

<Inspire>

Newsletter

Department of Information Science & Engineering



Volume 1

June 2017

VISION AND MISSION OF THE INSTITUTE

Vision

- To be one of the premier Institutes of Engineering and Management education in the country.

Mission

- To provide Engineering and Management Education that meets the needs of human resources in the country
- To develop leadership qualities, team spirit and concern for environment in students

VISION AND MISSION OF THE DEPARTMENT

Vision

- To be a premier department of learning in information Science and Engineering under Visvesvaraya Technological University, molding students into professional Engineers

Mission

- Provide teaching-learning process that develops core competencies in Information Science and Engineering to meet the needs of the industry and higher education.
- Create an environment for innovative thinking and self learning to address the challenges of changing technology.
- Provide an environment to build team spirit and leadership qualities to succeed in professional career.
- Empathize with the societal needs and environmental concerns in Information Science and Engineering practices.



Elon Reeve Musk

Born in South Africa in 1971, Elon Musk became a multimillionaire in his late 20s when he sold his start-up company, Zip2, to a division of Compaq Computers. He achieved more success by founding X.com in 1999, SpaceX in 2002 and Tesla Motors in 2003. Musk made headlines in May 2012, when SpaceX launched a rocket that would send the first commercial vehicle to the International Space Station.

Contents

- Robo Bees
- Robotic Surgery
- Cloud Robot
- Robonauts
- And More..



B.N.M Institute of Technology

Affiliated to V.T.U. Belgaum | Approved by A.I.C.T.E., New Delhi

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MESSAGE FROM THE EDITORIAL TEAM

We present to you, the third edition of the ISE newsletter, created completely by the students. We have taken opportunity to express our ideas, be creative and design our very own newsletter.

We hope you get to learn about, experience and share your thoughts about the new technologies explored by the writers and editors of this edition and that you enjoy what we have put, the theme for this year's edition is '*Robotics*'

About Our Department

The Department of Information Science and Engineering at BNMIT started in the year 2001 with an intake of 60 students. The Department has a diverse community of faculty engaged in all aspects of research, teaching and mentoring of students. Students from ISE are multifaceted having come up with innovative projects, giving stellar performances on the sports field and bringing back trophies. Students are encouraged to develop projects from many field of interests like Image Processing, Knowledge Networks, Embedded systems with IoT, Networking which give way to a holistic development. Many students have taken up internships in reputed organisations to gain first hand experience of corporate environment. The Department conducts workshops, Seminars, FDPs regularly every semester.

BNM Institute of Technology is one among 16 engineering colleges in Karnataka to be ranked 100 - 150 by National Institute Ranking Framework (NIRF), Ministry of Human Resource Development, New Delhi, for the year 2017.



Shri. Narayan Rao R. Maanay, receiving **Best Educationist Award of The Hindu Newspaper** from Honourable Higher Education Minister of Karnataka **Sri. Basavaraj Rayareddi** in the presence of **Dr. M.P. Poonia**, Vice-Chairman, AICTE and **Dr. M.S. Shamasundar**, Advisor, NAAC at Bangalore on 26.03.2017.

“Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time.” - Thomas A. Edison

**DID YOU
KNOW?**

Robot comes from the Czech word “robota” which means “forced work or labor.”



RoboBees - A Boon for the Planet

With the bee population dwindling around the world and roughly three quarters of the world’s flowering plants and 35 percent of the world's food crops depending on animals to pollinate them, the Japanese researchers have come up with a novel solution—robots that pick up and deposit pollen. The scientists use a special gel called ionic liquid gel a mixture of complex molecules connected by long chains. Upon putting gel droplets on the backs of ants and leaving insects overnight in a box full of tulips, it was found that the ants with the gel had picked up far more pollen grains than those without it.

It was possible to integrate photo-chromic compounds that could act as an adaptive camouflage to protect pollinators from predator. Although the experiment was conducted on only one type of flower and a lot of practice is required to control the drones, the experiment shows promise to counter the problem of bee decline with GPS and artificial intelligence automatically guiding robotic pollinators one day. Even the cost remains an issue and the number of robot pollinators required would be mind-boggling. Real bees avoid all these problems. Efforts are being made to alleviate the pressure on bees such as better management of bees through fewer pesticides, breeding crops that self-pollinate and use of spraying machines to scatter the pollens over the crops. Let us learn to look after them and not plan their downfall.



**Thanusha S P
VI ISE**

Faculty Development Programme



The department of Information Science and Engineering organized a one week faculty development programme on “Artificial Intelligence and its Applications” during January 9th, 2017 to January 13th, 2017.

