NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE
(NAAC Accredited)
(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)
Since 1968

DEPARTMENT OF MECHATRONICS

PRESENTS

ASIMOZ

2020-2021

MICROBOTS -MEDICAL APPLICATIONS

ACCIDENT RESISTANT SMARTBIKE

My Journey

Through The World of Competitive Robotics

ARTIFICIAL FEATHERS LET THIS ROBOTIC BIRD FLY WITH INCREDIBLE AGILITY

VOLUME 6 /ISSUE 1

NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE

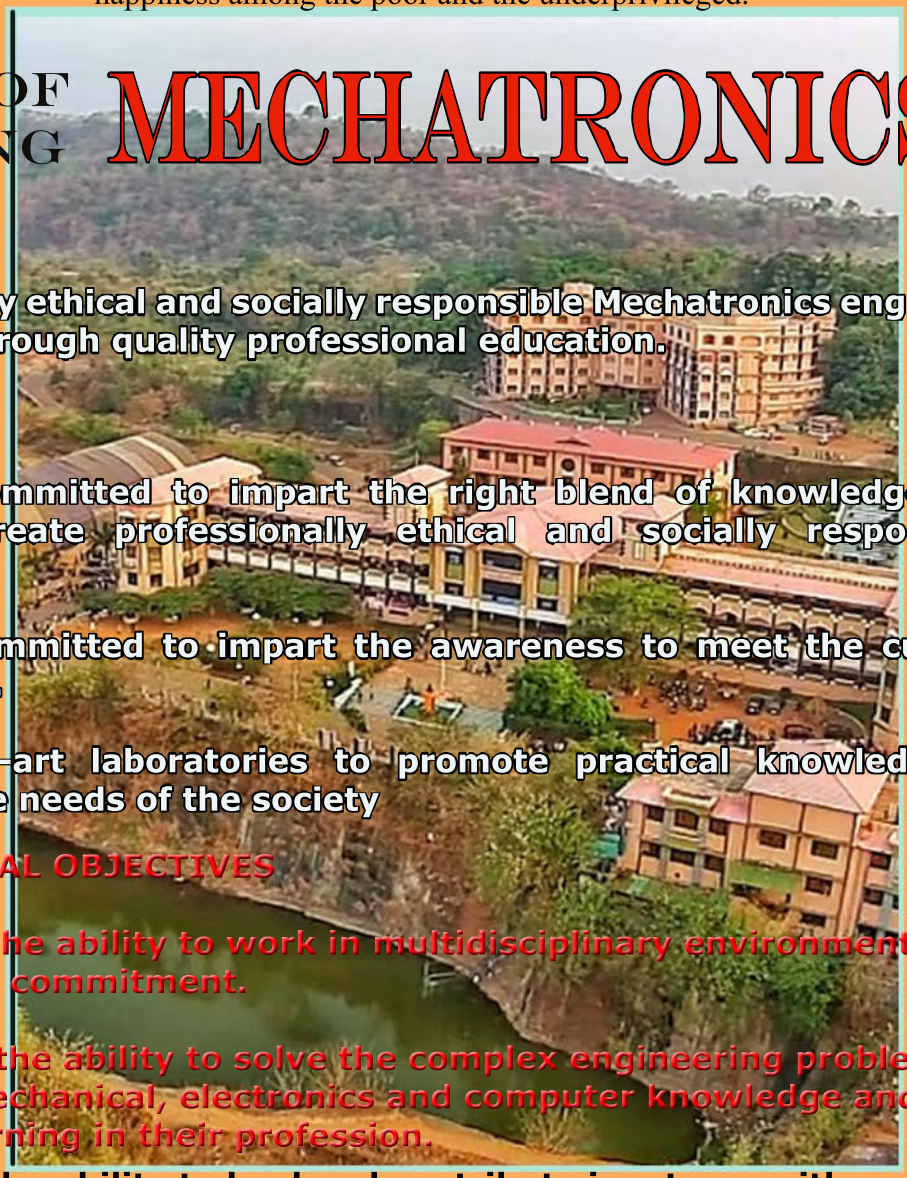
VISION OF THE INSTITUTION

To mould true citizens who are millennium leaders and catalysts of change through excellence in education

MISSION OF THE INSTITUTION

NCERC is committed to transform itself into a center of excellence in Learning and Research in Engineering and Frontier Technology and to impart quality education to mould technically competent citizens with moral integrity, social commitment and ethical values.
We intend to facilitate our students to assimilate the latest technological know-how and to imbibe discipline, culture and spiritually, and to mould them in to technological giants, dedicated research scientists and intellectual leaders of the country who can spread the beams of light and happiness among the poor and the underprivileged.

