EDITION 1

SPRING SEMESTER 2014

SCRIPTURE

PREMIER E-MAGAZINE OF THE SCHOOL OF ENGINEERING, TEZPUR UNIVERSITY

FEATURED

EFFICYCLE 2013 THE EXPEDITION

THE DEVELOPMENT OF BIOMIMETIC PROSTHETIC HAND

THE INTERNET OF THINGS

WEARABLE TECHNOLOGIES

- TRIVIA CORNER
- ENGINEERING IN MOTION
- CODING CORNER
- INTERNSHIP EXPERIENCE

FROM THE FACULTY IN-CHARGE

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"Best Wishes"

It is my pleasure to announce the launch of the first edition of " Scripture – e-magazine of SOE ". It provides a platform to exhibit technological ingenuity of both students and faculty members and hence it is regarded as a treasure trove. The E-magazine also showcases the achievements as well as the research and developments of the school of engineering community in various domains. One of its motives is to keep the students abreast of the departmental projects, internships and the placements for which there is a definite informative section from the experienced students, thereby giving a proper lead to the current batches of students. Besides it also focuses on some of the important events and upcoming activities of the school.

It is needless to mention any such endeavor entails enormous amount of sincerity and hard work. And to this end I should like to congratulate the Editor and his team members for this tireless job done so beautifully. I wish "Scripture" all success for times to come.

– Ms. Ananya Bonjyotsna
Faculty-In Charge

FROM THE EDITOR

Dear Readers,

It gives us immense pleasure in acquainting you with the First Edition of Technical Magazine of School of Engineering, Tezpur University "SCRIPTURE". It has been an uphill work and a patient long wait (almost two years now) to turn this idea into reality. And I must say all those long nights were not spent in vain .The first Edition of the magazine is all set to make a dent in the space-time with its refreshing look and innovative ideas. This time the main aim was to encourage students to come out with creative and innovative ideas and contribute articles related to their fields which are difficult to find on the internet. So we focused on articles based on original work, catalysing the process of constructive thinking amongst our students. Also scripture has started as an unconventional endeavour to connect the Students and Faculty of their respective departments, giving them knowledge about the various activities being carried out in and around SoE along with the new trends in their respective engineering fields. Team Scripture takes an immense pride in initiating this step.

This edition of Scripture highlights and features wide range of articles including Fact zones , Fun stuffs along with indispensable Technical contribution .We have laid huge emphasis on the designing and presentation of our articles making them appeal to our readers. They are based upon original work done by our students and Faculty members namely' Teacher Student ratio', 'Internet of Things' and 'Passive Vibration Control of Structural System'. We also introduce a special section of 'Eminent Personalities' featuring people who made ground-breaking contribution to the field of technology along with some of the interesting facts in 'Fact zone' which will keep you pondering. When it comes to placements and internships, a good advice is what you always seek for. This 'Scripture' dedicates a complete section for the same. Along with these articles we have tried to cover selected activities and Internship experiences.

Finally I would like to thank' the authors of all the articles and the entire Scripture team (specially , The First year Editing team) without whom this abstract idea would not have taken a concrete form and would like to congratulate them for their innovative designing and presentation work and sincerely hope that they carry forward the legacy. Hope you will like the magazine. We are eagerly looking forward to your feedback which will help us improve further.

- Puneet Sharma
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WE THANK ALL THE STUDENTS AND FACULTY MEMBERS FOR CONTRIBUTING ARTICLES FOR OUR MAGAZINE

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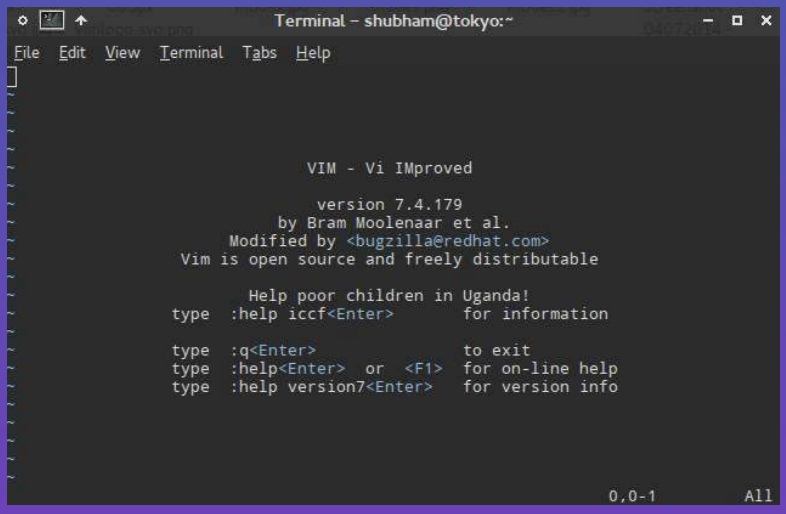

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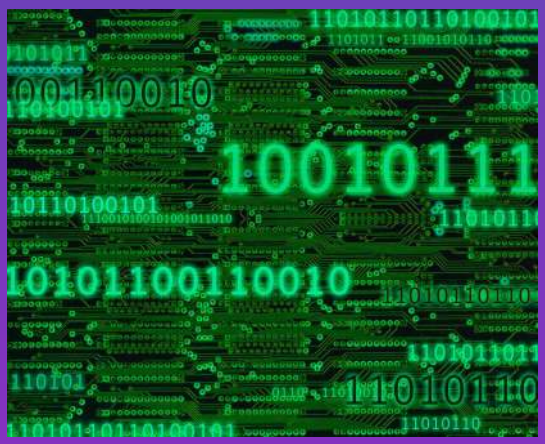

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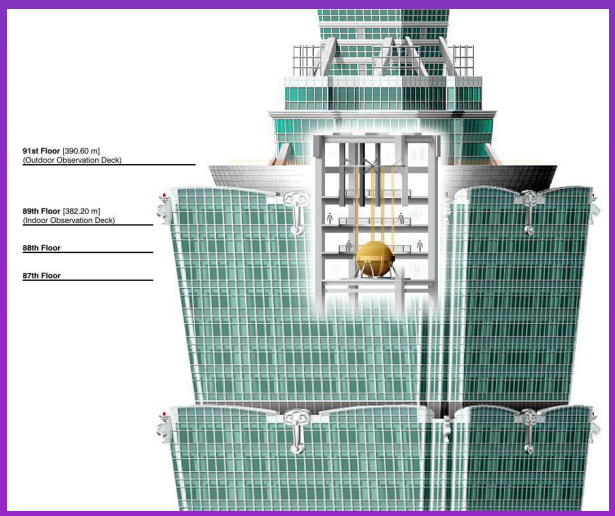

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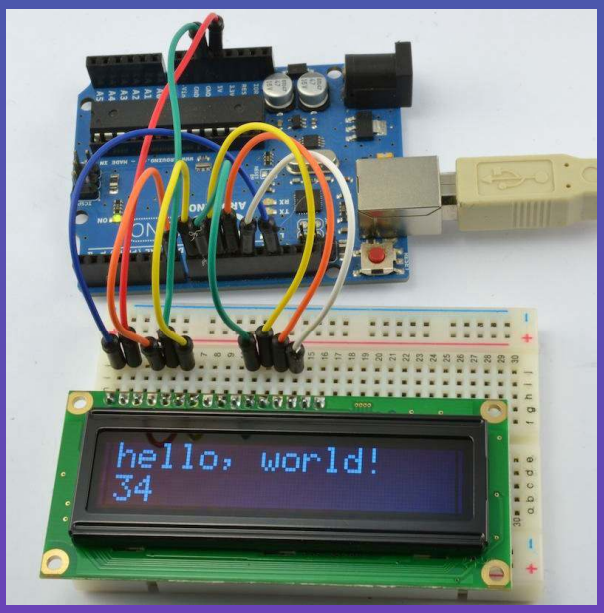

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THE DEVELOPMENT OF BIOMIMETIC PROSTHETIC HAND

PROTOTYPE 1.0

OVERVIEW OF THE DESIGN AND DEVELOPMENT OF A COST-EFFECTIVE BIO-SIGNALS CONTROLLED PROSTHETIC HAND.

DR. SHYAMANTA M. HAZARIKA

PROFESSOR AND HEAD
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Multi—fingered hand prosthesis using surface electromyogram (EMG) signals has appeared in the market. Nevertheless, it seems EMG based control is still rudimentary; being limited to a few hand postures or a simple proportional estimate of force. Moreover, control is non—intuitive, in the sense that the user is required to learn to associate muscle remnant actions to unrelated postures of the prosthesis.

EMG based grasp classification holds promise for development of an embedded intelligent controller. Further, sophisticated multi—fingered hand prosthesis that has appeared in the market is exorbitantly priced and out of reach of the common people. This is particularly true for developing countries like India. Here in lies the motivation for development of a cost-effective prosthetic hand.

Two key requirements of such a system are: a. ability to replicate as closely as possible the form and function of the limb being replaced and b. fast, intuitive, bidirectional interface between the biological and mechatronic system. I will discuss work undertaken at Tezpur University in the pursuit of this goal.

Our focus is on reproducing human grasping operations using non-invasive EMG through extreme upper limb prosthesis for people with manipulative disabilities. We have undertaken study of human grasping strategies to understand cognitive underpinnings of constructing grasps with little or no effort during our everyday interaction with the physical world.

Six grasp rypes have been identified as sufficient for evolving grasping strategies in daily living activities. Using a combination of innovative signal processing and advanced machine learning algorithms, a recognition rate of 97.5% for classification of six grasp types (used during 70% of daily living activities) based on two channel forearm surface EMG has been obtained.

THE FINAL PROTOTYPE SHOWING OFF IT'S GRASPING ABILITY

Following a biomimetic approach, through careful investigation of human hand physiology and biomechanics of extreme upper limb, we have developed a cost-effective EMG controlled bionic hand. The prosthetic hand acts as an integral part of the body. Position and orientation of the fingers vis—a—vis the object to be grasped is expected to be achieved by the subject wearing the prostheses. Grasp required for a particular object is supposed to be known a priori. Grasp synthesis for Prototype 1.0 is reduced to recognition of the EMG pattern and the control electronics activating the required actuators. Six grasps types referred to above are the primitive ‘grasps’ Prototype 1.0 can execute.

BUILDING THE FUTURE FROM ASHES OF THE PRESENT

FLY ASH

DEBANKUR BARUAH 2ND SEM CIVIL ENGINEERING

ONE MIGHT BE WONDERING WHAT IS “FLY ASH”? WELL, DON’T GO MUCH BY THE LITERAL MEANING OF IT.

FLY ASH ARE PARTICLES WHICH CLOSELY RESEMBLES THE VOLCANIC ASHES. THEY ARE GENERALLY SPHERICAL IN SHAPE AND RANGE IN SIZE FROM 0.5 μM TO 300 μM. TODAY FLY ASH COMES PRIMARILY FROM COAL-FIRED ELECTRICITY GENERATING POWER PLANTS.

IN INDIA THERE ARE ABOUT 80 THERMAL POWER FACILITIES WHICH GENERATE LARGE QUANTITIES OF FLY ASH BY BURNING BITUMINOUS COAL. THESE ASH PARTICLES CONSIST OF SILICA, ALUMINA, OXIDES OF IRON, CALCIUM, AND MAGNESIUM AND TOXIC HEAVY METALS LIKE LEAD, ARSENIC, COBALT, AND COPPER. THIS POSES PROBLEMS IN THE FORM OF LAND USE, HEALTH HAZARDS, AND ENVIRONMENTAL DANGERS.

THE REAL PROBLEM

SURFACES AT THE TIME OF THEIR DISPOSAL. IN ORDER TO PREVENT THE FLY ASH FROM GETTING AIRBORNE, THE DUMPING SITES HAVE TO BE CONSTANTLY KEPT WET BY SPRINKLING WATER OVER THE AREA. THE COAL INDUSTRY IN USA SPENDS MILLIONS OF DOLLARS ON LINING FLY ASH DUMPING GROUNDS. BUT IN INDIA, THESE SITES ARE NOT LINED WHICH LEADS TO SEEPAGE, CONTAMINATING GROUND WATER AND SOIL. THUS TACKLING THE PROBLEM NEEDS SERIOUS CONSIDERATION. FLY ASH MANAGEMENT HAS TAKEN CONSIDERABLE STRIDES OVER THE PAST FEW YEARS. RESEARCHERS HAVE BEEN ATTEMPTING TO CONVERT THIS WASTE INTO RESOURCE BY EXPLORING VIABLE AVENUES FOR FLY ASH MANAGEMENT. FLY ASH IS OXIDERICHAND CAN BE USED AS THE RAW MATERIAL FOR DIFFERENT INDUSTRIES. ONE SUCH USE OF FLY ASH IS IN THE MANUFACTURING OF BRICKS AND OTHER BUILDING MATERIALS.

SOME OF THE MAJOR CONSTRUCTIONS HAVE BEEN CARRIED OUT USING THESE MATERIALS RECENTLY. IN INDIA, USE OF FLY ASH AS A PART REPLACEMENT OF CEMENT IN MORTAR AND CONCRETE HAS STARTED WITH IIT-DELHI TAKING THE LEAD. USE OF FLY ASH IN THE CONSTRUCTION OF ROADS AND EMBANKMENTS HAS BEEN SUCCESSFULLY DEMONSTRATED IN THE COUNTRY AND IT IS GAINING ACCEPTANCE. THE NTPC (NATIONAL THERMAL POWER CORPORATION) IS SETTING UP TWO FLY ASH BRICK MANUFACTURING PLANTS AT BADARPUR AND DADRI NEAR DELHI.

IF WE DRAW UP A GENERAL COMPARISON BETWEEN THE CLAY BRICKS THAT ARE IN USE TODAY WITH THE FLY ASH BRICKS, THE ODDS FOR THE LATTER ARE FOUND TO BE QUITE ADVANTAGEOUS.

FLY ASH BRICKS	NORMAL CLAY BRICKS
UNIFORM PLEASING COLOUR LIKE CEMENT	VARYING COLOUR AS PER SOIL
UNIFORM IN SHAPE AND SMOOTH IN FINISH	UNEVEN SHAPE AS HAND MADE
DENSE COMPOSITION	LIGHTLY BONDED
NO PLASTERING REQUIRED	PLASTERING REQUIRED
LIGHTER IN WEIGHT	HEAVIER IN WEIGHT
COMPRESSIVE STRENGTH IS AROUND 100 KG/CM^2	COMPRESSIVE STRENGTH IS AROUND 35 KG/CM^2
LESS POROUS	MORE POROUS
THERMAL CONDUCTIVITY 0.90-1.05 W/M^2 ºC	THERMAL CONDUCTIVITY 1.25–1.35 W/M^2 ºC
WATER ABSORPTION 6-12%	WATER ABSORPTION 20-25%

IN ADDITION TO THIS, DUE TO SMOOTH FINISH THEY ARE EASY TO WORK WITH, AND THE HIGH COMPRESSIVE STRENGTH MINIMIZES THE CHANCE OF BREAKAGES.

