electronics & Instrumentation Engineering.

**PO8.Ethics:** Comply with code of conduct and professional ethics in engineering practices

**PO9.Individual and Teamwork:** Perform effectively as a member/leader in multidisciplinary teams.

**PO10.Communication:** Communicate effectively to engineering community and society with proper aids and Documents.

**PO11.Project management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles to manage projects in multidisciplinary environment.

**PO12.Lifelong Learning:** Recognise the need for, and have the ability to engage in independent and lifelong learning.

**Programme Specific Outcomes (PSOs):**

**PSO1: Instrument Analysis:** Analyze and monitor the characteristics of electronic measuring instruments and controllers to ensure performance, safety and quality of the process

**PSO2: Controller Selection:** Select the suitable instruments, control scheme and controllers as per the requirements.

# **INDUSTRY 4.0**

**by**

**V.BHUVYA MARUTHI**

**16BEI039,**

In the initial stages of technical progression. The discovery of steam and development of the machines mechanized some of the work done by our ancestors. The next introduced electricity, has been the the birth of mass production. The third era of industry came about with the advent of computers and the beginning of automation, where robots and machines began to replace human workers on those assembly lines.

And now we are entering into the highly technified Industry 4.0, in which computers and automation will come together in an entirely new way of approach. The robots are connected remotely to computer

systems equipped with machine learning algorithms that can learn and control the robots with very little input from human operators.

Industry 4.0 introduces us to a new set-up called "smart factory" in which the digital devices monitor the physical processes of the factory and make decentralized decisions. The digital devices constitutes to Internet of Things, communicating with each other and with humans in real time via the wireless web.

**INDUSTRY WITH INDUSTRY4.0:**

Any system said to coincide with the "INDUSTRY4.0" will have to make their vision and

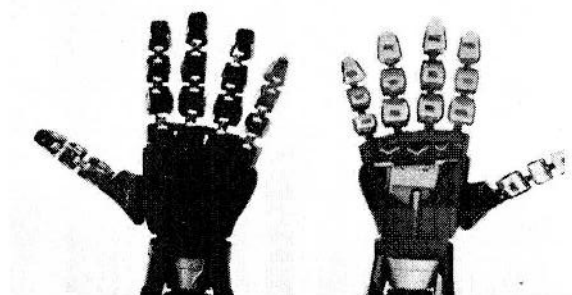
## RUBBER ELECTRONICS AND SENSOR.

by

RAMYARAGAVI.K

16BEI033

Rubber electronics and sensor that operate normally even when stretched up to 50 percent of their length could work as artificial skin on robots, according to a new study. They could also give flexible sensing capabilities to a range of electronic devices. Like human skin, the material is able to sense strain, pressure and temperature.



Humans want to be work near robot and to co-exist with them but for that to happen safely, the robot itself need to be able to fully sense its surroundings. So that they could work aside by human without endangering

them. The electronic skin is used to sense the temperature of hot and cold water in a cup and also translate computer signals sent to the robotic hand into finger gestures representing the alphabet from American sign language.

The researchers applied strips of the material to the finger of a robotic hand. The electronic skin worked as a sensor that produced different electrical signals when the fingers bent.

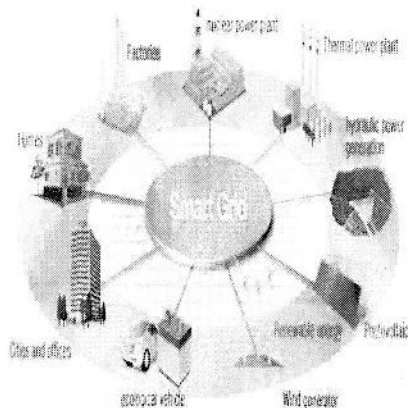
Bending a finger joint puts strain on the material, and that reduces electric current flow in a way that can be measured. Rubber electronics and sensors have wide range of applications, from biomedical implants to WEARABLE ELECTRONICS to digitized clothing to "SMART" surgical gloves.