DEPARTMENT OF ENGINEERING MECHATRONICS



DEPARTMENT VISION

To develop professionally ethical and socially responsible Mechatronics engineers to serve the humanity through quality professional education.

DEPARTMNET MISSION

1) The department is committed to impart the right blend of knowledge and quality education to create professionally ethical and socially responsible graduates.

2) The department is committed to impart the awareness to meet the current challenges in technology.

3) Establish state-of-the-art laboratories to promote practical knowledge of mechatronics to meet the needs of the society

PROGRAMME EDUCATIONAL OBJECTIVES

I. Graduates shall have the ability to work in multidisciplinary environment with good professional and commitment.

II. Graduates shall have the ability to solve the complex engineering problems by applying electrical, mechanical, electronics and computer knowledge and engage in lifelong learning in their profession.

III. Graduates shall have the ability to lead and contribute in a team with entrepreneur skills, professional, social and ethical responsibilities.

IV. Graduates shall have ability to acquire scientific and engineering fundamentals necessary for higher studies and research.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

PEO1: Graduates shall have the ability to work in multidisciplinary environment with good professional and commitment.

PEO2: Graduates shall have the ability to solve the complex engineering problems by applying electrical, mechanical, electronics and computer knowledge and engage in lifelong learning in their profession.

PEO3: Graduates shall have the ability to lead and contribute in a team with entrepreneur skills, professional, social and ethical responsibilities.

PEO4: Graduates shall have ability to acquire scientific and engineering fundamentals necessary for higher studies and research.

Messages

Prof.Dr. Ambikadevi Amma.T
Principal
NCERC

“

I am pleased to send this goodwill to Mechatronics Department Magazine “ASIMOZ” which is published annually, I would like to appreciate the efforts taken by the students and staffs for the magazine and the magazine committee to publish the 6th edition of Department Magazine “ASIMOZ 2020-2021

”

“

AZIMOZ is an technical magazine giving free access to the students to express their innovative ideas and present technical articles.
Current trending technical know how are narrated as essays by our students to share the knowledge. It also gives them opportunity to convey their imaginations by their writings and paintings. Continuous efforts will lead them to implement their ideas as projects and make it into reality. ASIMOZ is the mind voice of young talented mechatronics buddies.

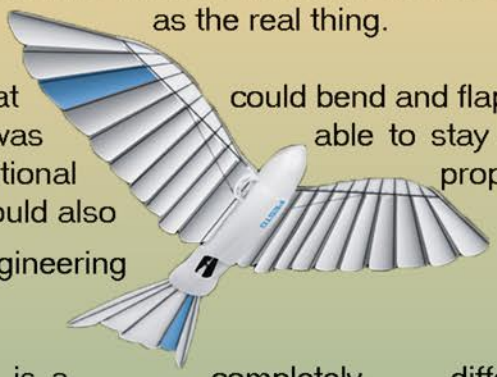
”