PORTLAND CEMENT

OWING TO ITS POZZOLANIC PROPERTIES, FLY ASH IS USED AS A REPLACEMENT FOR SOME OF THE PORTLAND CEMENT CONTENT OF CONCRETE. FLY ASH CAN SIGNIFICANTLY IMPROVE THE WORKABILITY OF CONCRETE. RECENTLY, TECHNIQUES HAVE BEEN DEVELOPED TO REPLACE PARTIAL CEMENT WITH HIGH-VOLUME FLY ASH (50% CEMENT REPLACEMENT). FOR ROLLER-COMPACTED CONCRETE (RCC) [USED IN DAM CONSTRUCTION], REPLACEMENT VALUES OF 70% HAVE BEEN ACHIEVED WITH PROCESSED FLY ASH AT THE GHATGHAR DAM PROJECT IN MAHARASHTRA, INDIA. DUE TO THE SPHERICAL SHAPE OF FLY ASH PARTICLES, IT CAN INCREASE WORKABILITY OF CEMENT WHILE REDUCING WATER DEMAND.

PORTLAND CEMENT FACTORY.

EMBANKMENT

FLY ASH PROPERTIES ARE UNUSUAL AMONG ENGINEERING MATERIALS. UNLIKE SOILS TYPICALLY USED FOR EMBANKMENT CONSTRUCTION, FLY ASH HAS A LARGE UNIFORMITY COEFFICIENT AND IT CONSISTS OF CLAY-SIZED PARTICLES. ENGINEERING PROPERTIES THAT AFFECT THE USE OF FLY ASH IN EMBANKMENTS INCLUDE GRAIN SIZE DISTRIBUTION, COMPACTION CHARACTERISTICS, SHEAR STRENGTH, COMPRESSIBILITY, PERMEABILITY, AND FROST SUSCEPTIBILITY.

GEOPOLYMERS

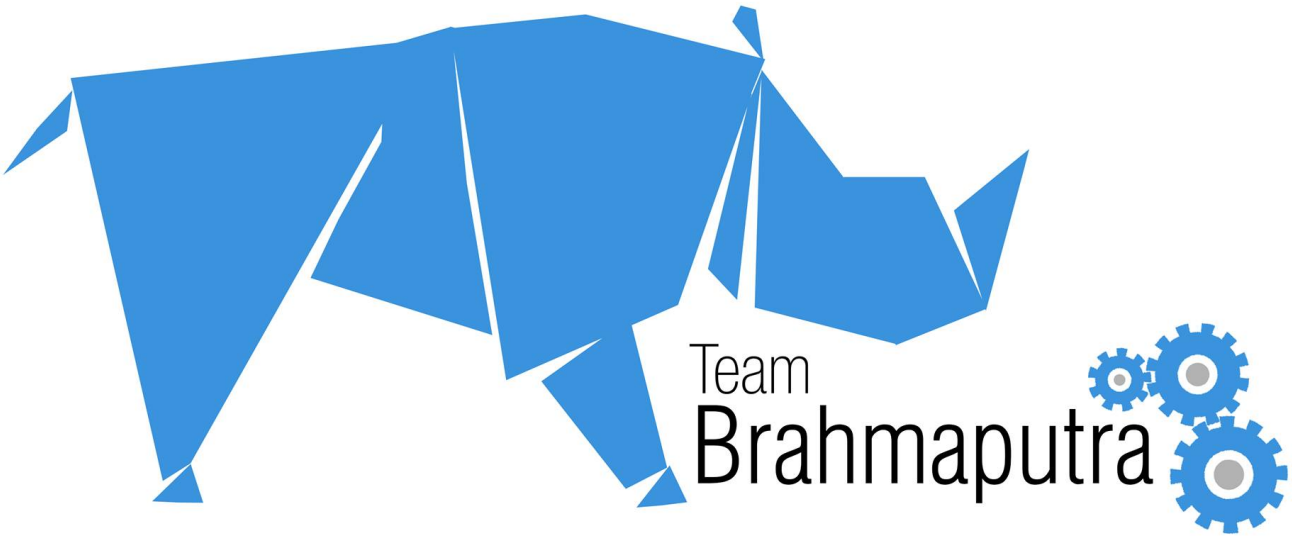
MORE RECENTLY, FLY ASH HAS BEEN USED AS A COMPONENT IN GEOPOLYMERS, WHERE THE REACTIVITY OF THE FLY ASH GLASSES IS USED TO GENERATE A BINDER COMPARABLE TO A HYDRATED PORTLAND CEMENT IN APPEARANCE AND PROPERTIES, BUT WITH POSSIBLY REDUCED CO_2 EMISSIONS.

THE PRINCIPLE OF UNCERTAINTY

HOWEVER, ALTHOUGH IT MIGHT SEEM AS A SILVER LINING IN THE FACE OF WORLDWIDE PROBLEM OF POLLUTION, THE CONSEQUENCES OF ITS AFFECT ON HEALTH IS VERY LESS STUDIED. WE KNOW FINE CRYSTALLINE SILICA PRESENT IN FLY ASH HAS BEEN LINKED WITH LUNG DAMAGE, IN PARTICULAR SILICOSIS. ANOTHER FLY ASH COMPONENT OF SOME CONCERN IS LIME (CAO) WHICH REACTS WITH WATER (H_2O) TO FORM CALCIUM HYDROXIDE [$CA(OH)_2$]. THIS CAN ALSO CAUSE LUNG DAMAGE IF PRESENT IN SUFFICIENT QUANTITIES. IN A STUDY BY NIOSH AT A CEMENT COMPANY, CRYSTALLINE SILICA EXPOSURES FROM FLY ASH WERE DETERMINED TO BE OF NO CONCERN.

THE BIG QUESTION??

SO DOES IT SOLVE ONE OF OUR PROBLEMS IN STABILIZING OUR PLANET? PERHAPS ONLY A DETAILED STUDY AND BETTER TECHNOLOGY WOULD ANSWER THIS QUESTION.



FEATURED

EFFICYCLE 2013 - THE EXPEDITION

ARINDAM CHOUDHURY 8TH SEM. MECHANICAL ENGINEERING

The desire to represent one's University in a national level competition and bring laurels in the same is an ambition that all students should pursue. When such an opportunity comes, it is upto us to utilize the opportunity to the fullest and derive as much as we can.

Such an opportunity came to us when we registered for SAE India Efficycle 2013 - a National level Hybrid Three Wheeler designing and fabrication competition, which was to be held in Chandigarh in October 2013. We would be the first team to represent Tezpur University in such a competition. This was due to the fact that in order for an institution to participate in any event of SAE (such as Efficycle, BAJA or SUPRA), it must have a registered club of SAE India. Our university obtained its membership on November 2012 and hence we were eligible to participate in the event.

The first step was to qualify for the virtual round. In this round, a complete virtual model along with relevant calculations and performance parameters were to be presented to a panel of experts. Work began on studying and designing various models of three wheelers, those which were already in practice in many parts of the world and a number of new designs of our own.

Importance had to be given to even the simplest of factors such as the configuration of wheels, seating position, power transmission, braking, etc., all of which needed to be functioning properly in order for the vehicle to work.

Our eight member team decided to divide a section of the cycle each amongst themselves such as structure, power transmission, steering, brakes and suspension, electric circuit and motor working and finally the material procurement and marketing strategies.

But it was not so that each member was to concentrate on just his own section. Members discussed about their researches and opinions with others and in turn took feedback and ideas from fellow members. This not only helped every member to gain knowledge about each section but also helped in establishing a mutual feeling of teamwork and inter-dependence together with self-dependence and responsibility.

FACTS

- SAE INDIA EFFICYCLE IS A NATIONAL LEVEL HYBRID THREE WHEELER DESIGNING AND FABRICATION COMPETITION FOR UNDERGRADUATE AND GRADUATE STUDENTS.
- IN THIS COMPETITION, THE GOAL IS TO CREATE A HUMAN POWERED VEHICLE.

" THIS COMPETITION THUS HELPED US ALL NOT JUST STRENGTHEN OUR TECHNICAL KNOWLEDGE AND SKILLS BUT ALSO HELPED US DEVELOP OUR CHARACTER IN REGARDS TO WORKING IN A TEAM AND ALSO BEING ABLE TO PERFORM OUR ROLES INDIVIDUALLY. "

The virtual round was to be held in the month of June and the finals in the month of October. We systemized our work by setting a deadline by which specified objectives had to be met. For this, daily input had to be given and continuous progress had to be made. The solution to this was to balance out our semester studies and exams along with the work needed to complete the Efficycle.

Efficient management of time had to be done so that we would be able to give adequate time to every aspect. Thus, in this way, our objective of completing the model was accomplished within the required time with input from all the members and also the guidance of our faculty advisors. The next step was to travel to Patna where the virtual round was to be held. Because of some personal problems, only four members went ahead to represent the team.

FACTS

- TEAM BRAHMAPUTRA OF TEZPUR UNVERSITY PARTICIPATED FOR THE FIRST TIME IN EFFICYCLE.
- THE COMPETITON WAS HELD AT UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY (UIET), CHANDIGARH, PUNJAB.

Teams from all across the nation, numbering in at more than a hundred and seventy, were competing in the virtual round. Most of these teams had been competing since the initiation of the competition. For Team Brahmaputra, a team competing for the first time, it was not only a learning experience but also an opportunity to put up the name of Tezpur University on this national stage.

The journey to Patna was not easy but the members endured and overcame the obstacles and finally emerged victorious. The team had qualified for the finals and was among the eighty teams who would battle it out in the final round.

FIG. 1
TEAMS LINE UP FOR THE ENDURANCE TEST AT EFFICYCLE 2013

The next phase of the journey was the most daunting part. Qualifying for the finals meant that we would now have to fabricate the model within less than two months time. One of the major causes of concern was the unavailability of many required materials and items which were crucial in making our vehicle. Lack of sponsors led to a budget constraint and this in turn was a setback which prevented us from using higher grade materials and other equipments. However, we received financial aid from the university administration and this made it possible for us to not only complete the fabrication but also make our trip to the finals in Chandigarh.

All the members gave their full efforts to make sure that no shortcomings were there in the manufacturing of the cycle. We obtained permission to use the Central Workshop after class hours which thus allowed us to fabricate the vehicle at night time in addition to any extra time we would get during class hours. Studies also had their due importance in our activities and we managed to provide time to both our studies and attend classes and exams as scheduled. This crucial time helped us in understanding and realizing the importance of time and how even a minute wasted is a huge loss. Balancing between classes and studies and fabrication of the vehicle was not an easy task. There were instances when all the members spent entire nights in the workshop operating the machines and performing welding and machining operation till the crack of dawn. We would then come to our hostels, freshen up and leave for classes. This exhausting cycle continued for many days.

FIG. 2

THE "RHINO" - OUR ENTRY FOR THE EFFICYCLE 2013

There were times when major upsets were encountered such as breakdown of the cycle, delay in arrival of items ordered, errors in the design, etc. and this did dishearten our hopes. But the entire team put up a fighting spirit and finally came through and reached their goal. The fabrication of the Efficycle was complete. The “Rhino”, as we called it, would go on to represent Tezpur University at Efficycle 2013.

The journey of the team and the Rhino to Chandigarh was not an easy one. Here again due to some unavoidable circumstances, only six members of the team would make the trip to the finals. Transporting such a big vehicle was not as easy matter at the least. Problems arose with the rail and other authorities while transporting the vehicle via rail but were somehow dealt with. We finally reached Chandigarh, a beautiful and organized city, along with the Rhino after a journey of three days which spread across more than six states. The competition was being held at UIET Chandigarh where all the Efficycles, including ours, were stationed.

A team and its vehicle representing a university which was unknown to many of the other participating teams were now being considered as one of the major competitors in the event. The final day consisted of the most important and awaited event of the competition- the circuit race. The Efficycles and their respective teams would have to give in their full effort to win the race and also complete as many laps possible within a time limit of three hours, with each lap measuring more than two kilometers and filled with slopes, off-road tracks and various other obstacles.

The lineup of all the Efficycles at the starting line was a sight to behold. As the race started and proceeded, we observed how drivers gave their best to win it all and also how many of the vehicles had serious breakdowns which restricted them from continuing the race. By the end of the race, less than half of the cycles were still in one piece and had completed the race without any breakdowns. The Rhino was one of them and it has also managed to complete almost twenty laps and had covered almost forty kilometers in the time. The Rhino had surpassed teams from various IITs and NITs and other reputed institutions in the final race as well as in its entire journey.

As the results were being declared for the various prizes in the race and other categories, we did feel disheartened at not winning anything but we were still proud and satisfied with our performance. We received positive reviews and words of praise from not only rival teams but also the management and judging committees. With this happy note, the event came to an end.

Soon after, we were on our journey back home. Unfortunately, we had to encounter some problems with the station authorities about the transportation of the Efficycle due to the size of the vehicle. After much persuasion we were able to convince them and were allowed to transport it in the cargo van of our scheduled train. The return journey seemed much shorter and happier as we now knew that Team Brahmaputra from Tezpur University had made its mark back at the event. On reaching Guwahati, few of the members decided to make a halt at their respective homes while others came back to the campus with the Rhino.

And within a few days, the official news came to us that we had secured 9th position in the entire event. A team participating for the first time, which had faced many difficulties ranging from unavailability of funds and resources to transportation, had beaten teams from prime institutes of India. Truly, all our hard work, perseverance and dedication had reaped its rewards.

FACTS

- TEAM BRAHMAPUTRA OF TEZPUR UNVERSITY SCORED AN OVERALL 9TH RANK ALL OVER INDIA.
- THE TEAM SURPASSED MOST OF THE PRESTIGIOUS INSTITUTES IN THE COMPETITION, INCLUDING MOST NITS' AND IITS'. THIS IS EXTREMELY GREAT FOR A TEAM PARTICIPATING FOR THE FIRST TIME.

THE "TEAM BRAHMAPUTRA" WITH THE RHINO - AT THE END OF THE EVENT

We now look upon our juniors to carry on the legacy of Team Brahmaputra and achieve much greater heights than we could. The journey will not be easy, many obstacles will have to be overcome and patience and strength will be tested. All we can advise is that start your activities as soon as possible and carry them out systematically. Teamwork and cooperation are essential ingredients and when mixed with hard work and dedication, success is sure to be achieved. Wishing all of you the best of luck in your endeavors and may you all reach the highest of goals.

J.A.R.V.I.S.

Prasun Kr, Roy, 2nd Sem, Mech. Engg.

EVER SINCE WE SAW THE FIRST IRON MAN MOVIE, GEEKS HAVE BEEN MESMERIZED WITH THE IRON MAN TECHNOLOGY. ONE TECHNOLOGY IN PARTICULAR HAS CAPTURED PEOPLE'S ATTENTION MORE THAN MOST, AND THAT IS TONY STARK'S IMPRESSIVE J.A.R.V.I.S. VOICE RECOGNITION SYSTEM. MR. STARK CAN PRETTY MUCH DO ANYTHING THROUGH IT. IT HAS BEEN SAID THAT SUCH A SYSTEM SIMPLY COULDN'T BE CREATED WITH TODAY'S TECHNOLOGY, BUT AS IT TURNS OUT, WE WERE ALL WRONG.