“Give me but a firm spot on which to stand and I shall move the earth.”

-Archimedes

Robotic Surgery

Robotic surgery is a type of minimally invasive surgery. “Minimally invasive” means that instead of operating on patients through large incisions, miniaturized surgical instruments are used. These instruments fit through a series of quarter-inch incisions. The surgeon controls these instruments and the camera from a console located in the operating room. On placing the surgeon's fingers into the master controls the surgeon is able to operate all four arms of the da Vinci simultaneously while looking through a stereoscopic high-definition monitor that literally places him inside the patient, giving him a better, more detailed 3-D view of the operating site than the human eye can provide. Every movement the surgeon makes with the master controls is replicated precisely by the robot. When necessary, the surgeon can even change the scale of the robot's movements: If he selects a three-to-one scale, the tip of the robot's arm will move just one inch for every three inches the surgeon's hand moves. And because of the console's design the surgeon's eyes and hands are always perfectly aligned with his view of the surgical site, minimizing surgeon fatigue. Surgical robots have the ability to make decisions and take independent action more often than the patient might realize. In surgery for vision correction, a robotic system cuts a flap in the patient's cornea and plots out the series of laser pulses to reshape its inner layer. In knee replacements, autonomous robots cut through bone with greater accuracy than human surgeons. At expensive clinics for hair transplants, a smart robot identifies robust hair follicles on the patient's head, harvests them, and then prepares the bald spot for the implants by poking tiny holes in the scalp in a precise pattern sparing the doctor many hours of repetitive labor.

The da Vinci Surgical Method

The da Vinci Surgical System is a robotic surgical system made by the American Company Intuitive Surgical. It was approved by the Food and Drug Administration (FDA) in 2000.

The da Vinci Surgical System, surgeons operate through just a few small incisions. The da Vinci System features a magnified 3D high-definition vision system and tiny wristed instruments that bend and rotate far greater than the human hand. As a result, da Vinci enables the surgeon to operate with enhanced vision, precision and control. The da Vinci Si has two separate but connected sections : the tower and the console. The tower is positioned directly over the patient during surgery which contains the robot's four arms. The console is where the surgeon sits and operates the robot's controls.

There are also risks involved in robotic surgeries. Surgery using the da Vinci robotic surgical system may be associated with longer operative and anesthesia times. As with any surgical device, there is also the risk that the da Vinci robotic surgical system could malfunction or fail leading to serious injury or the need to switch to another type of surgical approach. Switching to another surgical approach could also result in a longer procedure time, a longer time under anesthesia and increased complications.

Advantages of Robotic Surgery

- Shorter hospitalization
- Reduced pain and discomfort
- Faster recovery time and return to normal activities
- Smaller incisions, resulting in reduced risk of infection
- Reduced blood loss and transfusions
- Minimal scarring

Applications of da Vinci Surgical Method

- Cardiac Surgery
- Colorectal Surgery
- General Surgery
- Gynecologic Surgery
- Head & Neck Surgery
- Thoracic Surgery
- Urologic Surgery

Shreyas.S.A
VIII ISE

“Lets go invent tomorrow instead of worrying about what happened yesterday”.

- Steve Jobs

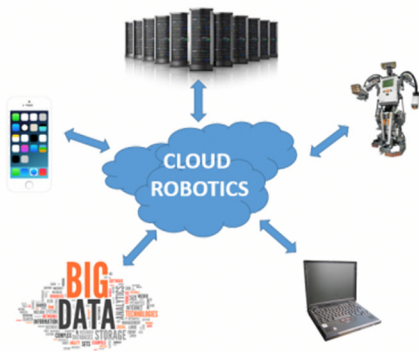
CLOUD ROBOTICS

Cloud Robotics and Automation is a new concept that taps into cloud computing, cloud storage and IoT. When computational or storage demands exceed the on-board capacity of a robot, they can be offloaded to the cloud, where the massive resources of a data centre can supplement their limited local resources.

Google's self-driving car uses cloud computing. RoboBrain, Rapyuta, MyRobots and RoboEarth are some frameworks under which the robots can be interconnected and these perform heavy computations.

SOME MORE CLOUD ROBOTICS PROJECTS

- Singapore's ASORO (A *Star Social Robotics Lab) researchers have built a cloud computing infrastructure to generate 3D model of environment that allows robots to perform localization and mapping operations or SLAM.
- At LAAS (Laboratory for Analysis and Architecture of Systems), researchers are working making manipulation tasks easier by breaking them down into simpler chunks.
- A French robotics firm, Gostai, has built a cloud network called 'GostaiNet' which performs speech recognition, face detection and other tasks remotely.
- iCub: It doesn't contain the conventional Cloud robotics database but instead works as a "container of behaviours". Although there are still many problems that have to be dealt with before Cloud Robotics goes mainstream, it does have thought-provoking, inspiring potential and can have a significant yet positive impact on the future.