Prof.Dr.Bobby N D
Head of the Department
MECHATRONICS

ARTIFICIAL FEATHERS LET THIS ROBOTIC BIRD FLY WITH **INCREDIBLE AGILITY**

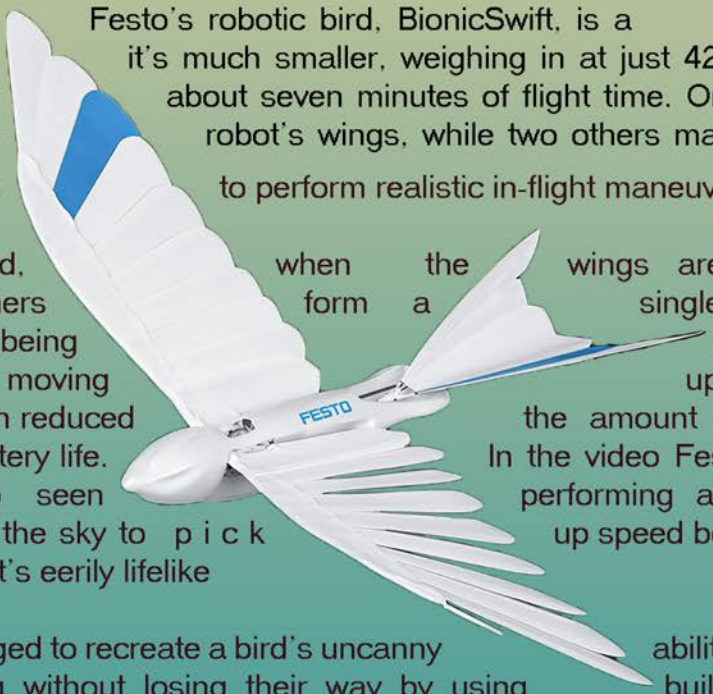
Amrutha S Nair
s4 - Mechatronics

Over the years, Festo, a German automation company with a penchant for robots, has designed countless Mother Nature-inspired automatons that swim, hop, and fly like their real-world counterparts. That includes robotic birds, which have now been upgraded with fake feathers that allow the robots to soar through the air with the same maneuverability and agility as the real thing.



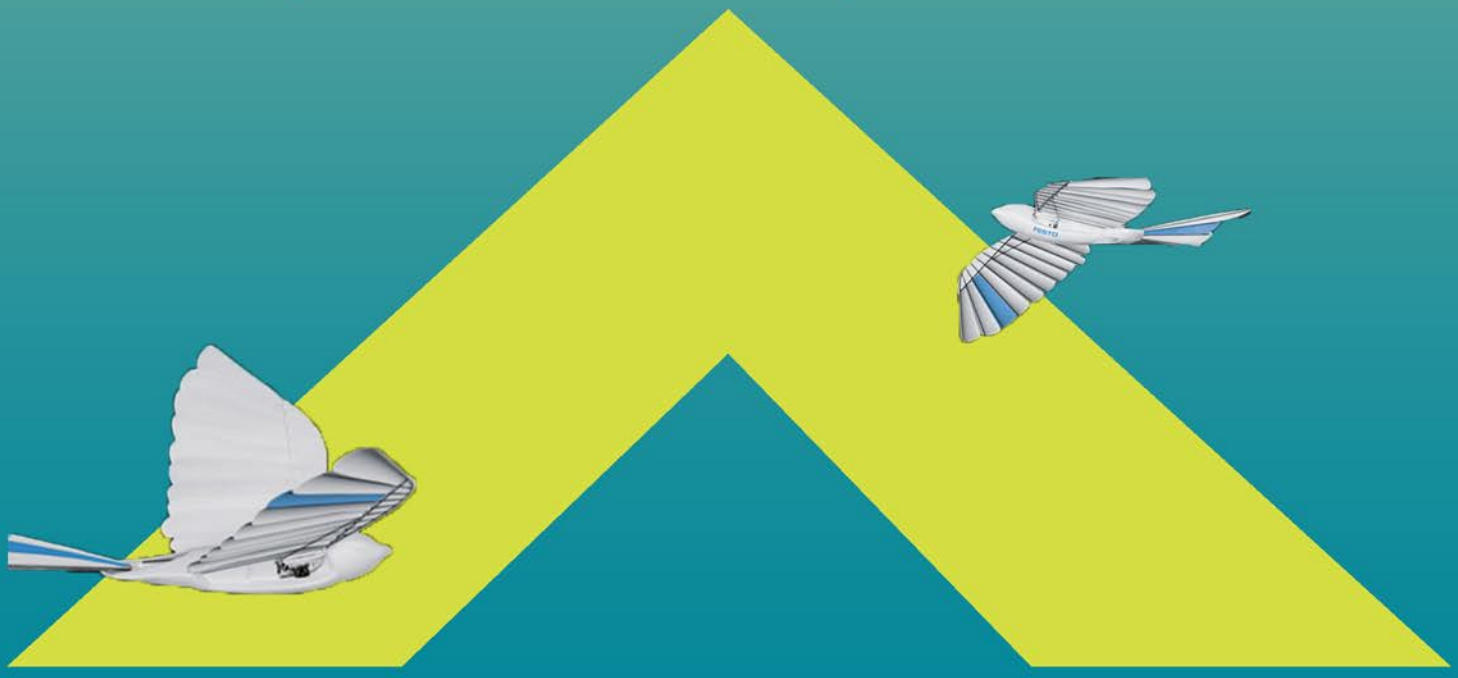
Nine years ago, Festo revealed a robotic seagull with wings that could bend and flap like the wings on the real-life terrors of the beach. The robotic bird was able to stay aloft by simply flapping its wings without the need for an additional propeller or other thrust mechanism to create forward momentum.. It could also steer by adjusting the angle of its tail, and while it was an engineering marvel, its in-air maneuverability was limited.