IMAGINE SPEAKING TO YOUR COMPUTER JUST LIKE YOU WOULD COMMUNICATE WITH A REGULAR HUMAN BEING. ADD TO THAT A SYSTEM WHICH ALLOWS YOU TO HAVE THE COMPUTER IT'S INSTALLED ONTO DO ANYTHING YOU ASK IT TO. IF YOU WANT IT TO OPEN UP A BROWSER AND GO TO YOUR FACEBOOK PAGE, ALL YOU NEED TO DO IS SAY, "OPEN FACEBOOK" AND VOILA!

INTEL'S CHIP GIANT UNVEILED "JARVIS", A HEADSET THAT ACTS AS A PERSONAL ASSISTANT FOR TASKS INCLUDING ANSWERING THE PHONE, MAKING RESERVATIONS AND WARNING USERS WHEN THERE'S A CALENDAR CONFLICT.BASICALLY IT'S A KIND OF WEARABLE TECH THAT WORKS ON THE VOICE OF USER.

JARVIS, EVIDENTLY, IS FROM THE UK AND SPEAKS WITH A NOTICEABLE BRITISH ACCENT.

WHEN AN EXECUTIVE ASKED JARVIS TO MAKE DINNER RESERVATIONS AT AN INDIAN RESTAURANT CLOSE TO THE CONSUMER ELECTRONICS SHOW HERE, THE HEADSET ASKED WHETHER THE EXECUTIVE ALSO WANTED TO CANCEL A CONFLICTING MEETING.

YES, IT DID!!

MICHAEL GHANDOUR, AN INNOVATOR AND VOICE RECOGNITION PIONEER, DECIDED THERE MUST BE A WAY TO CREATE A REAL J.A.R.V.I.S. SYSTEM THAT, WITH A LITTLE BIT OF EFFORT, COULD DO JUST ABOUT ANYTHING YOU TOLD IT TO. THE RESULT OF HIS VISION AND HARD WORK IS A VOICE RECOGNITION SYSTEM CALLED MAKO.

THIS TECHNOLOGY HAS ALWAYS BEEN INSPIRED BY FICTION. FOR INSTANCE, THE WORLD GOT ITS FIRST GLIMPSE OF THE MOBILE PHONE IN THE POPULAR TV SERIES STAR TREK. NOW, TAKING A CUE FROM IRON MAN, TWO YOUNG INDIAN TECHNOLOGISTS WANT TO PLAY TONY STARK AND ASK THEIR COMPUTER TO DO STUFF FOR THEM. TO MAKE THINGS EASY, THEIR INTELLIGENT ASSISTANT IS ALSO CALLED JARVIS AFTER STARK'S VIRTUAL BUTLER.

DELHI-BASED *CHIRAG DEWAN* AND JAIPUR'S *HIMANSHU VAISHNAV*, BOTH COMPUTER SCIENCE STUDENTS IN THEIR EARLY TWENTIES, THINK THEIR IDEA OF ARTIFICIAL INTELLIGENCE CAN CHANGE COMPUTING FOR EVER. WHILE START-UPS THE WORLD OVER ARE WORKING ON SOLUTIONS THAT MAKE INPUT METHODS FOR COMPUTING MORE NATURAL, JARVIS CORP IS WORKING ON AN ENTIRE OPERATING SYSTEM THAT IS FULLY AUTOMATED AND LEARNS AS IT GOES. OF COURSE, IT WILL INTERACT WITH THE USER WITH THE HELP OF VOICE AND GESTURES ALONG WITH TRADITIONAL INPUT METHODS.

AT THE CORE OF JARVIS IS ARTIFICIAL INTELLIGENCE, WHICH THE DUO THINK CAN BE INCLUDED IN THE SYSTEM AS A COMPONENT. “SO, THE NEXT TIME IT PERFORMS EVEN BETTER. WITH THE INCLUSION OF UNCONVENTIONAL INPUTS AS THE STANDARD, YOU WILL COMMUNICATE WITH THE SYSTEM AS IF IT IS AN INDIVIDUAL,” ADDS VAISHNAV.

MANY COUNTRIES HAVE STARTED THEIR RESEARCH ON THIS TECHNOLOGY.

ABS

BRAKING REDEFINED

ANTI - LOCK BRAKING SYSTEM

NAZMIN AHMED 2ND SEM. DEPT. OF MECHANICAL ENGINEERING

A PERSON SITTING IN A CAR WITHOUT BRAKES IS ANALOGOUS TO A PERSON TRAVELLING IN AN AIRPLANE WITH NO LANDING GEAR. THE FATE OF BOTH WOULD LEAD THEM TO CERTAIN DEATH.

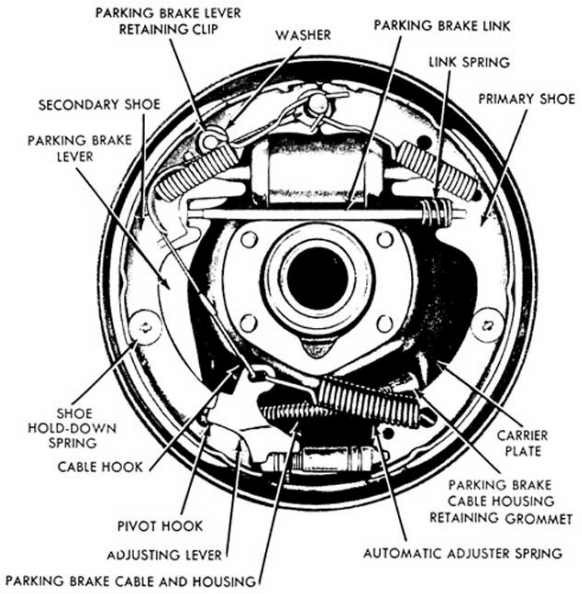


FIG. 1
BASIC SCHEMATIC DIAGRAM OF A DRUM BRAKE

SPEAKING STRICTLY OF AUTOMOBILES, THE ROLE OF BRAKING SYSTEM IS INDISPENSIBLE. WITH RESEARCH CARRIED OUT INTENSIVELY TO IMPROVE THE EFFICIENCY OF THE BRAKING SYSTEM UNDER ANY CONDITIONS, THERE HAS BEEN TREMENDOUS DEVELOPMENT IN THIS SEGMENT OF AUTOMOTIVE.

ONE CRUCIAL DEVELOPMENT WAS THE ANTILOCK BRAKING SYSTEM (ABS) WHICH THOUGH ORIGINALLY DEVELOPED FOR AIRCRAFT USE IN 1929 SOON FOUND ITS PLACE IN THE WORLD OF AUTOMOTIVE AS WELL. WITH THE INTRODUCTION OF ABS, CONTROLLABILITY HAS FOUND NEW DIMENSIONS.

IMAGINE YOURSELF DRIVING A CAR IN A FREEWAY OR ANY BUSY STREET. THERE ARISES A SITUATION WHERE YOU NEED TO STOP THE CAR WITHIN A FEW METER'S RANGE. YOU PUSH THE BRAKE HARD BUT SOON FIND YOURSELF CRASHING AT AN OBSTACLE AHEAD. CAN A SITUATION LIKE THIS BE AVOIDED? WITH ABS INSTALLED, THE ANSWER IS -YES.

THE ABS IS A FOUR-WHEEL SYSTEM THAT PREVENTS WHEEL LOCK-UP BY AUTOMATICALLY MODULATING THE BRAKE PRESSURE DURING AN EMERGENCY STOP. BY PREVENTING THE WHEELS FROM LOCKING, IT ENABLES THE DRIVER TO MAINTAIN STEERING CONTROL AND TO STOP IN THE SHORTEST POSSIBLE DISTANCE UNDER MOST CONDITIONS.

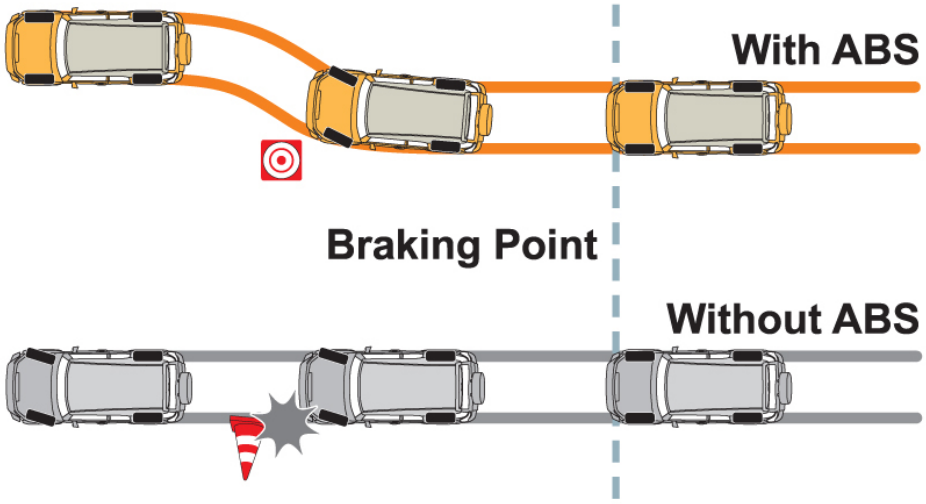


FIG. 2

TESTING A SHARP TURN - WITH ABS & WITHOUT ABS

ANTILOCK BRAKES ARE BENEFICIAL AS IT ENABLES THE DRIVER TO STOP FASTER AND MORE IMPORTANTLY STEER WHILE BRAKING. THIS FEATURE OF IT SOLVES MUCH OF THE PROBLEMS RELATED TO CRASHES, THUS ENSURING A SAFER DRIVE.

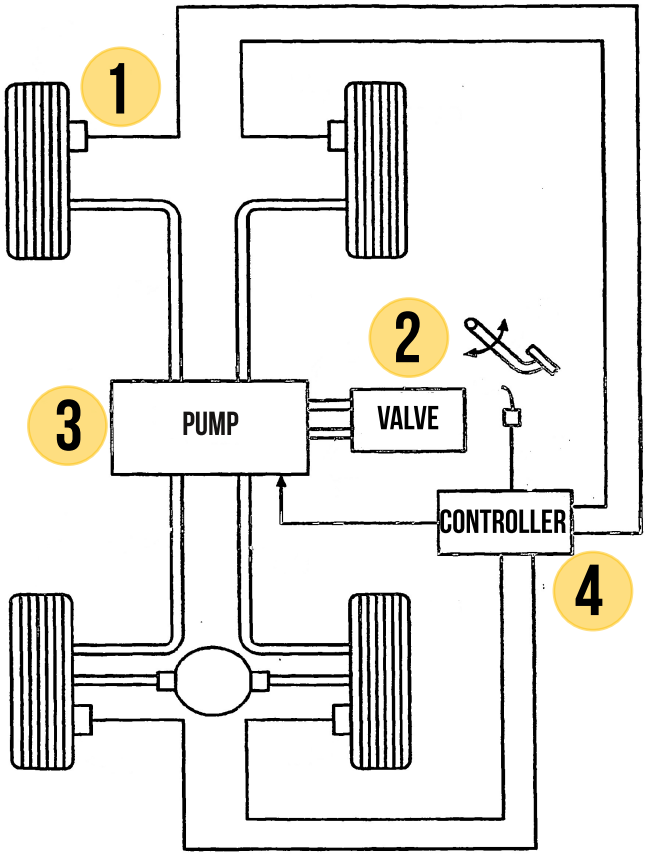


FIG. 3

SCHEMATIC CHASSIS DIAGRAM FOR ABS

COMPONENTS OF ABS

1. SPEED SENSORS
2. VALVES
3. PUMP
4. CONTROLLER

1 **SPEED SENSORS** DETERMINE THE ACCELERATION OR DECELERATION IN THE WHEELS

2 **VALVES** THERE IS A VALVE IN THE BRAKE LINE OF EACH BRAKE CONTROLLED BY ABS. AN INOPERABLE VALVE PREVENTS THE SYSTEM FROM MODULATING THE VALVES AND CONTROLLING PRESSURE SUPPLIED TO THE BRAKES.

3 **PUMP** RESTORES THE PRESSURE TO THE HYDRAULIC BRAKES AFTER THE VALVES HAVE RELEASED IT. A SIGNAL FROM THE CONTROLLER RELEASES THE VALVE AT THE DETECTION OF WHEEL SLIP.

AFTER A VALVE RELEASES THE PRESSURE SUPPLIED FROM THE USER, THE PUMP IS USED TO RESTORE A DESIRED AMOUNT OF PRESSURE TO THE BRAKING SYSTEM. THE CONTROLLER WILL MODULATE THE PUMPS STATUS IN ORDER TO PROVIDE THE DESIRED AMOUNT OF PRESSURE AND REDUCE SLIPPING.

4 **CONTROLLER** RECEIVES INFORMATION FROM EACH INDIVIDUAL WHEEL SPEED SENSOR.

IF A WHEEL LOSES TRACTION, THE SIGNAL IS SENT TO THE CONTROLLER, THE CONTROLLER WILL THEN LIMIT THE BRAKE FORCE (EBD) AND ACTIVATE THE ABS MODULATOR WHICH ACTUATES THE BRAKING VALVES ON AND OFF.

THE CONTROLLER LOOKS FOR DECELERATIONS IN THE WHEEL THAT ARE OUT OF THE ORDINARY. RIGHT BEFORE THE WHEEL LOCKS UP, IT EXPERIENCES A RAPID DECELERATION. IF LEFT UNCHECKED, THE WHEEL WOULD STOP MUCH MORE QUICKLY THAN ANY CAR COULD.

THE ABS CONTROLLER REDUCES THE PRESSURE TO THAT BRAKE UNTIL IT SEES ACCELERATION, THEN IT INCREASES THE PRESSURE UNTIL IT SEES THE DECELERATION AGAIN AND QUICKLY. THE RESULT IS THAT THE TIRE SLOWS DOWN AT THE SAME RATE AS THE CAR, WITH THE BRAKES KEEPING THE TIRES VERY NEAR THE POINT AT WHICH THEY WILL START TO LOCK UP.

THIS GIVES THE SYSTEM MAXIMUM BRAKING POWER.

HOW EFFECTIVE IS ABS ?

ANTI-LOCK BRAKES REALLY DO HELP YOU STOP BETTER. BUT DO THEY REALLY PREVENT ACCIDENTS? THIS IS THE TRUE MEASURE OF THE EFFECTIVENESS OF ABS SYSTEMS.