# SMART GRID

by

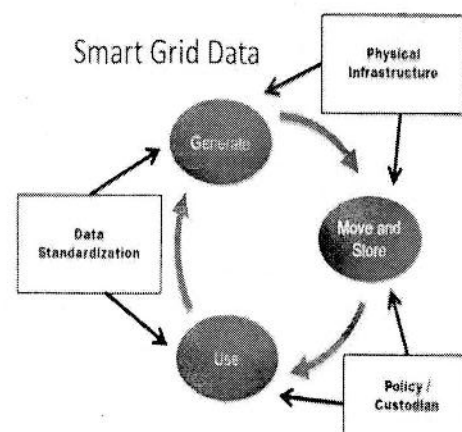
A.SRIPREETHA

16BEI018



A smart grid is an electrical grid which includes a variety of operational and energy measures including smartness, smart appliances, renewable energy resources and energy efficient resources. Smart grid engineering is the key for a beneficial use of widespread energy resources, it is a modernized electrical grid that uses analog or digital information and communications technology. Renewable energy itself a thrust area of research due to its availability, applicability and environmental friendly nature and the application of smart grid

in renewable energy makes it vast and more promising. This fusion enables the efficient use of renewable energies which is a key challenge for now. The present review paper attempts to investigate the role of smart grid in the renewable energy. The introductory section sets the role of renewable energy and distributed power in a smart grid system. Subsections cover the concept and availability of renewable energies, renewable energy power calculation formulae, smart grid concepts and its feasibility, case studied as performed by different researchers around the World, discussion and future recommendations and finally the conclusions from the study.

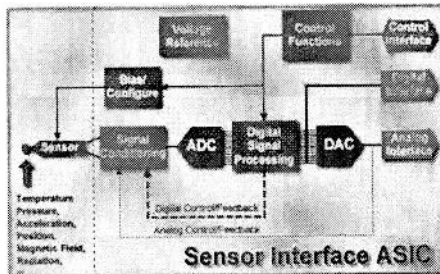


# SMARTSENSOR

by

S.MEENATCHI SUNDARAM

17BEI302



A smart sensor is a device that takes input from the physical environment and uses built-in compute resources to perform predefined functions upon detection of specific input and then process data before passing it on. Smart sensors enable more accurate and automated collection of environmental data with less erroneous noise amongst the accurately recorded information. These devices are used for monitoring and control mechanisms in a wide variety of environments including smart grids, battlefield reconnaissance,

exploration and a great number of science applications. The Internet of Things (IoT) world may be exciting, but there are serious technical challenges that need to be addressed, especially by developers. In this handbook, learn how to meet the security, analytics, and testing requirements for IoT applications.

The smart sensor is also a crucial and integral element in the Internet of Things (IoT), the increasingly prevalent environment in which almost anything imaginable can be outfitted with a unique identifier



# Automation in agriculture

by

**V.RAMYA**

**16BEI003**

The backbone of Indian economy is Agriculture; nearly 20% of the farmers are dependent on electric water pumps for irrigation which demands electricity. The research study conducted by K V S Ram Chandra Murthy (2009) shows that there is a growing demand for electrical energy for irrigation requirements in India and many states electrical utilities companies have been facing acute shortage of power which has led to unrest in the farmers. On top of the power shortage issues, increased demand for power in urban areas (due to globalization, IT, BPOs), have further deteriorated the power supply to agriculture sectors

along with frequent and unreliable power cuts and low voltages. Also, It has been observed that source of electrical energy generation is slowly depleting.

## **ARCHITECTURE OF E-IRRIGATION:**

Motor controls, such as ON/OFF can now be controlled by my proposed System using the mobile SMS technology. "This System" is directly connected to electric motor or any other home appliance controls. The system informs the farmer availability of electric power through SMS. Once the farmer receives the message,

## **VIRTUAL REALITY**

**by**

**S.KARTHIKA**

**16BEI026**

Virtual reality is a technology which allows a user to interact with a environment which is computer –simulated. That may be a real or imagined one. Nowadays the simulated environment can be similar to the real world.

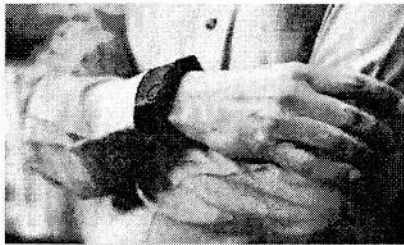
For example, simulation of pilot or combat training. The best useful of this is that it gives ECB tantalizing portrait of future Ashes series. Virtual reality is a computer generated scenario that simulates a realistic experience. Researchers explores virtual reality for controlling satellites in orbits. There is AR (or) augmented reality.

virtual reality is “**The Sensorama**”. It is in the form of an interactive theatre experience ,in 1957. Virtual reality tricks your brain into believing you are in a 3D world. It is the artificial environment that created with software on a computer. Virtual reality is primarily experienced through sight and sound.