The latest version of Festo's robotic bird, BionicSwift, is a completely different story. For starters, it's much smaller, weighing in at just 42 grams while still carrying a battery that's good for about seven minutes of flight time. One electric motor powers the flapping motion of the robot's wings, while two others make adjustments to the bird's artificial foam feathers to perform realistic in-flight maneuvers.



As with a real bird, when the wings are moving downwards, the overlapping feathers form a single surface to maximize the amount of power being generated to create lift. When the wings are moving up, the feathers fan out to increase air flow which reduced the amount of energy needed for that motion, improving battery life. In the video Festo shared on YouTube, the robot bird is also seen performing a diving maneuver where it gracefully falls out of the sky to p i c k up speed before spreading its wings and climbing once again. It's eerily lifelike

Festo has even managed to recreate a bird's uncanny ability to fly half way around the world while migrating without losing their way by using built-in GPS so the robot knows where it is at all times. But with just seven minutes of flight time, the company doesn't have to worry about these escaping to South America when the weather gets cold.



ACCIDENT RESISTANT SMARTBIKE

Majid Bin Sulaiman
Syed Meeran Syed Kazmi
s2 - Mechatronics

ABOUT THE IDEA

This innovative idea is applicable in automotive industry. It can introduce the stakeholders to a new and innovative business model. In India, six two-wheeler riders die every hour in road accidents. Accidents can be reduced by a self-balancing smart bike. So, we can protect bikers and their families from accidents. Gyroscope is an existing technology in self-balancing two-wheelers. We can't implement a gyroscope in existing motorbikes because they take up some space. We can implement a gyroscope in an electric bike because we can use a hub motor in an electric bike. Self-balancing is the first step of making a bike smart. We need AI and machine learning to make it a self-driving motorcycle.

SELF-DRIVINGSYSTEM (AUTOPILOT)

We use cameras,sensors, radar system, a servo motor,speed controlling system, gyroscope controlling system, hub motor, interactive display, connectivity systems etc. and connect it to a software to support the self-driving system.

INTERACTIVE VIRTUAL INTERFACE

We will have to employ the use of an interactive virtual interface software which is created using AI and machine learning for making the motorcycle 'smart' and, for the autopilot system

ADVANTAGES

- **Maintains balance.**
- **Reduces chances of accidents.**
- **Saves the life of the rider and their bike.**

DISADVANTAGES

- **High initial production and sale cost. (High production cost can be overcome by using cheaper materials and, by reusing old parts.)**
- **High electricity consumption. (The high electricity consumption can be overcome by using a renewable energy source.)**
- **The systems may initially malfunction. (They can be perfected over a period of time after adequate research.)**

CONCLUSION

We can reduce all types of bike accidents and save lives. We can overcome common causes of bike accidents such as bad roads, drinking and driving, not wearing helmets, other human errors etc. It has the potential to revolutionize many industries such as automotive industry, software developing industry etc. and make the roads a lot safer for both commuters and pedestrians.