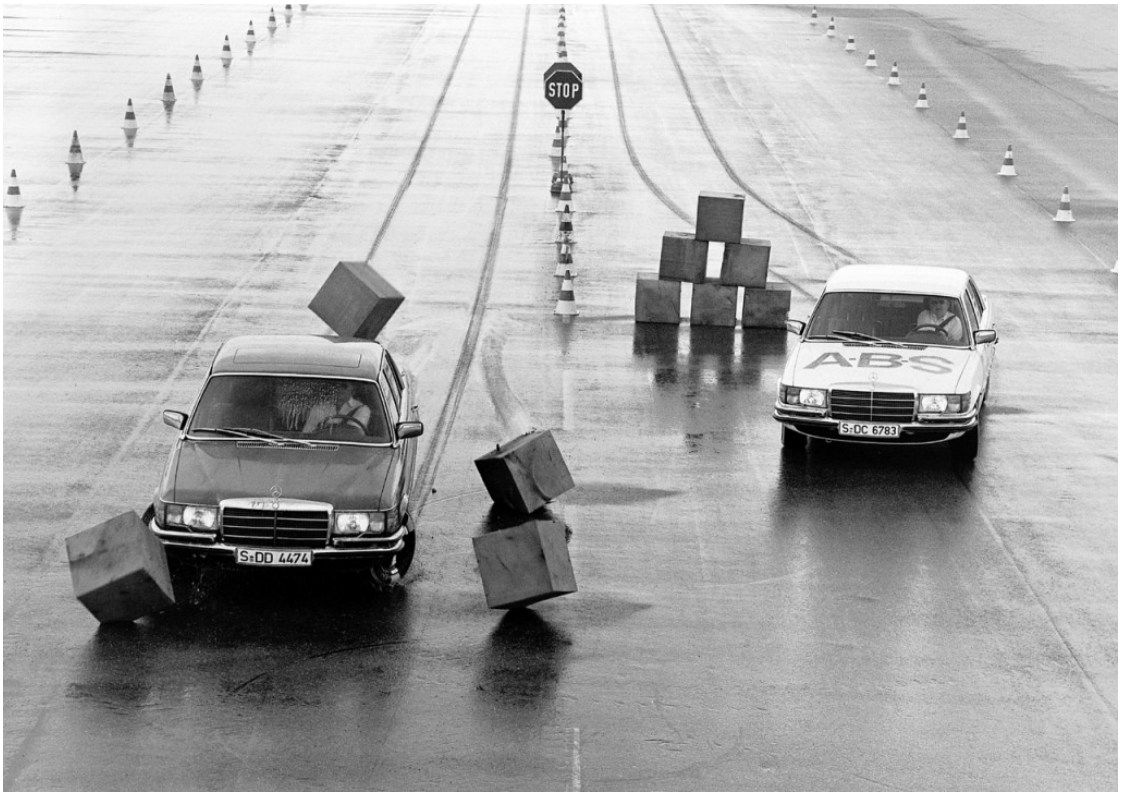


FIG. 3

AN ABS TEST RUN BY MERCEDES. SAFETY STANDARDS ARE A MUST IN EVERY ABS IMPLEMENTATION

THE INSURANCE INSTITUTE FOR HIGHWAY SAFETY (IIHS) HAS CONDUCTED SEVERAL STUDIES TRYING TO DETERMINE IF CARS EQUIPPED WITH ABS ARE INVOLVED IN MORE OR FEWER FATAL ACCIDENTS. IT TURNED OUT IN A 1996 STUDY THAT VEHICLES EQUIPPED WITH ABS WERE OVERALL NO LESS LIKELY TO BE INVOLVED IN FATAL ACCIDENTS THAN VEHICLES WITHOUT. THE STUDY ACTUALLY STATED THAT ALTHOUGH CARS WITH ABS WERE LESS LIKELY TO BE INVOLVED IN ACCIDENTS FATAL TO THE OCCUPANTS OF OTHER CARS, THEY ARE MORE LIKELY TO BE INVOLVED IN ACCIDENTS FATAL TO THE OCCUPANTS OF THE ABS CAR, ESPECIALLY SINGLE-VEHICLE ACCIDENTS.

THE MAIN ADVANTAGE OF AN ANTILOCK BRAKING SYSTEM IS INCREASED DRIVER CONTROL IN AN EMERGENCY SITUATION. STILL, THE BEST WAY TO TAKE ADVANTAGE OF THAT IS TO TRY TO STAY OUT OF THE EMERGENCY SITUATION. PAY ATTENTION TO YOUR SURROUNDINGS, DON'T FOLLOW CARS TOO CLOSELY, AND ALWAYS HAVE AT LEAST ONE ESCAPE ROUTE IF ANYTHING HAPPENS ON THE ROAD NEAR YOU. KNOW YOUR CAR'S LIMITS AND YOUR OWN LIMITS.

KNOWING

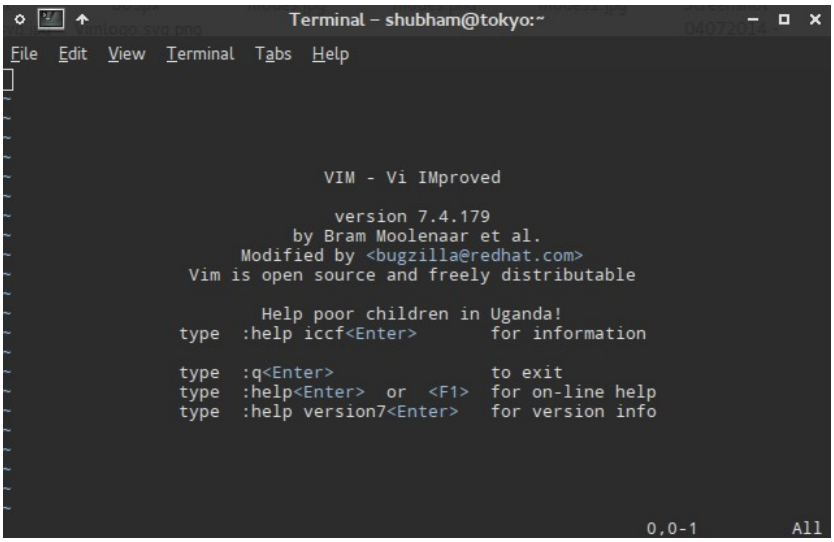
THE WORLD-CLASS LIGHTWEIGHT CHAMPION OF TEXT EDITORS

PRASHANT KUMAR ANURAGI 6TH SEM COMPUTER SCIENCE & ENGINEERING

VI-IMPROVED COMMONLY KNOWN AS VIM, IS ONE OF THE MOST WIDELY USED EDITOR IN UNIX / LINUX. IT IS AN EXTREMELY POWERFUL EDITOR BUT THE REAL POWER IS HIDDEN IN IT'S COMMANDS, SO HERE I WILL TELL YOU VERY BASIC THINGS ABOUT VIM THAT A USER MUST KNOW AND WILL DISCUSS SOME FEATURES THAT A USER NEEDS WHILE WORKING.

THE THREE MODES OF VI

VIM USES THREE DIFFERENT MODES FOR SHARING THE WORKLOAD. WE DEMONSTRATE THIS BY USING VIM ON A FILE. SINCE VIM RUNS IN A TERMINAL, WE OPEN A FILE NAMED "SOMETEXT" IN VIM BY TYPING `vi sometext`

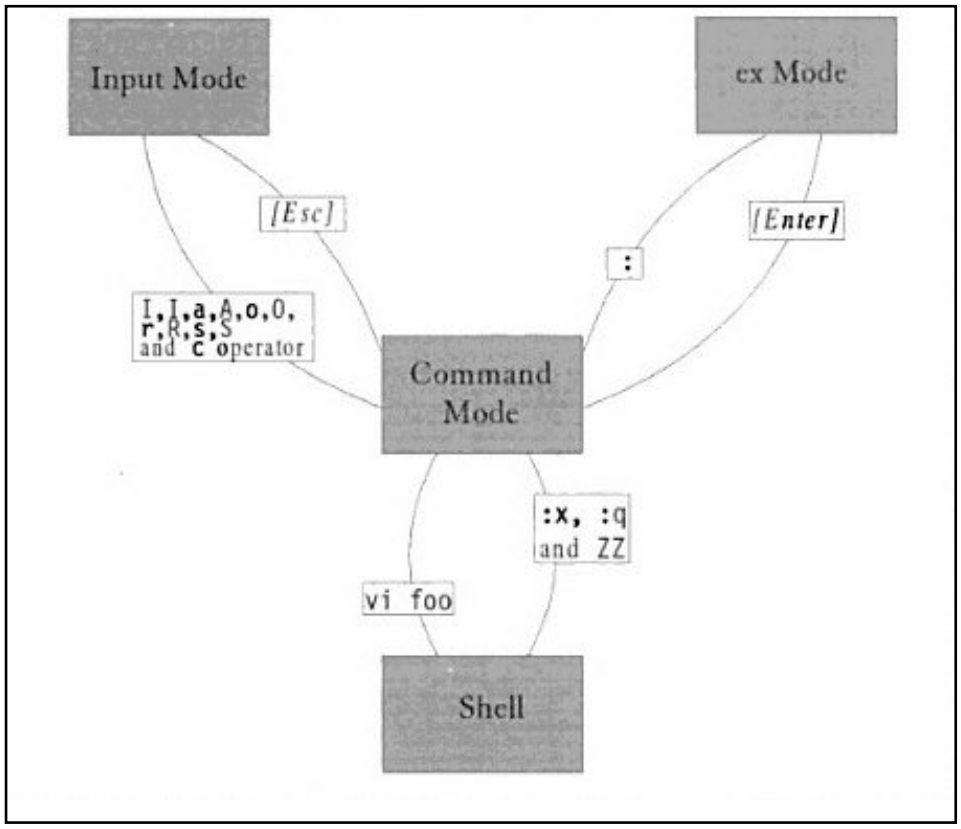


THE ICONIC 'HOME SCREEN' OF VIM WHICH APPEARS WHEN IT IS STARTED OR WHEN NO FILE IS CURRENTLY OPEN

RIGHT NOW YOU ARE IN "COMMAND MODE", DEFAULT MODE OF VIM. THIS IS THE MODE WHERE YOU CAN PASS COMMANDS TO ACT ON TEXT. IN THIS MODE YOU CAN'T ENTER OR REPLACE TEXT.

FOR TEXT EDITING YOU MUST SWITCH TO "INPUT MODE". FIRST PRESS THE KEY '**i**', AND YOU ARE IN INPUT MODE READY TO INPUT SOME TEXT. AFTER YOU INPUT SOME TEXT PRESS [ESC] TO SWITCH TO COMMAND MODE AND TO SAVE THIS FILE PRESS ":" (COLON) AND NOW YOU WILL BE IN EX MODE. TYPE '**x**' AND PRESS ENTER.

```
:x [Enter] (Saves file and then quits VIM.)
```



OVERVIEW OF ALL MODES IN VIM : INPUT MODE, EX MODE, COMMAND MODE

THE EX MODE IS SIMILAR TO COMMAND MODE BUT IS ONLY USED FOR BATCH PROCESSING FILES. IT IS NOT USED FOR EDITING PURPOSES.

THE .VIMRC FILE

WHEN WE START VIM FOR THE FIRST TIME, THE SETUP IS QUITE A BARE-BONES TYPE. WE SEE THAT MOST OF THE TEXT EDITING FEATURES ARE DISABLED, NO LINES NUMBERS ARE SHOWN, NO SYNTAX-HIGHLIGHTING, NO AUTO-INDENTATION ETC. ABSENCE OF THESE VITAL FEATURES IS NOT GOOD FOR ANY PROGRAMMER OR VIM-USER.

WELL YOU CAN ADD THESE FEATURES AND CUSTOMISE ALMOST EVERYTHING ABOUT VIM THROUGH THE **.vimrc** FILE.

THE .VIMRC IS THE CENTRAL CONFIGURATION FILE FOR VIM. BEFORE VIM STARTS, IT LOADS ALL CUSTOMISATIONS THROUGH THIS FILE.

THIS FILE IS FOUND IN THE "HOME" FOLDER OF EVERY LINUX USER. IT IS USUALLY EMPTY BY DEFAULT. TO OPEN IT, WE NEED TO GET INTO OUR HOME FOLDER AND THEN EDIT THE FILE :

```
cd                  [cd command chages to home directory]
vim .vimrc          [instructs vim to open .vimrc file]
```

GO TO INPUT MODE BY PRESSING **i** AND THEN WRITE THESE STATEMENTS

```
set ai                  // for auto-indentation
set number              // to show line numbers
set laststatus=2        // to show a statusbar at bottom
set showmatch           // locate matching brackets
```

THEN SAVE AND QUIT BY ENTERING INTO COMMAND MODE (BY PRESSING [ESC]) AND TYPING
:wq OR **:x** [ENTER]

'wq' STANDS FOR 'WRITE AND QUIT'. THE WORD 'WRITE' REFERS TO SAVING A FILE TO DISK. WHEN WE START VIM AGAIN, WE CAN SEE A POWERFUL AND BEAUTIFULLY CONFIGURED TEXT EDITOR.

A FEW USEFUL COMMANDS

VIM IS HIGHLY COMMAND-ORIENTED. YOU DON'T NEED TO REMEMBER EACH AND EVERY COMMAND, YOU WILL GET USED TO THE ONES WHICH YOU USE THE MOST. THE COMMAND MODE IS EXTREMELY FLEXIBLE FOR ALL TYPES OF EDITING PURPOSES, WHICH IS WHAT MAKES VIM ONE OF THE MOST POWERFUL EDITORS ON THE PLANET.

THERE ARE MANY OTHER OPTIONS ALSO:

COMMANDS	ACTIONS
:w	Save file and remain in editing mode
:x	Save and quits editing mode
:wq	Same as :wq
:w *newfile*	Like "Save As" option in Windows
:q	Quits VIM if no changes are made
:sh	Escape to shell (VIM keeps running in the background)

SEARCH FOR A TEXT OR PATTERN (/ AND ?)

VIM IS VERY POWERFUL IN SEARCHING. SEARCHING IS SAME AS THE "FIND" OPTION IN MOST EDITORS. IT CAN BE DONE IN BOTH FORWARD AND BACKWARD DIRECTION.