**Virtual reality is a self-created form of chosen reality. Therefore it exists.**

## **WEARABLE DEVICE**

**by**  
**THIVYA SREE**  
**16BEI002**



Wearable medical sensors widely used for diagnosing diseases. It is emerging technology in electronics from Apple's smart watches for Fitbit fitness bands.

engineers are working in these wearable sensor technologies to take it one step further by developing software that could be used in multiple health diagnoses from wearable sensors and to diagnose diseases in real-time. When it is fully developed, this system would notify the patient who is developing diabetes, for example.

The research led by Niraj Jha , the Hierarchical Health Decision Support System (HDSS) which is used biomedical data that successfully detect five disease. The paper, published in the journal's Oct.-Dec. issue, states that the system diagnosed type-2 diabetes with 78% of accuracy, arrhythmia with 86 % of accuracy, urinary bladder disorder with 99% of accuracy, hypothyroid with 99% of accuracy and renal pelvis nephritis with 94% of accuracy.

HDSS used publicly available, anonymized biomedical data from hundreds of patients and fed that data through eight machine-learning algorithms that had been trained by the researchers to recognize typical signs of these diseases. The data in HDSS are collected by commercially available medical sensors that

## **BIOMEDICAL INSTRUMENTATION TRENDS TO WATCH**

by  
**BHARANIDHARAN.M**  
**16BEI041**

Biomedical has long been a driver of advances in healthcare. From new technologies to diagnose and treat some of the most complex disease to advances that improve quality of life for everyone, the work taking place in labs around the world right now is likely to change the face of healthcare in both the short- and long-term future.

### **TREND #1: IMPROVING ASSISTIVE TECHNOLOGIES**

Prosthetic technology has already made significant strides in recent decades. Thanks to advances in materials and development, prosthetics are not only lighter and easier to use,

but more advanced than ever before. However, biomedical engineers are working on even more advanced prosthetics that can only be referred to as bionic. In fact, some predict that it won't be too long before amputees will actually be able to control their prosthetics using their minds, just like a biological limb. Chip-enabled prosthetics are on the horizon, but so are limbs that have more mobility and flexibility, or even auxiliary motors that can help provide additional strength and power, making the limb easier to use.

Moving beyond prosthetics, engineers are also working on additional robotic devices that will continue to blur the lines between therapeutic and assistive devices. For instance, researchers are developing robotic exoskeletons to assist people with muscle weakness and other mobility issues. Essentially, the exoskeletons will

## **MASEC PEN**

by

**S.NAGAMEENA**

**16BEI013**

### **CANCER DIAGNOSIS**

The team of Scientists and Engineers of the Texas university at Austin, has invented a tool called MasSpec Pen. This pen rapidly and accurately identifies the cancerous tissue during diagnosis within 10 secs. It helps to know, whether the tissue has to cut or preserve the tissues during treatment. Frozen Section Analysis, method is the slow and inaccurate, which is used for cancer diagnosis and able to identify the boundary between the normal and cancer tissue. In this method, each sample takes 30 minutes , for identification and to interpret by a pathologist ,which may increases the risk of getting infection or negative effects to the patients due to

Anesthesia .

Maximizing cancer removal is critical to improve the patient survival. For example , after cancer diagnosis, Breast cancer patient risk on nerve damage ,throat cancer patients lose ability to regulate the body's calcium levels. The living cells, either healthy or cancerous , produce small molecules called metabolites. Metabolites are involved in generating energy, growing , reproducing other functions in the human body. ***“Cancer cells have dysregulated metabolism as they are growing out of control”***, say Eberlin.

### **ACCURATE REPLACEMENT**

For testing the MasSpec Pen on the tissues, they removed tissues from 253 human cancer patients. It took only **10 secs** for detection also for a result and it is **96%** accurate. The team expects to start this technology in 2018.