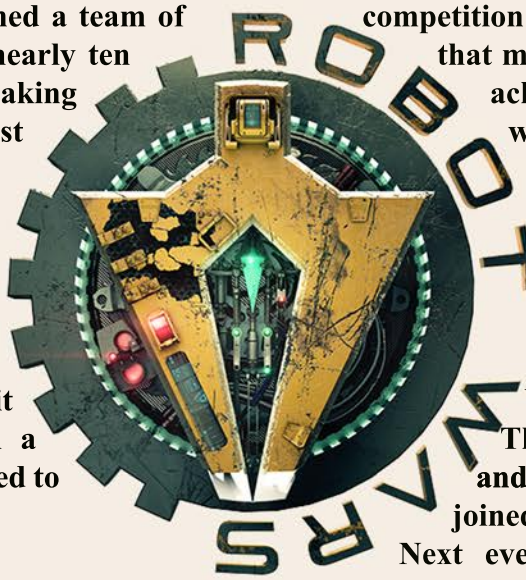
My Journey

Through The World of Competitive Robotics

NADIR NAZEER
S6-MECHATRONICS

We all come to any field as a beginner, in this field i was also a beginner with the experience of making and designing more than 50 plus robots for robotic events i had grabbed some extra knowledge from my journey of winning more than 30 to 40 robotic events in the state within 2 and half years.

First of all when i reached my college in the first academic year , i had heard about many robotic events happening in our state . I had no idea what is it. I just know about a tv series called battlebotz which was a show i used to watch in my childhood. When hearing robowar i thought of such kind of thing . Then i got attracted to these events , but cost of building such a robot was something beyond my capacity those days. So we formed a team of nearly 10 people and invested nearly ten thousand rupees and started making robot for robotic events. First event we came across was in nss palakkad , the event we participated was known as robo race . We read the guidelines of the events , and it was said that our robot should be in the dimension of 25 × 25 ×25 and it can be wired or wireless with a controller with it. Then we decided to participate in the event.



We referred many youtube videos and went through many circuits and finally we got the circuit of our first robot. Then we need the raw materials for making the bot. We had an investment of 10000 rs we bought parts and materials from the local city and assembled it. Our first robot worked perfectly well it was all tested good. Then we went for the event. We had participated in the event . Event was a time trail , which ever robot completes the lap in least time they would win . We took nearly 8 minute and 30 second to complete the lap. Winner of the event ,that guy completed the lap in just 35 second. Then we realised that our robot was a failure.

This failure never stopped us , so we try to overcome the failure , then we come to know about a evebt called robosoccer which was held at CET trivandrum.We checked the robots pecification.

There a team can consist of 2 robots . Problem we faced was we just have 4 motors which is just motors for making one robot. Then we decide to use 2 motor for each robot ,then we would be able to make 2 robots. Then we made our two robot and reached the event location in trivandrum. Robosoccer is an event where two teams of robot plays soccer and who ever with most number of goals wins the match. I remeber our first match at cet trivandrum .

Our robot was the lightest robot just weight around 300 grams . Maximum weight allowed is 7kg in the competition . How ever we one the first match , that moment was something big as of we achieved something . Next 2 matches we lose for a margin of 0-15 and 0-10 . This event was also a failure, but we studied the quality of the motors and quality of the gears . On the other hand there was a team from our college started by our seniors which was one of the best robotics team in the state. They had given an offer to join them and we would work together. We joined them and learned many things. Next event we participated was in our college techfest. It was robosoccer . In this event we designed a robot . We had a strong determination to have the best design we made the robot we used the best motor in the range. Motor name is johnson geared motor with a rpm of 300. I was the controller of the robot . I was a guy who lost last two events, but i practiced a lot , as a gamer from childhood i had some skills on me. I won the event in our college seccuring 7000 rs prize money.

Same robot we designed at that time was our teams flagship robosoccer robot which won prize in national level techfest in vjti mumbai. As my winning journey started from my college techfest which is continuing still with 30 plus prizes in robotic events.

For the people who need to know how to make a basic robot for events , i would say chose a motor , get 4 of them and check the torque and rpm ,if it is okay for our purpose then make a chassis and clamp the motors , and next find a medium of communication to the robot , it can be wired or wireless. If wireless dont try to go with Bluetooth, bluetooth is very slow response, so go with rf transmitter and reciever and have a good motor driver if wired use dpdt switch or push button switch. Push button switches are accurate and dpdt are less accurate but easy to make .With this details you can make your first robot for event.

For beginners i would like to say study the event details make the robot according to specification practice driving it create an emotion with the robot , it wont let you down , you can win any events. Failures are always stepping stones to success. We can learn something from failure .and dont let the same mistakes happen again .