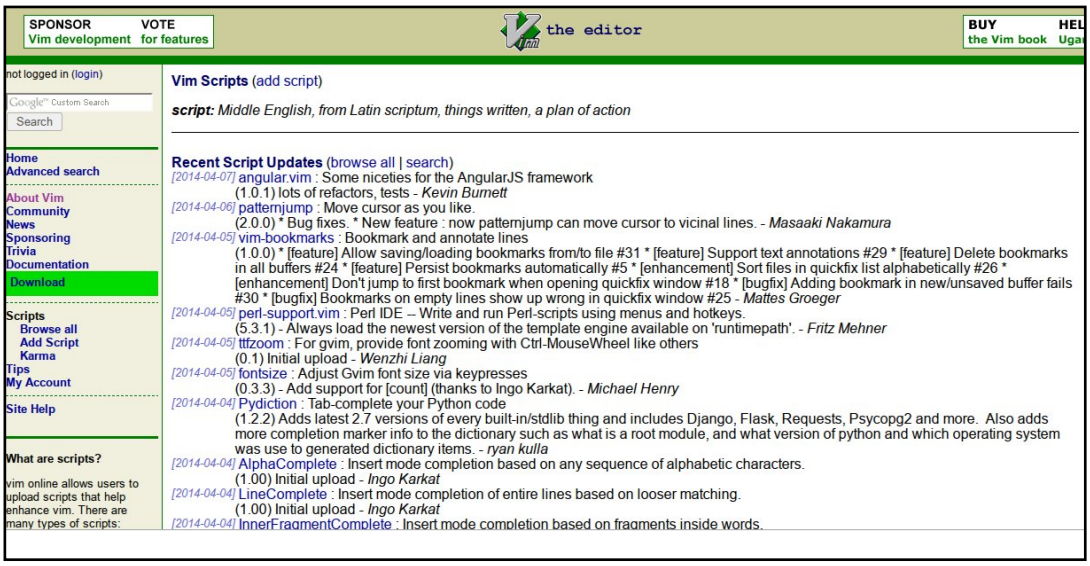
SEARCHING IS INITIATED FROM THE COMMAND MODE. SO IF YOU WANT TO SEARCH FOR A TEXT PATTERN IN YOUR FILE THEN FIRST THING YOU DO IS SWITCH TO COMMAND MODE BY PRESSING [ESC] AND THEN TYPING :

`/pattern[Enter]` [SEARCH FORWARD]

OR

`?pattern[Enter]` [SEARCH BACKWARD]

REPLACE THE WORD "PATTERN" WITH THE WORD YOU WANT TO SEARCH FOR. IT ALSO SUPPORTS WILDCARDS.



CURRENTLY, THERE ARE ABOUT 4814 ADDON SCRIPTS AVAILABLE FOR VIM

VIM HAS INFINITE POSSIBILITIES. VIM CAN BE CUSTOMISED THROUGH A PLETHORA OF ADDONS, COMMNADS AND EVEN COLOR THEMES !

ANY USER CAN CUSTOMISE VIM AND MAKE IT SUPER-PRODUCTIVE ACCORDING TO HIS/HER NEEDS. SO KEEP EXPLORING OTHER FEATURES OF VIM AND SOON YOU CAN BECOME A MASTER.

MAGIC OF ZERO AND ONE

MIHIR KUMAR SINGH 6TH SEM COMPUTER SCIENCE & ENGINEERING

HAVE YOU EVER WONDERED THE IMPORTANCE OF ZERO AND ONE???

ALL OF US WANT A LARGE POCKET MONEY, SCORE HIGH IN EXAMINATIONS AND GET A HIGH SALARY. SO LARGENESS PERVADES IN OUR MINDS. ALL OF US WANT EVERYTHING BIG IN LIFE. THIS IS JUSTIFIED, AS THE WILL TO GROW IS DYNAMISM, AND DYNAMISM IS LIFE. BUT SOMETIMES SMALL THINGS DO SOME JOBS SO ELEGANTLY AND SILENTLY THAT WE DON'T EVEN REALISE THEIR IMPORTANCE. THE SAME IS THE STORY FOR ZEROS AND ONES.

ONLY A FEW OF US WILL AGREE TO THE FACT THAT THE WHOLE WORLD IS CONTROLLED BY THESE TWO MAGIC NUMBERS. READING THE ARTICLE ALL THIS WHILE, YOU MIGHT NOT BE CONVINCED ABOUT THE IMPORTANCE OF THESE NUMBERS.

SO LET US EXPLORE THE TRUTH. FOR THAT WE NEED TO MOVE OUT OF OUR CABIN. LET'S GO...!!!

WAIT...HAVE YOU FORGOTTEN TO SWITCH THE LIGHTS OFF...? SWITCHING LIGHTS ON AND OFF IS A MAGIC OF ZEROS AND ONES. 1 INDICATES ON AND 0 INDICATES OFF IN ELECTRONICS. NOW MOVING TO THE BASEMENT TO GET OUR BIKE LET US TAKE THE LIFT RATHER THAN THE STAIRCASE.

WE PRESS 0.... THERE IS 0 AND 1 AGAIN. LET US INVITE A FRIEND OVER PHONE TO JOIN US. HERE AGAIN WE TAKE THE HELP OF 0 AND 1. WE PRESS THE CALL BUTTON ON, WHICH IN TURN TRIGGERS THE WHOLE ASSOCIATED CIRCUITRY TO STATE 1 (I.E. ON STATE) MAKING THE MICROCONTROLLER TO PROCESS OUR REQUEST TO CALL THE FRIEND. THIS THEN PUSHES THE ANTENNA TO STATE 1 TO SEND SOME SIGNAL TO THE NEARBY BASE STATION WHICH IN TURN SENDS IT TO SATELLITES(ACTING AS A REFLECTOR), REFLECTING OUR CONNECT REQUEST TO SOME OTHER ZONE WHERE THE FRIEND RESIDES. WE CAN THUS SEE THAT IN ALMOST EVERY STEP WE USE 0 OR 1

HAVE YOU EVER REALISED HOW YOU SHARE VIDEOS AND PICTURES? WELL LET ME TELL YOU THAT WHENEVER YOU SEND A MESSAGE TO ANYONE VIA SMS OR AN E-MAIL, ALL YOU DO IS SEND A STREAM OF 0 AND 1. WHEN A PROGRAMMER CODES, HE/SHE IS ALMOST UNAWARE OF THE THINGS HAPPENING BEHIND THE SCENES IN THE COMPUTER SYSTEM DURING COMPILATION. THE ONLY THING HE KNOWS IS THAT GIVEN A CORRECT INPUT, THE COMPUTER WILL GIVE AN OUTPUT. IN REALITY, EVERY SINGLE CHARACTER WE WRITE IS STORED IN THE COMPUTER AS A COMBINATION OF 0'S AND 1'S.

IF WE HAVE A PHILOSOPHICAL MENTALITY, THEN WE CAN THINK GOOD BEHAVIOUR AND GOOD THINKING AS 1 AND THE OTHER AS 0. 1 MEANS LOGICALLY HIGH AND 0 MEANS LOGICALLY LOW

SO WE SEE HOW EVERY SIMPLE THING IN OUR LIVES INVOLVE 0'S AND 1'S. IT WAS JUST A BLEAK PICTURE OF THE IMPORTANCE OF THESE NUMBERS. ACTUALLY, 0 AND 1 TOGETHER CONTROLS THE WHOLE WORLD.

TRIVIA CORNER

ANUBHAV JOSHI
6TH SEM. DEPT. OF MECHANICAL ENGINEERING

1. WHO ARE THE FOUNDERS OF WHATSAPP ?

WHO (OR WHAT) COULD SUFFER FROM GRAVITY, JERUSALEM, LIBERTY & HONG KONG ? **2.**

THE FIRST FRENCH **3.** SATELLITE WAS NAMED AFTER WHAT ?

4. WHICH INDIAN MOBILE TECH GIANT'S NAME IS DERIVED FROM A COMIC BOOK CHARACTER ?

(CURRENTLY HUGH JACKMAN ENDORSES THIS COMPANY.)

WHICH IS THE ONLY GAME PLAYED ON THE MOON ? **5.**

6. WHAT DOES THE 'SONY VAIO' LOGO REPRESENT ?

WHO IS THE DEVELOPER OF 'WECHAT' ? 7.

WHO IS THE DEVELOPER OF 8.

FLAPPY BIRD ?

9. WHICH WEBSITE IS DONATED TO SCIENCE AND MATHEMATICS WHOSE FOUNDING MEMBER INCLUDES OUR VERY OWN MANJIT P. SAIKIA ?

WHICH AWARD IS GIVEN TO THE BEST COLLABORATIVE FILTERING ALGORITHM TO PREDICT USER RATINGS FOR FILMS ? 10.

WHO IS THE FAMOUS INDIAN 11.

WHO CREATED INTELLIGENT SYSTEMS WHICH HAVE BEEN USED IN APPLICATIONS IN NASA, BOEING AND OTHER TECHNOLOGICAL CORPORATIONS ?

12. THE USB LOGO IS KNOWN AS ?

WHAT WAS FOUNDED IN 1971 BY MICHAEL S. HART ?

IT IS THE OLDEST DIGITAL LIBRARY **13.**

14. WHICH IS THE FIRST COUNTRY IS TO BE AWARDED ON OSCAR FOR SPECIAL CONTRIBUTION TO THE MUSIC INDUSTRY WITH THE NYSE STOCK TICKER DLB ?

15. WHAT APPLE'S HEADQUARTERS CALLED ?

ANSWERS OF ALL THE QUESTIONS ARE GIVEN AT THE LAST

FOOD: THINK, EAT & SAVE HUNGER

JINKU BORA, M.TECH FET

POPE FRANCIS SAYS: "THROWING FOOD AWAY IS LIKE STEALING FROM THE TABLE OF THE POOR AND THE HUNGRY." WASTING FOOD IS A COMMON PRACTICE BOTH AT HOME AND OUTSIDE. THINK ABOUT THE AMOUNT YOU CAN EAT BEFORE YOU SIT FOR BREAKFAST, LUNCH OR DINNER. BY DOING SO, YOU CAN SAVE FOOD FOR THE POOR AND THE NEEDY.

ACCORDING TO UNITED NATION FOOD AND AGRICULTURE ORGANISATION, ONE THIRD OF WORLD'S FOOD PRODUCE ENDS UP BEING WASTED. MATT SIMISTER, GROUP FOOD COMMERCIAL DIRECTOR AT TESCO SAID, "IN A WORLD OF SEVEN BILLION PEOPLE, ONE BILLION GO TO BED HUNGRY, WHILE MANY OTHERS ARE OBESE. HOW DO WE BALANCE THE SYSTEM? WE CAN BE MORE PRODUCTIVE OR WASTE LESS – OR A BALANCE OF THE TWO."ALTHOUGH WE KNOW THAT THE WORLD PRODUCES ENOUGH FOOD TO FEED EVERYONE, WE WASTE FOOD AND DEPRIVE THE NEEDY OF THE SHARE OF FOOD THEY OWE.

ONE THIRD OF INDIA'S PRODUCE, ONE OF WORLD'S LARGEST PRODUCERS OF FRUITS AND VEGETABLES, GETS ROTTEN BECAUSE OF POOR STORAGE, TRANSPORT AND DISTRIBUTION. FOOD PRICES RISE STUBBORNLY DUE TO SHORTAGE OF THE FOOD COMMODITIES. THE POOR AND THE MARGINAL ARE FORCED TO GO TO SLEEP WITHOUT HAVING A PROPER DIET DUE TO HIKE IN THE FOOD PRICES.

THE 2013 GLOBAL HUNGER INDEX (GHI)CALCULATED FOR 120 COUNTRIES AND COUNTRIES IN TRANSITION, FOUND 56 COUNTRIES IN A WORSE OR SEVERE SITUATION. INDIA STATE HUNGER INDEX (ISHI) WAS CONSTRUCTED IN THE SAME FASHION AS THE GHI COVERING MORE THAN 95% OF THE POPULATION. DESPITE OF ECONOMIC PERFORMANCES, INDIA IS HOME TO A LARGE NUMBER OF HUNGRY PEOPLE IN THE WORLD.

WE CANNOT ALLOW ONE-THIRD OF ALL THE FOOD WE PRODUCE TO BE WASTED OR BE LOST BECAUSE OF INAPPROPRIATE PRACTICES, WHEN ONE BILLION PEOPLE GO HUNGRY EVERY DAY.THERE SHOULD BE APPROPRIATE TECHNOLOGIES OF FOOD STORAGE PRACTICES TO COMBAT WASTAGE.INCLUSIVE ECONOMIC GROWTH, TECHNOLOGICAL APPLICATIONS AND TARGETED STRATEGIES TO ENSURE FOOD SUFFICIENCY CAN DETER HUNGER AWAY FROM OUR SOCIETY.

THE INTERNET OF THINGS

THE FUTURE OF THE INTERNET IS NOT ONLY IN CONNECTING PEOPLE BUT IN CONNECTING **EVERYTHING**.

SHUBHAM SHARMA B.TECH (2ND SEM.), DEPT. OF ELECTRONICS & COMMUNICATION

The **INTERNET OF THINGS** involves bringing devices and sensors onto a network, connecting them to the Internet and allowing them to communicate without human interaction.

It is supposedly one of the biggest upcoming things of the future.

The concept of the Internet of Things first became popular through the **AUTO-ID CENTER AT MIT**, where Kevin Ashton in 1999 came up with the preliminary idea of connecting everything in a network, through simple radio-frequency tagging popularly known as RFID.

RFID is acronym for **RADIO FREQUENCY IDENTIFICATION**, a non-contact use of radio-frequency electromagnetic fields to transfer data.

" If we had computers that knew everything using data they gathered without any help from us, we would be able to track everything, and greatly reduce waste, loss and cost.

We would know when things needed replacing, repairing, and whether they were fresh or past their best.

The Internet of Things has the potential to change the world, just as the Internet did.

MAYBE EVEN MORE SO "

- KEVIN ASHTON

'That 'Internet of Things' Thing'
RFID Journal
July 22, 2009

THE BASIC IDEA OF INTERNET OF THINGS

is TO givE a unique identifier to every device, object, and human being
and the ability to automatically transfer data, most of the time without human interaction,
through the Internet

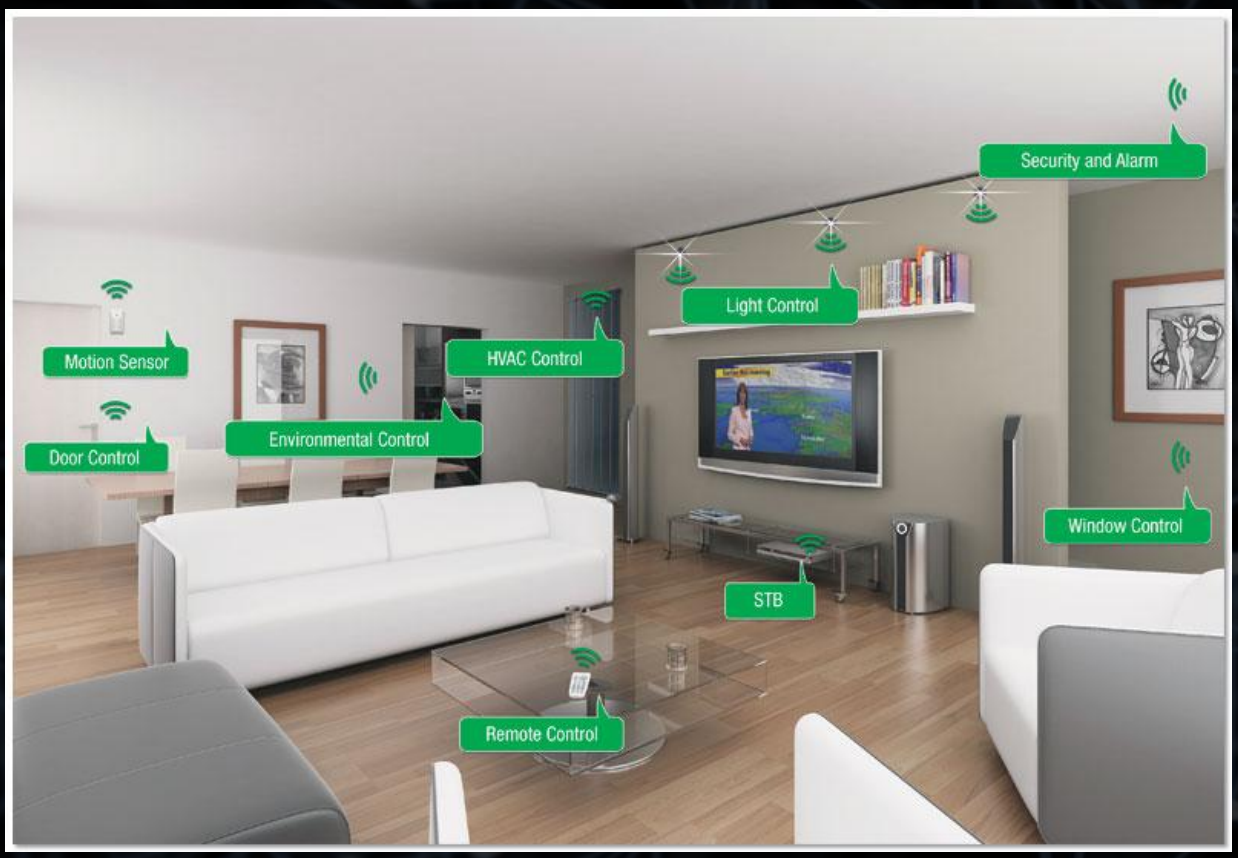


FIG. 1

A TYPICAL INTERNET OF THINGS SCENARIO

A TYPICAL SCENARIO

"Let's say you have a house, with all devices interconnected to each other. In the Internet of Things scenario, the thermostat in your house will automatically adjust the air conditioner cooling according to the day's temperature for a comfortable living. Lights will switch on as soon as you enter your house from work. The TV will switch on as soon as your favorite program starts airing at a specific time. The system will automatically generate MONTHLY reports on electricity, water consumption, etc. This will help reduce cost and wastage of eneRGY."