NAGASHREE H S
VI ISE

CSI EVENTS

• Two days workshop on "Ruby on Rails" Organised by Aniruddha SG, co-founder and trainer at Design Code Test Academy for 6th semester students on 23rd March, 2017 and 24th March, 2017 also on 30th March, 2017 and 31st March, 2017.

• Two days workshop on "ARM 7" Organised by Mr Sanjay Kumar from Embedded Labs for 4th semester students on 7th April, 2017 and 8th April, 2017.

"A robot may not injure a human being, or through inaction, allow a human being to come to harm." - Isaac Asimov

ROBOTS IN SPACE—ROBONAUTS

Just like C3PO from Star Wars and Data from Star Trek, Robonauts are humanoid robots, developed by NASA, at Dextrous Robotics Laboratory in Houston. Although robotic arms, cranes and rovers are employed in space explorations, Robonauts are different as their tasks require more handiness and dexterity. NASA first began working on Robonauts in 1996 to help astronauts with potentially dangerous or mundane tasks. The first generation Robonaut, designed by NASA's Robot Systems Technology with DARPA, was never flown to space but was designed for extra-vehicular activities (EVA) on the planetary/lunar surfaces. It had hands or a manipulator to grasp and manoeuvre objects and two-wheeled or four-wheeled platform for locomotion.

R2, developed by NASA and General Motors, is a state-of-the-art highly dextrous robot that can handle EVA tools and interfaces just like R1 but is four times faster and compact, with a wider range of sensing. Although it was designed as a prototype, on February 24th 2011, NASA launched the human-like robot to ISS. While upgrades for R2 are being prepared on Earth, the Robonaut is being tested in microgravity and subjected to the station's radiation and electromagnetic interferences.

Nagashree H S
VI ISE

Robot can be controlled by human thought

Telepathy is one of the most powerful psychic abilities. It is known as mind to mind communication, which are feelings exchanged between a sender and a receiver. After believing, and meditating for a few minutes, it then becomes really easy to transmit a message. While some people think this can only be accomplished by a professional, it can in fact be done by even the most inexperienced personalities.

The latest creation is a robot being controlled by telepathy. The mind control robot responds to commands that are triggered by thinking. The robot, designed by researchers at MIT's Computer Science and Artificial Intelligence Laboratory, can understand signals from a human connected to an ECG machine and respond to negative signals regarding its actions. The robot, called Baxter, is used to sort objects into two categories, paint and wire, with instruction from a human's brain. It chose to place objects into the two boxes, but changed its mind when it received feedback from the connected human that it was doing something wrong. The robot is connected to the user via the ECG machine hence a negative thought from the human triggers an almost instantaneous reaction. The only task of the user is to either agree or disagree with what the robot had done. The machine adapts to your thought. There is no separate way of thinking that influences the robot. The researchers hope the thought-control technology could be applied to a range of robotics, including manufacturing robots and self-driving cars. It could also be used to control prosthetic limbs or in communication tools. Imagine being able to instantaneously tell a robot to do certain actions without needing to type a command, push a button or even say a word.

The system also includes the ability for the robot to ask a human for advice if it's unsure about its decision. This becomes a boon for people who are paralyzed or are handicapped. Translating human language to meaningful robotic signals can be difficult but this approach has a bright future ahead.

Srividya .V
VIII ISE

THE PATH FOLLOWER ROBOT

One of man's greatest inventions would be the robot. What is a robot? To put it in simple terms, a robot as an automated version of a human being, we feed it with programs, and it performs the tasks as defined in the programs. The reason for the upsurge in the field of robotics is that everything in the present generation is being dealt with automation.

Undoubtedly, robots are much more efficient than human beings in terms of doing work. A decision was taken to work on a simple project that dealt with making a miniature version of a robot. The project made use of an ATMEL microcontroller, and many other ICs to drive the motors, to convert the analog output from the sensor to digital data input which is given to the microcontroller. The working of this robot is very simple - 2 IR sensors were used to detect the path on which the robot is traveling. Whenever the IR sensor detects a black path, it sends a low output to the microcontroller, and whenever there is a white surface detected, the IR sense sends a high output to the microcontroller. How would this benefit the humans? Consider a physically challenged person who cannot walk around. If he/she were to stay alone in a house, all that the person has to do is install a path at home and make use of a few robots to move around the house. If one could develop an app to communicate with the robot, with the simple touch of any Option on the app, it would translate to an action to be performed by the robot and one could get his/her tasks done through the robots, without much effort.