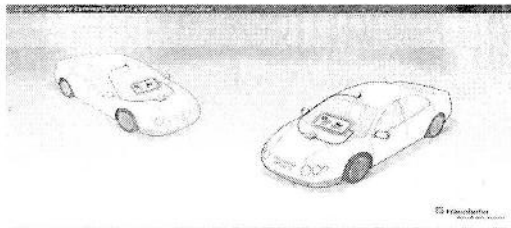
# VEHICLE TO VEHICLE COMMUNICATION

by

SANTHOSH

15BEI047

It address the Wireless communication between vehicle to vehicle and vehicle to its infrastructure.It mainly focus on the Vehicular communication system.



This system uses the Capacity of the vehicle to communicate itself.vehicles will send messages about the speed,location,size,and even they tell us what their fellow owners gonna do around us.

## OBJECTIVE

The main objective of the system Is to transfer information between vehicle to vehicle and the vehicle to road side information system.

## WORKING

This system Uses CAN bus to communicate within the individual vehicle.In this the control the vehicle.

## DRAWBACKS

The main drawback of the system is the decision taking time will be Very less and no prior information to the user regarding the external environment.

## ADVANTAGES

Prior news about blind spot

## SELF NAVIGATION

Collision warning

## DSRC:

The dedicates short range communication system when combines with the gps technology forms the low cost v2v technology.when it is fitted it provides the information and even About the vehicle front and behind us.

## THE LEADING TECHONOLGY:

The leading companies of the world are urging to Produce the vary first selfdriving cars through this technolgy.The google.inc annouced that they are ready

# THE ELECTRONICS

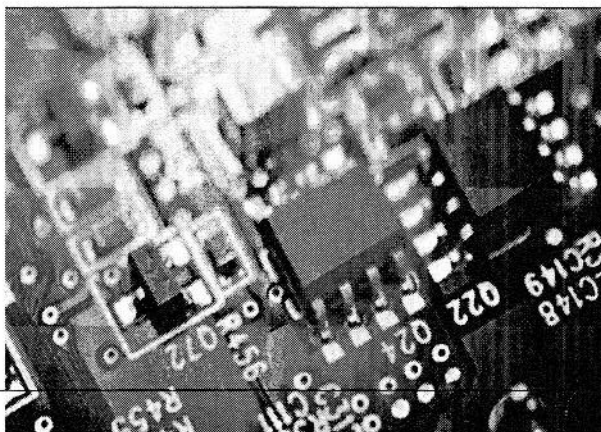
M. NARMATHASREE

17BEI009

This is the article about the technical field of ELECTRONICS. Electronics is the science of controlling electrical energy electrically, in which the electrons have a fundamental role. Electronics deals with electrical circuits that involves the active electrical components such as vacuum tubes, transistors, diodes, integrated circuits, optoelectronics, and sensors, associated passive electrical components, and interconnection technologies. Commonly, electronic devices contain circuitry consisting primarily or exclusively of active semiconductors

supplemented with passive elements; such a circuit is described as an electronic circuit.

The science of electronics is considered to be a branch of physics and electrical engineering. The nonlinear behaviour of active components and their ability to control electron flows makes amplification of weak signals possible. Electronics is widely used in information processing, telecommunication, and signal processing. The ability of electronic devices to act as switches makes digital information processing possible. Interconnection technologies such circuit boards, electronics packaging technology, and other varied



# **Electronics In Biomedical and Instrumentation**

**by**  
**SK.NARESH**

**16BEI044**

The **Electronics In Biomedical and Instrumentation** provides the basics of electronics and electricity in advanced technical world linked with medical care. The advent of Electronics with Biotechnology promises an entire new class of devices like sensors and actuators (MEMS&NEMS) applied in diagnostics, biocompatibility, responsive drug delivery, self-assembly etc. The various applications include tests for emergency blood transfusions, blood grouping, samples from patients, or suspected heart attack.

The application of engineering techniques and principles in the medical field is nothing but a biomedical engineering. It closes the gap between engineering and medical and combines the problem and design solving skills of engineering with medical and biological sciences to

have a developed healthcare diagnosis.

The integrated subjects consist of anatomy, physiology, biochemistry and cell biology and mathematics is a main part of this course.

Pacemakers, Ultrasound Machine CAT, Medical diagnostic systems are the recent advances in medical field developed by the Electronics and Instrumentation Engineers.