"It can also act as a security system, by streaming the video from the CCTV camera at your house to your smartphone or computer, in real time. You can remotely lock doors too, if you forget in a hurry."

WHY CONNECT EVERYTHING?

Most of the data on the Internet comes from human beings. To put a photo online, someone has to take and upload it. But there are only so many human beings, and they only have so much time. The Internet of things would provide us with much more data.

imagine if each component in a car could monitor and report its own status in real time. Or imagine a farmer being able to sit down and see the health of each plant in their field along with historical conditions.

people have limited time, attention and accuracY, all of which means they are not very good at capturing data about things in the real world.

AND THAT'S A BIG DEAL

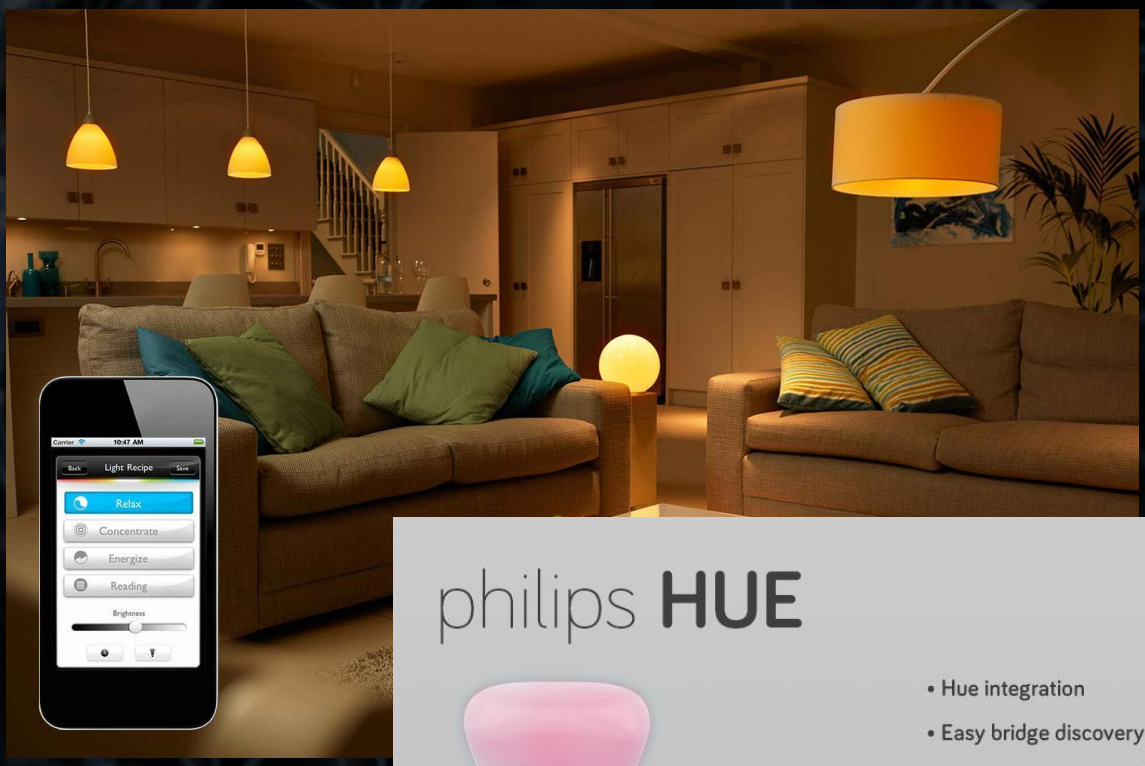


FIG. 2

A living room equipped with "smart" bulbs

FIG. 3

PHILIPS "HUE" SMART LIGHTBULBS

THE INTERNET OF THINGS ALSO REFERS TO EVERYDAY SCENARIOS

Philips has developed Philips Hue light bulbs that connect to the network so you can control them from smartphones.

Imagine if every appliance in our house was "smart" so we could have the information at our fingertips. We'd be able to see how long until coffee is ready, whether we left the lights on at home, and more. Because more devices become "smart" and networked, we could have our house automatically turn on the lights and turn on the AC when we come home by detecting where our smartphone is. **THIS IS THE DREAM OF THE "SMART HOME**," but it's also related to the Internet of things.

IT REFERS TO NETWORKING MORE DEVICES AND OBJECTS.

IPV6 : AN IDENTITY TO EVERYTHING

Currently, most devices use IPv4 to connect to the Internet. We're quickly running out of IPv4 addresses.

IPv6 solves this problem by providing a larger number of possible addresses we can use. Once we've actually migrated to IPv6, it will be possible for every object on the planet to have its own IP address.

Some have said that there will be more IPv6 addresses than there are atoms on Earth. Whether this is true or not, we'll have a huge amount of addresses to work with.

This means that **EVERYTHING ON THE PLANET COULD BE PUBLICLY ADDRESSABLE**.

In other words, everything on the planet could communicate with each other without worrying about network address translation and port forwarding.

FIG. 4

THE "NEST" THERMOSTAT WAS ONE OF THE FIRST DEVICES TO EMPOWER INTERNET OF THINGS AT HOME

HOW SECURE OUR INTERNET OF THINGS CAN BE ?

Security will be a challenge as we bring more and more devices online. The current home router technology has been found to be highly insecure. There have been numerous exploits performed to reveal sensitive data from most routers. This puts up a question - how could we secure each and every appliance an average person would have at home? Do we really expect all the manufacturers to support their devices with timely security patches and solid, secure code? And we're not even worrying about all the other sensors and networked devices we might have.

Security here is not an easy thing to implement, considering the huge number of manufacturers and devices. It all depends upon to security of devices for the Internet of things to not be a complete security mess.

FIG. 5

Songdo, South Korea, the first of its kind fully equipped and wired ubiquitous, or smart city is near completion. Nearly everything in this digital metropolis of smart homes is planned to be wired, connected and turned into a constant stream of data that would be monitored and analyzed by an array of computers with little, or no human intervention. Thus, Internet of Things, or embedded intelligence in things, with "smart systems that are able to take over complex human perceptive and cognitive functions and frequently act unnoticeably in the background" is a close reality.

[SOURCE : WIKIPEDIA]

EPILOGUE

Not all elements in an Internet of Things will necessarily run in a global space, they might run in a protected local area network accessible to a only a few persons, like home appliances at a house, or devices in a corporate system. While the same technologies are used as elsewhere, the system might only be running on and available via a local network and not the Internet.

The idea of “Internet of Things” may not be mature enough in the present, but it is gradually taking form as more and more devices are getting networked and sensors are become cheaper and cheaper. The Internet of the future won’t just be about people communicating; it’ll be about things communicating with each other.

THE NEW ERA TECHNOLOGIES

TECHNOLOGIES THAT HELP THE SOCIETY TO LEAD A BETTER AND IMPROVED LIFE

SAURAV DUTTA 4TH SEM. ELECTRONICS & COMMUNICATION ENGINEERING

TECHNOLOGY (FROM GREEK, TECHNE, "ART, SKILL, CUNNING OF HAND")
IS THE MAKING, MODIFICATION, USAGE AND KNOWLEDGE OF TOOLS, MACHINES, TECHNIQUES, CRAFTS, SYSTEMS AND METHODS OF ORGANIZATION , IN ORDER TO SOLVE A PROBLEM, IMPROVE A PRE-EXISTING SOLUTION TO A PROBLEM, ACHIEVE A GOAL OR PERFORM A SPECIFIC FUNCTION.

FUTURE TECHNOLOGY IS BEYOND THE REALITY OF SCIENCE AND TECHNOLOGY. FUTURE TECHNOLOGY IS COMPLETELY AND ESSENTIALLY DIFFERENT WITH HIGH-TECH, THE LATEST TECHNOLOGY AND CUTTING-EDGE TECHNOLOGY. THE LATTER REPRESENTS JUST AN ADVANCED HUMAN INVENTION CREATED AND BEEN ABLE TO MASTER AND USE RECENTLY.

FUTURE TECHNOLOGY EMPHASIZES HUMAN EXPECTATIONS OR UNFORESEEN THINGS.

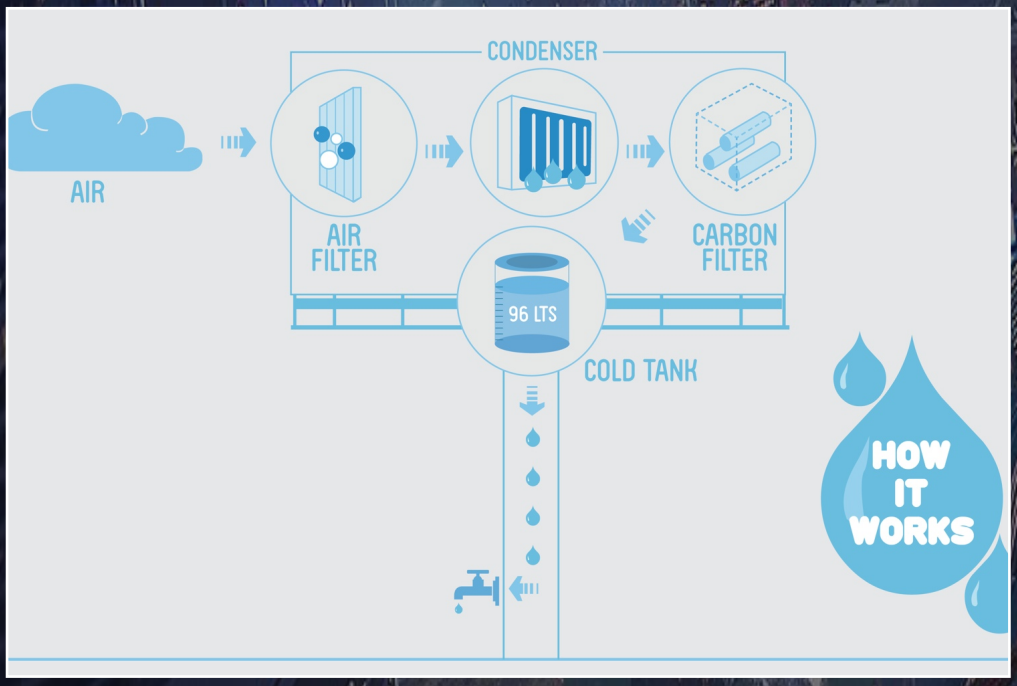
FUTURE TECHNOLOGY LARGELY FOCUSES ON IMPLEMENTING REAL-TIME SCENARIO. IT SHAPES DIFFERENT FIELDS LIKE MEDICAL TECHNOLOGY, BUSINESS TECHNOLOGY, EDUCATIONAL TECHNOLOGY AND GREEN TECHNOLOGY WITH SUITABLE APPPLICATIONS. IN NEAR FUTURE THERE WILL BE NO NEED TO REGULARLY VISIT DOCTORS, THERE ARE SOME GADGETS WHICH CAN HELP HUMANKIND TO LIVE TO THE FULLEST.

WE ARE IN FAST CHANGING WORLD WHERE NEW TECHNOLOGY IS EMERGING LIKE RAINFALL. EVERY DAY WE HEAR ABOUT NEW INNOVATIONS AND UP-GRADATION OF PREVIOUSLY EVOLVED TECHNOLOGY. HERE ARE SOME OF THE MODERN GADGETS AND TECHNOLOGIES WHICH I HAVE SHORTLISTED, WHICH WILL EVENTUALLY CHANGE THE WORLD WE LIVE IN, SOME OF THEM ARE DUE IN VERY NEW FUTURE, SOME OF THEM ARE ALREADY IN THE REAL WORLD AND REST ARE ALREADY IN ITS TESTING PHASE.

A BILLBOARD THAT PRODUCES DRINKABLE WATER FROM AIR

LOCATED IN LIMA, PERU, IT PRODUCES AROUND 100 LITRES OF DRINKABLE WATER IN A DAY. LIMA WHICH IS LARGEST CITY IN PERU, LOCATED IN THE VALLEYS OF THE CHILLON, RIMAC AND LURIN RIVERS NEAR PACIFIC OCEAN. DUE TO LIMA'S LOCATION IT RECEIVES 100% HUMID AIR DURING MORNINGS AND AROUND 80-90% DURING DAY TIME. BILLBOARD ABOVE REQUIRES LITTLE ELECTRIC TO RUN ITS REVERSE OSMOSIS FILTRATION SYSTEM. WATER FROM HUMID AIR TRAPS IN THE BILLBOARD AND GOES THROUGH VARIOUS STAGES TO A TAP AT BOTTOM OF THE BILLBOARD.

THE BILLBOARD READS "A PANEL THAT PRODUCES POTABLE WATER OUT OF AIR IS INGENUITY IN ACTION."