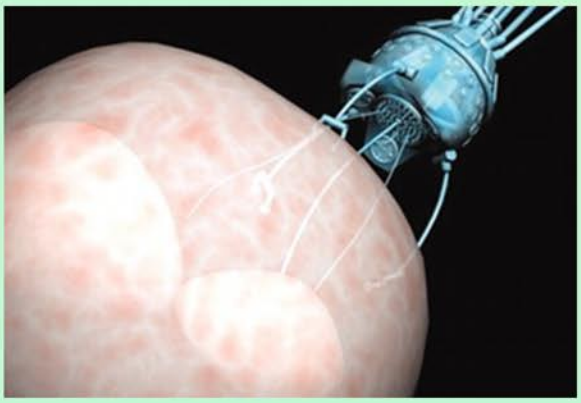
I would like to say all the best to everyone who gets inspired to make a competitive robot after reading this small article

MICROBOTS

JITHIN ANAND
S6 - MECHATRONICS

MEDICAL APPLICATIONS OF NANOTECHNOLOGY

The human body is made up of a maze of convoluted channels and tiny tunnels. The biological systems that keep blood, oxygen, and electrical impulses flowing are complex and precisely coordinated. So, when these systems fail,when our bodies are prone to malignancies and diseases, it appears at first that having medicine that can treat these problems would be great. Imagine cancer treatments that could transport medications directly to cancerous cells, rather of exposing the entire body to harsh chemotherapy medications. Consider ingesting a device that will scan your entire body for indicators of inflammation and sickness.



A world like this appears bizarre, conjuring up ideas of science fiction stories and children's literature. The potential of microscopic robots navigating the smallest passages of the human body, on the other hand, is not far off. In fact, significant progress has already been made toward the development and application of such nanotechnologies. These microbots, once completed, will allow doctors to investigate and treat patients' diseases with greater understanding and precision.

Early Phase through PillCam

The first step towards using nano-technology in medicine occurred in 2001, when Given Imaging introduced the PillCam. The PillCam is a capsule containing a light and camera that a patient swallows. Images beamed wirelessly from the capsule can be analyzed and used for diagnostic purposes, thus replacing procedures like the traditional endoscopy, in which a flexible tube containing a flashlight and camera is inserted into the digestive tract. The PillCam, at about the size of a normal pill, is ideal for use in the passageways of the gastrointestinal system since it can be swallowed. However, the digestive system is comprised of relatively large pathways compared to those of the arteries and capillaries, which can be as small as a few micrometers in diameter. The PillCam is thus still too large to travel through the entire circulatory system. Additionally, the device lacks a means of navigating itself through the body; it merely travels passively along the natural course of the digestive system.

To investigate pathways like those in the circulatory system, scientists needed to devise a way to make a tiny gadget that could drive itself against the bloodstream's flow. The scale of the technology required added to the task's difficulties. Any conventional battery-powered motor would be far too huge to fit through micrometer-sized openings

Devices for delivering drugs

Scientists have surmounted this challenge by propelling the devices with magnets rather than motors. Dr. Sylvain Martel, the creator and head of

de Montréal's have a NanoRobotics Laboratory, and his colleagues have produced microcarriers that can travel through larger arteries. The magnetic coils of an MRI machine guide thesemicrocarriers, which have effectively transported medications to rabbit livers.

Bacterial Microcarriers

Nature offers another answer to the problem of size. The magnetic MC-1 bacteria strain, discovered in 1993, propels itself with spinning tails. This strain is excellent for usage as drug microcarriers because, at 2 micrometres in diameter, it is small enough to navigate even the tiniest capillaries in our bodies and can be controlled with a modest magnetic field.