The Biomedical Electronics Technology helps to develop the interpersonal skills required in medical personnel. There are many job opportunities available with hospitals, medical equipment companies, and other medical facilities. Biomedical engineering has an evolution from interdisciplinary specialization to considered field.



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HERE WE GO.....!



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HERE WE GO.....!!



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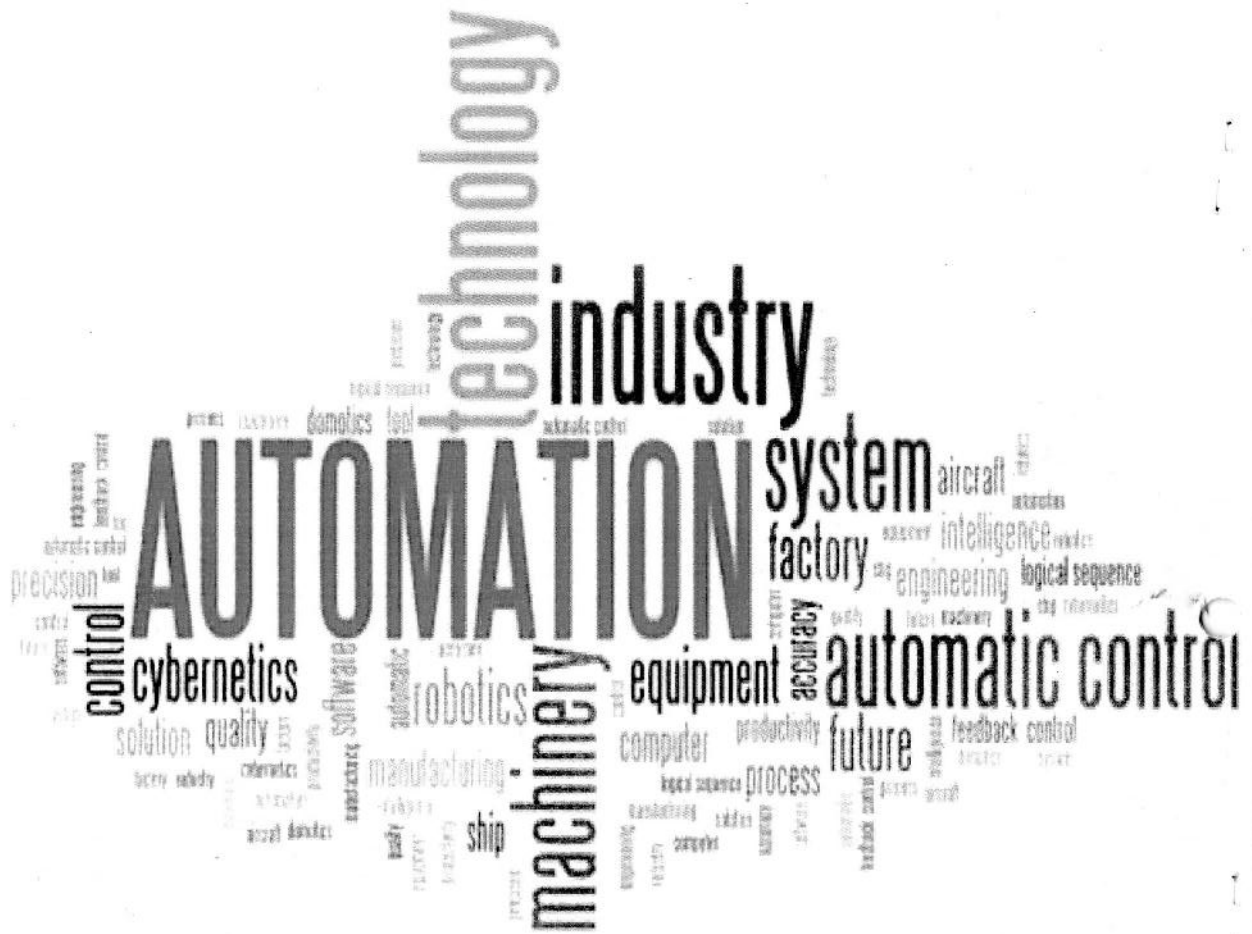
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HERE WE GO.....!



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"HUMAN'S FOOT IS A MASTERPIECE OF ENGINEERING AND A WORK OF ART"