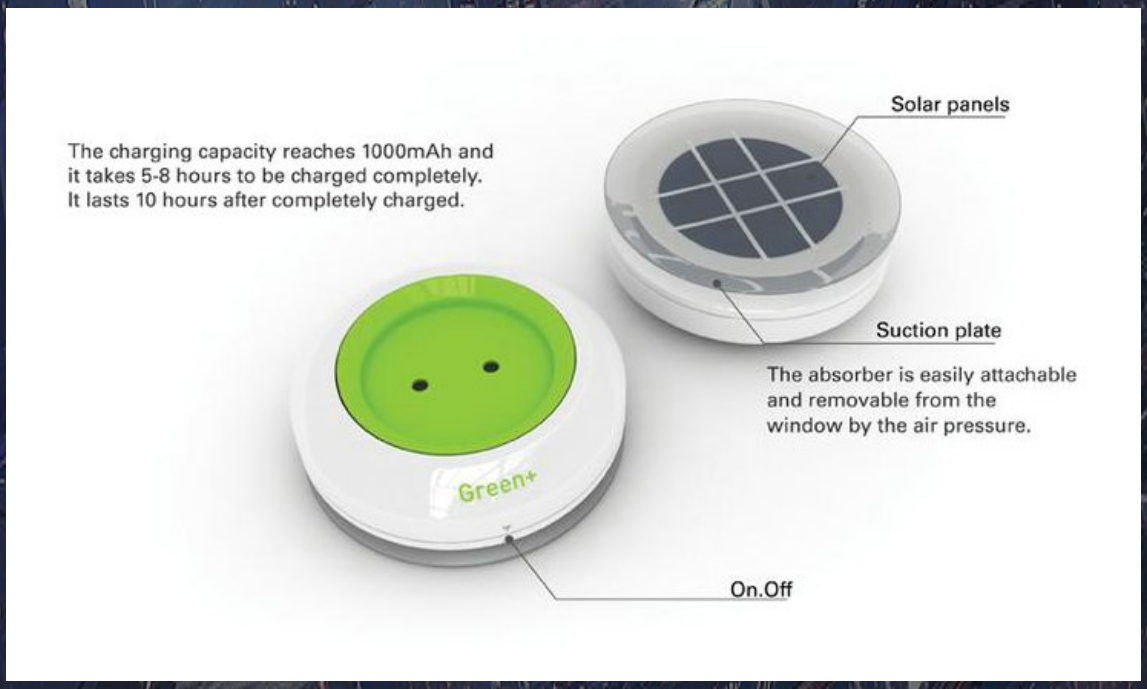
REVERSE OSMOSIS IS WHAT POWERS THE FILTRATION SYSTEM OF THIS BILLBOARD

SOLAR-POWERED WINDOW SOCKET

SOMETIMES, THE OUTLETS IN A GIVEN ROOM JUST AREN'T PLACED STRATEGICALLY FOR OUR HIGHLY DIGITALIZED LIFESTYLE. DON'T LET YOUR LAPTOP BATTERY RUN OUT BEFORE YOU'RE ABLE TO FIND AN AVAILABLE WALL OUTLET! CONVENIENCE AND SUSTAINABLE LIVING CONVERGE IN THIS SOLAR ENERGY WINDOW SOCKET. THE DESIGN IS SIMPLE AND THE DEVICE IS EASY TO USE. JUST ATTACH THE SOCKET TO ANY WINDOW AND THE ROUND POD AUTOMATICALLY SERVES AS AN ELECTRICAL OUTLET. THERE IS EVEN AN ON/OFF MODE TO CONSERVE ENERGY OR RECHARGE. EACH SOCKET REQUIRES 5 TO 8 HOURSE TO BE CHARGED COMPLETELY, AND THE ENERGY LASTS FOR UP TO 10 HOURS!

THE SOCKET STICKS TO ANY GLASS WINDOW THROUGH A TRANSPARENT SUCTION PAD

THE SOLAR PANEL ON THE REAR OF THE SOCKET PROVIDES POWER TO BATTERY INSIDE. IT TAKES 5-8 HOURS FOR A FULL CHARGE AND BATTERY LASTS 10 HOURS.



FITBIT'S FLEX

FLEX IS A WRIST BAND WHICH GIVES DETAIL INFORMATION ON YOUR DAILY ACTIVITIES SUCH AS HOW MUCH STEPS HAVE YOU TAKEN, HOW MUCH YOU HAVE SLEPT, TOTAL CALORIES BURNT, QUALITY OF YOUR SLEEP AND TOTAL DISTANCE TRAVELLED. FLEX IS ALSO WATER RESISTANT AND HAS AN ALARM CLOCK.

FITBIT'S FLEX IS A PERFECT GADGET FOR THOSE WHO WANT TO KEEP TRACK OF THEIR DAILY HEALTH ROUTINE. YOU CAN MONITER ALL YOUR ACTIVITIES ON YOUR SMARTPHONE AND PC.

FITIBIT FLEX WITH ACCOMPANYING WRISTBAND

SAVE ONE LIFE

MOST OF US ARE LUCKY ENOUGH TO LIVE IN PEACEFUL PLACES WHERE LANDMINES DON'T THREATEN OUR LIVES ON A DAILY BASIS. UNFORTUNATELY, MANY PEOPLE STILL LIVE IN FEAR OF STEPPING ON LANDMINES AND LOSING THEIR LIMBS-OR WORSE, THEIR LIVES. WELL AWARE OF THIS FACT, DESIGN FIRM LEMUR STUDIO CAME UP WITH A LANDMINE DETECTOR CALLED "SAVE ONE LIFE" THAT FITS RIGHT INSIDE A PERSON'S SHOE.

AS DESIGNED, IT WILL USE A SMALL COIL OF CONDUCTIVE MATERIAL THAT PRODUCES AN ELECTROMAGNETIC FIELD. THIS IS KEY TO HOW IT WORKS, AS THIS FIELD WILL BE ABLE TO INTERACT WITH THE ELECTROMAGNETIC FIELD OF THE LANDMINES. WHEN A LANDMINE IS DETECTED, THE USER WILL GET AN ALARM ON THE ARMBAND THAT WORKS IN CONJUNCTION WITH THE SOLE-HOPEFULLY BEFORE THEY STEP ON ONE.

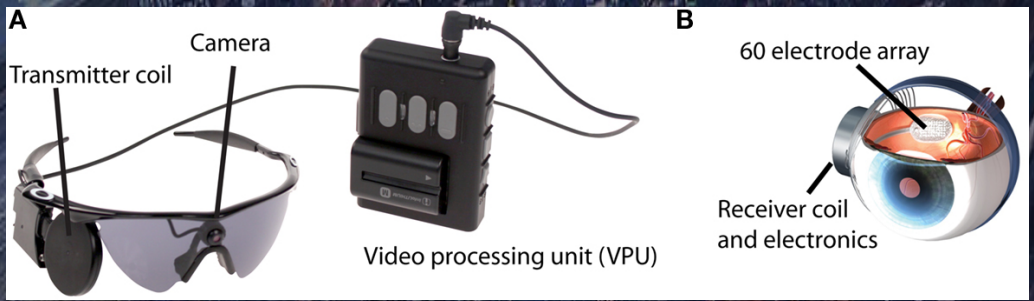
SAVE ONE LIFE SHOE AND ARMBAND

ARGUS II RETINAL PROSTHESIS SYSTEM

ARGUS II IS WORLD'S FIRST BIONIC EYE WHICH RESTORES SOME VISION FOR PEOPLE SUFFERING FROM BLINDNESS. ARGUS II CONSISTS OF TWO DEVICES ONE IS SURGICALLY IMPLANTED ON EYE AND OTHER IS VIDEO PROCESSING UNIT(VPU) WHICH INCLUDES GLASS WITH A CAMERA IN THE CENTRE. VIDEO CAMERA ATTACHED TO A PAIR OF OAKLEY GLASSES CAPTURES AN IMAGE AND THIS IMAGE IS THEN TRANSFERRED TO THE VPU. VPU THEN PROCESS AND CONVERTS THIS IMAGE INTO INSTRUCTION AND SENDS TO THE IMPLANT ANTENNA WIRELESSLY. THESE INSTRUCTION ARE PASSED TO ELECTRODE ARRAY WHICH EMITS SMALL PULSES OF ELECTRICITY AND THUS THIS INFORMATION IS PASSED TO THE BRAIN THROUGH OPTIC NERVE.

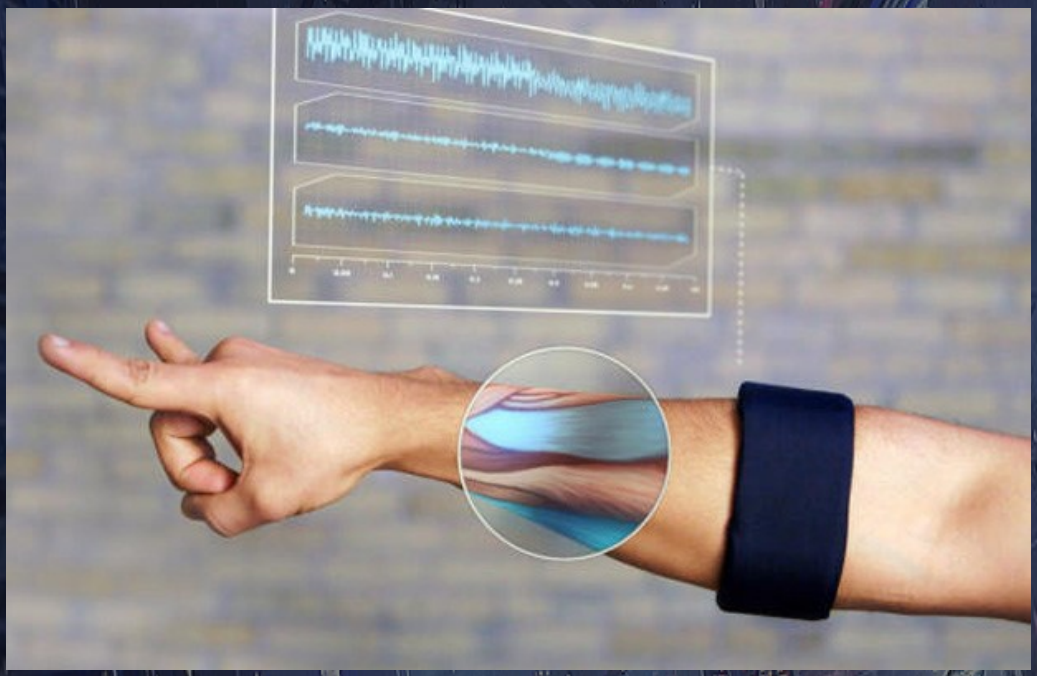
THIS DEVICE GIVES BASIC FORM OF VISUAL ABILITY TO THE PEOPLE SUFFERING FROM BLINDNESS. IN SOME CASES, USER CAN READ LETTERS AND DISTINGUISH BETWEEN BLACK AND WHITE.

ARGUS II WORKING IDEA
TRANSMITTER COIL TRANSMITTING IMAGE TO VPU



MYO

DUBBED AS “THE NEXT GENERATION OF GESTURE CONTROL”, THE MYO IS AN ARMBAND FULL OF MOTION AND MUSCLE SENSORS THAT IS ABLE TO PICKUP ON THE ELECTRICAL ACTIVITY IN YOUR MUSCLES TO WIRELESSLY CONTROL YOUR ELECTRONICS VIA BLUETOOTH. ACCORDING TO THE COMPANY, THE DEVICE WILL WORK WITH WINDOWS AND MAC OS, WITH IOS AND ANDROID SUPPORT COMING SOON. WE’RE NOT FUTURISTS, BUT IF WE WERE TO GUESS AT HOW WE WILL CONTROL OUR HOME IN THE FUTURE, IT LOOKS VERY SIMILAR TO THIS.



MYO MONITORING ELECTRICAL ACTIVITIES IN MUSCLES

TINY BLOOD TESTING LABORATORY

SCIENTIST FROM EPFL HAS DEVELOPED A TINY BLOOD TESTING LABORATORY WHICH WILL PROVIDE IMMEDIATE ANALYSIS OF SUBSTANCES IN THE BLOOD AND SENDS THIS VALUABLE RESULT TO A DOCTOR OVER CELLULAR NETWORK. THIS DEVICE CAN BE ENORMOUS ACHIEVEMENT IN THE FIELD OF MEDICAL TECHNOLOGY.
A TINY DEVICE IS IMPLANTED JUST BELOW THE SKIN AND IT DETECTS SUBSTANCES IN THE BLOOD AND TRANSMITS THE RESULTS TO DOCTOR'S COMPUTER. DEVICE CAN ALERT EVEN BEFORE THE SYMPTOMS EMERGES AND IT IS USEFUL IN CHEMOTHERAPY APPLICATIONS.

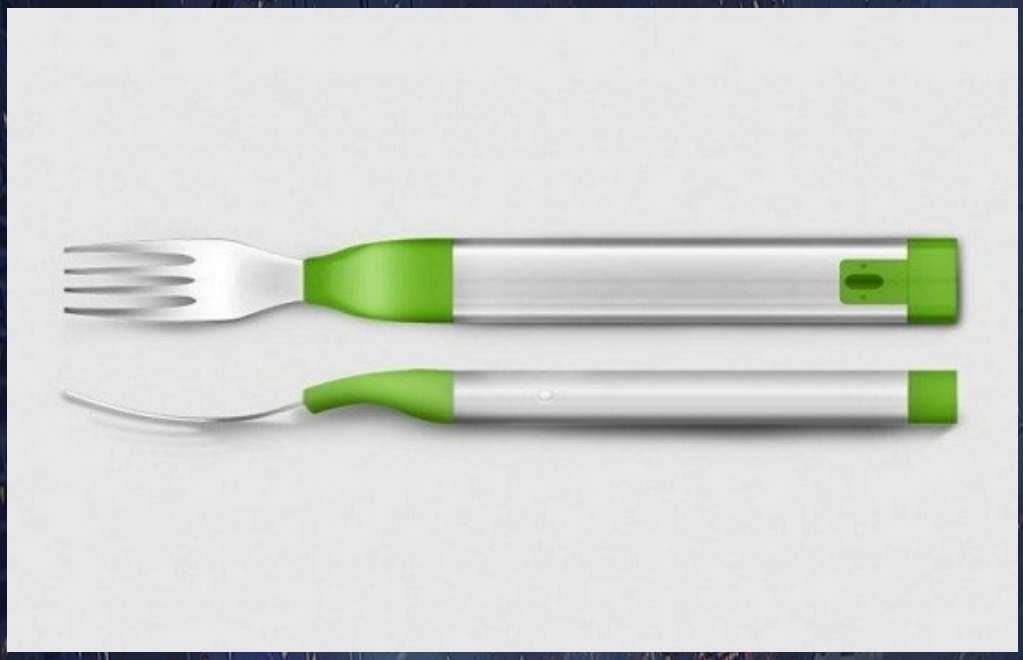
LIFECOMM EMERGENCY WATCH, WHICH IS EQUIPPED WITH EMERGENCY ALERT BUTTON, GPS SYSTEM AND MOTION SENSORS. PUSH THE PANIC BUTTON AND THIS DEVICE WILL BE CONNECTED TO THE NEAREST PRIVATE ASSISTANT TEAM. ITS MOTION SENSOR CAN EVEN TELL WHEN A PERSON HAS FALLEN AND DOES NOT RESPOND, IN THIS CASE IT TRANSMITS PERSON'S LOCATION TO CARETAKER OR FAMILY MEMBERS. EMERGENCY WATCH USES CELLULAR COMMUNICATION WHICH MAKES IT EASY TO SEND DISTRESS SIGNAL TO FAMILY MEMBERS OVER MOBILE NETWORK.