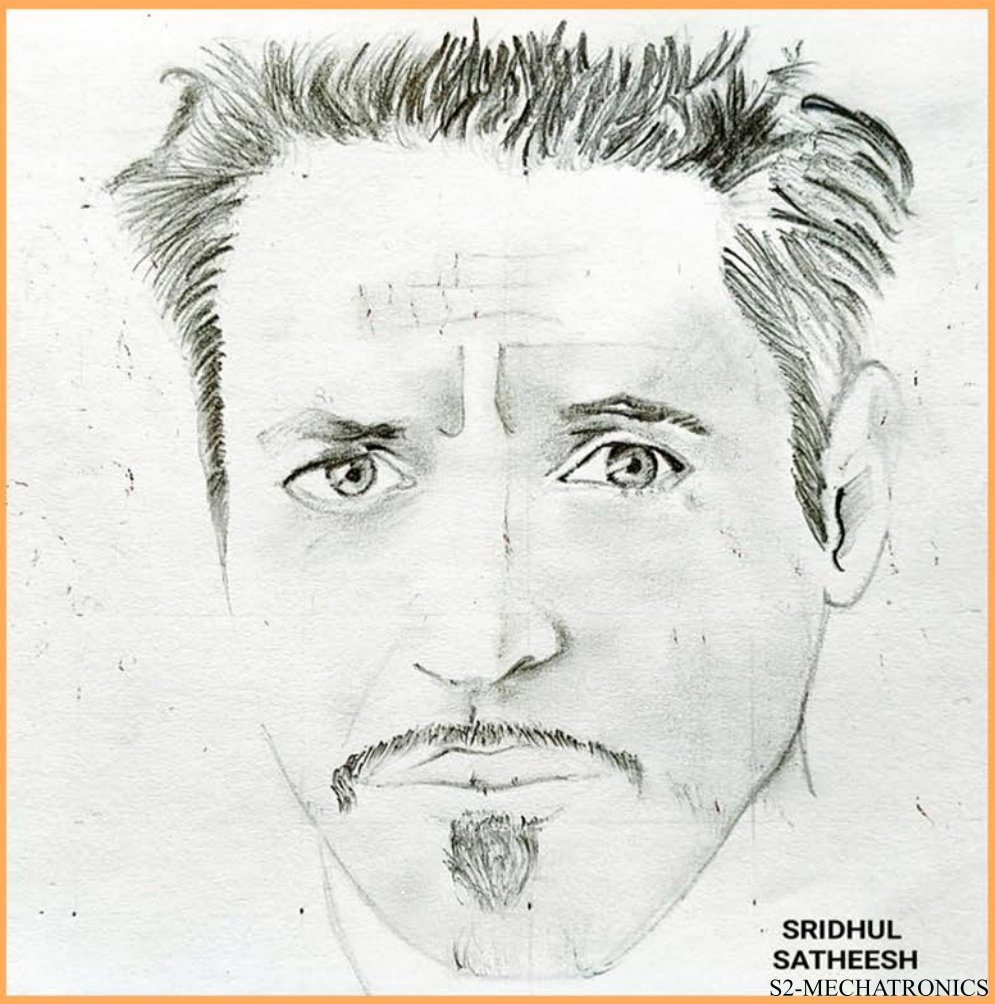
Despite the fact that this bacteria-driven special technology traverses more of the human body than its man-made counterpart, it is not without flaws. Most of the germs in Martel's trials, for example, never made it to the tumours. Because bacteria have a half-life of 30 to 40 minutes, many of them died before reaching the tumour. The powerful currents in the animals' larger vessels also caused many to be diverted.To this challenge, Martel proposes a hybrid approach. His team is currently investigating the use of man-made microbots to move drug-carrying bacteria into larger channels and closer to malignancies. The bacteria would then be released when the microbots were unable to move any farther through the small channels. Because the bacteria would be sent closer to the target in this situation, the aim is that they would have a better chance of reaching the tumour.

Diabetes Regulation

In addition to this treatment of cancer microbots are also being considered potentially useful for other medical purposes. For example, a team in Australia has proposed a concept and simulation using nanobots to regulate diabetes.

Diabetes patients have to test their blood multiple times daily to ensure that their glucose levels are stable.

students corner



NEHRU GROUP OF INSTITUTIONS
TAMILNADU • KERALA
ISO 14001 - 2004 CERTIFIED INSTITUTIONS

NCERC

NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE
(Accredited by NAAC)
Pampady, Thiruvilwamala, Thrissur (Dist) 680 588

Hearty Congratulations

B. Tech University Rank Holders

FIRST RANK

ADITH SUNDER C
NCE16MC002

SECOND RANK

JITHIN T J
NCE16MC023

DEPARTMENT OF
MECHATRONICS

EDITORIAL BOARD

STAFF EDITOR
MR. Ranjith P N
Assistant Professor

STUDENT EDITOR
Mr. Anas Mohammed
S8- Mechatronics

DESIGNED BY
Mr. Arun Jose
Assistant professor