Another useful application of the path follower robot would be implementing the concept of Internet Of Things (IOT) to this. It makes use of a Raspberry Pi board, to which a DHTII sensor can be attached which can sense the temperature and humidity conditions of the surroundings of the robot. When this setup is incorporated with the robot, the robot can be made to move around in a particular environment, fetch the readings using the Raspberry Pi board, and alert the user by sending a mail using Simple Message Transfer Protocol (SMTP).

J Shesha Shankar
VI ISE

Association of Computer Science & Information Science



What I Wish My Seniors Told Me

The seminar was conducted by three alumni namely Mr. Sriram, Mr. Shrisha Kumar and Ms. Dharti Kashyap. The three of them interacted with the students. They informed them of the various options available for higher studies in India and abroad.



Seminar by KnightsRoboCorp

The demo class was conducted by Mr. Partha Sharma who is the founder and CEO of KnightsRoboCorp. Mr. Partha is a Mechatronics Engineering graduate who felt the lure of Robotics and technology early on.



Seminar on Need for Internship

The 8th semester students Ms. Vidya Murthy, Mr. Shrey Arora and Mr. Ananth Vishnu addressed their juniors on the need to take up internships. They highlighted the benefits of undergoing internships.

" We are changing the world with technology" - Bill Gates

Student Achievements

- Akshatha R, Harshita Mangly M, Pavani N and Prathyusha Ayyagari won Best Project award for their project “Energy – Aware reliable routing in wireless ad-hoc networks” for the year 2016-2017.
- Sarayu.S, Samhita Kanthaval, Srividya V and Saniya Simeen won Best Project award for their project “Implementation of a secure private cloud” for the year 2016-2017.
- Srividya V won Best Presentation award for the project “Implementation of a secure private cloud” for the year 2016-2017.
- Harshita Mangly M won Best Presentation award for the project “Energy – Aware reliable routing in wireless ad-hoc networks” for the year 2016-2017.
- Aaditya Sharma won Best Presentation award for the project “Biomedical Literature Mining Using Concept Graph” for the year 2016-2017.
- Abhishek Harsh, Chetan Shukla, Aditya Ambashth and Preet Sharma won prize for their IPL Project “*Netraheen Helper (An advanced Blind Stick)*”- The project is about the stick that helps the blind to navigate. It can detect fire as well as water.
- Pallavi V Rao of 8th semester ISE is the Sports Ambassador of the year 2016-2017.
- Anusha V of 8th semester ISE is the Best Outgoing Student of the year 2016-2017.
- Shrey Arora of 8th semester ISE completed one month Internship in Customised Technologies pvt ltd.
- Vidya Murthy of 8th semester ISE carried out internship in Mercedes-Benz and worked with ITM/CG department on the topic “Understanding of Cyber Security at an Automotive Company ” Feb 2016.
- Nagashree of 6th semester ISE, won second place in English Essay writing Uttishta 2017 BNMIT. She also participated and got scholarship “Crypt-o-rig” 2016 Gate Academy.
- Preeth Sharma and his team of 6th semester ISE, won first prize in Treasure hunt, TATVA 2017
- Akhila P of 4th semester ISE, a Student Entrepreneur, Co-founder of EMBER.
- Prathyusha Ayyagari of 8th semester ISE, participated in IET Tech Presentation conducted in BNMIT on 12th May, 2017 and is selected for the next round.
- Abhiram V participated at the “Swachh Bharat Short Film Festival Competition” organized by Ministry of Information and Broadcasting and NFDC Ltd.

Sudoku Mania

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EDITORIAL TEAM

FACULTY

Mrs.Christy Persya A | Associate Professor, ISE
Mrs.Basavarajeshwari | Assistant Professor, ISE
Mr. Rohith Vaidya K | Assistant Professor, ISE

STUDENTS

Nikhil S.V | 8th semester
Shrey Arora | 8th semester
Vidya Murthy | 8th semester
Sanchitha Thanay | 6th semester

Sai Navaneeth V | 6th semester
Mayur L.S | 6th semester
Kailasa Aravind | 6th semester
Thanusha S P | 6th semester
Ron Astle Lobo | 6th semester

You can email us your queries and opinions at: isenewsletter2017@gmail.com

“Science does not know its debt to imagination” - Ralph Waldo Emerson