LIFE COMM EMERGENCY WATCH SENDS DISTRESS SIGNAL TO FRIENDS AND FAMILY OVER MOBILE NETWORK AND WIRELESS

HAPIFORK

HAPIFORK IS AN ELECTRONIC FORK WHICH TRACKS AND ANALYSE YOUR EATING HABITS BY ALERTING WHEN YOU ARE EATING TOO FAST. IT ALSO KEEPS TRACK OF VALUABLE INFORMATION SUCH AS TIME TAKEN TO EAT, AMOUNT OF FOOD IN YOUR FORK, ETC. INFORMATION GATHERED IS THEN UPLOADED TO ONLINE DASHBOARD VIA USB WHERE YOU CAN TRACK YOUR PROGRESS.

EATING TOO FAST CAUSES MANY HEALTH PROBLEMS SUCH AS WEIGHT GAIN, INDIGESTION AND GASTRIC ISSUES. IT IS PROVEN THAT BY EATING SLOW YOU CAN AVOID THESE PROBLEMS. YOU CAN MONITOR YOUR PROGRESS IN HAPILABS MOBILE APP.



THIS HAPIFORK ENCOURAGES HEALTHY FOOD HABITS AND PROMOTES GOOD HEALTH

Passive Vibration Control of Structural Systems

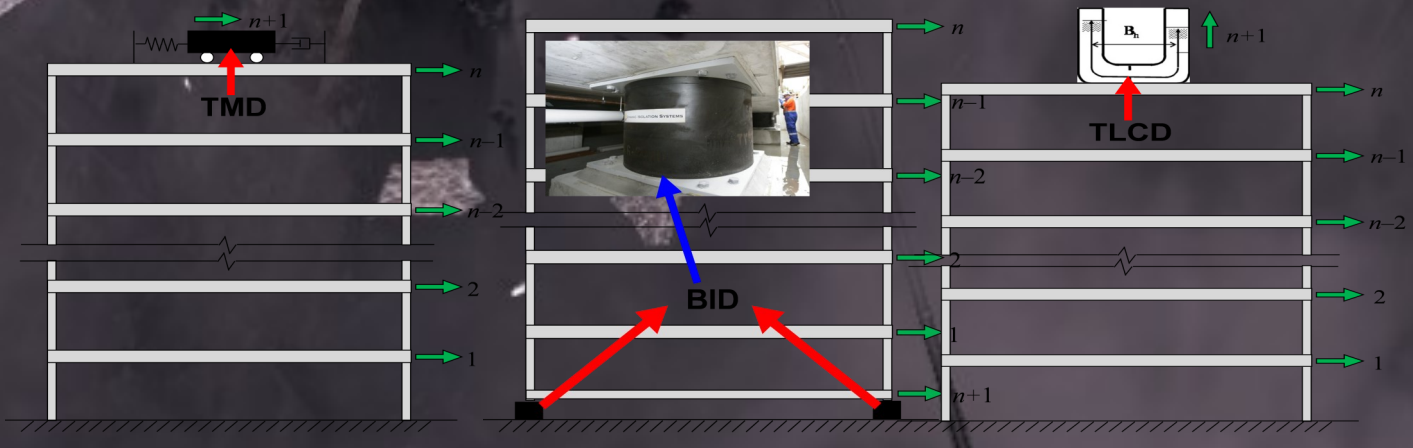
(Nirmalendu Debnath, Assistant Professor, Department of Civil Engineering.)

Various structural systems (e.g. buildings, bridges, towers etc) may be subjected to dynamic loads in the form of wind, earthquakes, traffic, blasts etc. Such dynamic loads have demonstrated numerous devastating actions on many structures in different parts of the world in the past. Moreover, dynamic loads hamper the serviceability of structures: rarely anyone will like to stay in a high-rise building which is under significant range of vibration under usual wind actions. Therefore, mitigation of vibration of structural systems has been evolved as a matter of great interest to the engineering community.

Structural vibration control is usually classified as: (a) Passive control, which is performed solely with structural modification without any requirement of external energy (b) Active control, which is performed applying external energy in the form of control force (c) Semi-active control, which is performed by developing control forces in the form of changing the mechanical properties of devices at a very lesser requirement of external energy.

The passive vibration control is quite interesting in view of their major advantages: (i) simple as well as reliable (ii) non-dependent on external energy requirement, thus consistent against power-failure. The major passive vibration control devices are:

(a) Tuned mass damper (TMD) (b) Base isolation device (BID) (c) Tuned liquid column damper (TLCD). Tuned mass damper is typically a system of secondary masses attached to the primary structural system with springs and dampers [Fig. 1 (a)]. Base isolation system is a popular passive control device to mitigate vibrations subjected to earthquake excitations. It physically isolates the structural system from earthquake forces using a large set of base isolation devices which sit between the foundation and the structural system [Fig. 1 (b)]. A TLCD is a U-shaped liquid column tube attached to the primary structure [Fig. 1(c)]. Basic motive behind applications of all these devices is to reduce the intensity of frequency response function (FRF) between input and output. There have been many installations of passive control devices in various important structures e.g. installation of TMD system in Shanghai world financial centre, Taipei 101 skyscraper (Taiwan), Burj al-Arab (UAE), Akashi-Kaikyō Bridge (Japan); installation of BID in Los Angeles City Hall, San Francisco City Hall



(a) (b) (c)

Fig. 1. A *n*-storied shear fame associated with typical (a) TMD (b) BID (c) TLCD. Degrees of freedom for vibration are indicated using 1, 2, … *n*–2, *n*–1, *n* and *n*+1.

Passive control devices are well understood and are widely accepted by the engineering community for mitigating the effects of dynamic loading on structures. However, these passive control techniques are also associated with limitations like difficulties for adaptation to structural changes, to varying loading conditions. Further improvement of robustness of various passive control devices is therefore an area

STUDENT TEACHER RATIO

A BRIEF INSIGHT

DR. PRABIN HALOI ASSISTANT PROFESSOR, MECHANICAL ENGINEERING

Student- teacher ratio or student faculty ratio (S/F ratio) is an often discussed agenda concerning educational institutes covering it from pre-primary school to higher educational institutes.

What is it? It is usually defined as the number of students assigned per teacher. The S/F may be evaluated at different levels in an institute of higher education. It may be done at institute level, school level and at department level as well. Going for such calculations often provide an imbalanced ratio among these. Based on above definition, a high S/F is an indicator of low individual attention to students, low students performance whereas may indicate more faculty, better attention, more research output expectations. But too high or too low ratio has always been disadvantageous to both students and teachers. According to some, a high ratio is welcome more at pre-primary school where we expect children to learn socializing and form groups. While at higher education level a low ratio is expected as more and proper attention is sought as it is the place from where a student has to find a place in the practical and real workforce of the world.

The S/F ratio is also usually supposed to reflect the classroom size. There are institutes proposing a high S/F ratio by the engagement of postgraduate students in classroom assistance and hence more students intake. But how the S/F ratio helps to serve the objective in practical situation should be a matter of evaluation.

Say, on an average, a class of 60 students is addressed by a faculty and the S/F is say a high of 20, then what will be the real relation between the two? Maintenance of such a ratio might seek more small size classroom infrastructure and more faculty or postgraduates. Division of a single complete course among two or more faculties who could undertake such a course on a full scale to make ratio objective practically possible. Improving number of teachers based on above mode may result in a fall of S/F ratio which may highlight a negative point in certain circumstances, if we stick to the above definition. Dividing the total number of students by total faculty, to say, in a department may give a good picture. A ratio of 15:1 or 10:1 is considered a good ratio in many institutes. The practical difficulty to make such ratio fruitful might have been ignored. Yet, it is time that the definition may be evaluated more elaborately. Clarity may be required to understand its proper meaning and its implementations in practical situations.

How To.....?

(Koushik Kiran Kumar, 2nd sem ,ECE)

Wanna try something cool with ELECTRONICS? Here is some stuff you could do yourself and take a detour from regular projects ....

Programmable Home Security Alarm System

In this project we design low cost high performance programmable home security system using few LDR's as an input sensors. When above sensor(s) get triggered system may dial the user specified phone number (using build-in DTMF generator) and activate the high power audio alarm and lights. All the parameters of DTMF

generator, audio alarm and light interface are programmed through the RS232 serial interface.

Current firmware of this system presents interactive control system through the RS232 interface. This control system consist with the menu driven configuration options, self tests, system report generators, etc.

This system also contain 5W (with 4Ω speaker) audio alarm with three selectable tone configurations, which include Police siren, Fire engine siren and Ambulance siren.

SYSTEM FEATURES

- **Touch tone phone dialing interface**
- **5W High powerful audio alarm**
- **2 sensor interface with separate sensitivity adjustments**
- **Programmed through the RS232 interface**
- **Build-In intelligent light ON/OFF switch**

Integrated Circuits

This system uses a Microchip's PIC16F877A as a main controller, LM339 as sensor interface, UM3561 as a tone generator and µPC2002 as a speaker driver (audio amplifier). LM7805, LM7812 and LM317 voltage regulators are used to obtain +5V, +12V and +3V respectively.

External connectors and controls

DC Power input : Attach DC power supply with 18V - 25V (2A Max.) output.

RS232 Connector : Connect RS232 serial cable to the port to configure the system. Do not use RS232 Null Modem cable with this port.

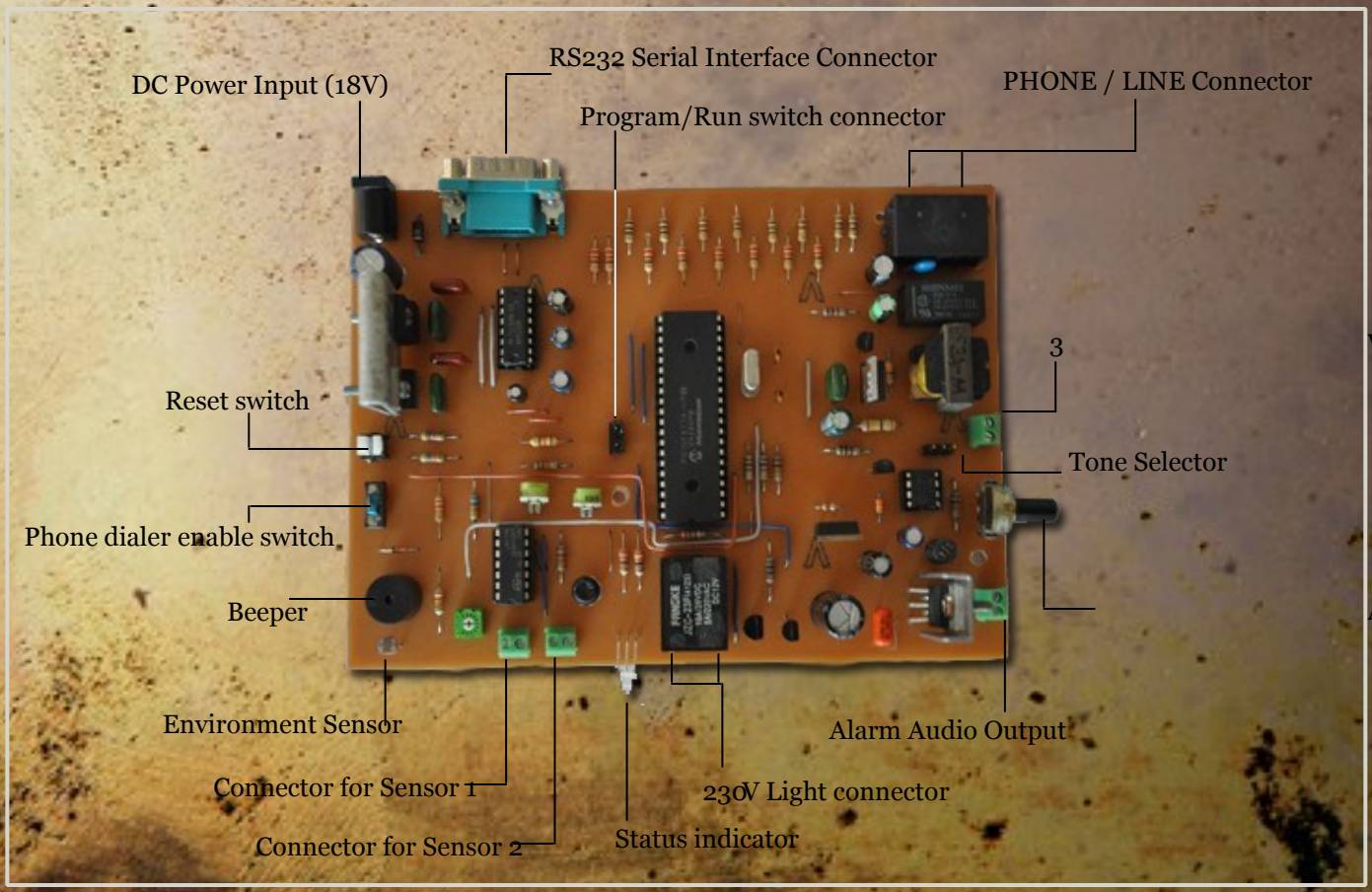
PHONE/LINE connector : Attach standard RJ12/RJ11 telephone cable connector to this port. One port is need to use with the phone line and remaining port is for the phone (and it is optional).

3V LASER supply : 3V supply line for LASER diode assembly.

Connectors for Sensor 1/2 : Attach high sensitive LDRs for these ports. To get the maximum sensitivity it is recommended to use *EG&G VACTEC* LDRs.

Status Indicator : Indicate run, program and sensor trigger modes.

Reset Switch : Press this button to reset entire alarm system. This button enable only when the audible alarm



get activated. It is not possible to use this function at the phone dialing/ringer states.

Phone dialer enable switch : Turn on this switch to enable the phone dialing feature of this system.

Environment Sensor : In-circuit LDR to detect light conditions of the environment.

Alarm Volume Control : Use this to control the output power (volume) of the audible alarm.

230V Light connector : Attach 230V AC light (or related peripheral) to these terminals.

Tone Selector : Configure the master alarm tone from this jumper as follows,

1—2 : Fire Engine Siren

2—3 : Ambulance Siren

Open : Police Siren

(Do not connect jumper terminal 1—3, this combination may permanently damage the entire system)

Beeper : Produce beeps (e.g: at the input error, etc.)

Program / Run Switch connector : Attach switch to this header to select Program or Run mode.

Alarm Audio Output : Attach 8Ω (8W) or 4Ω (10W) speaker to this connector.

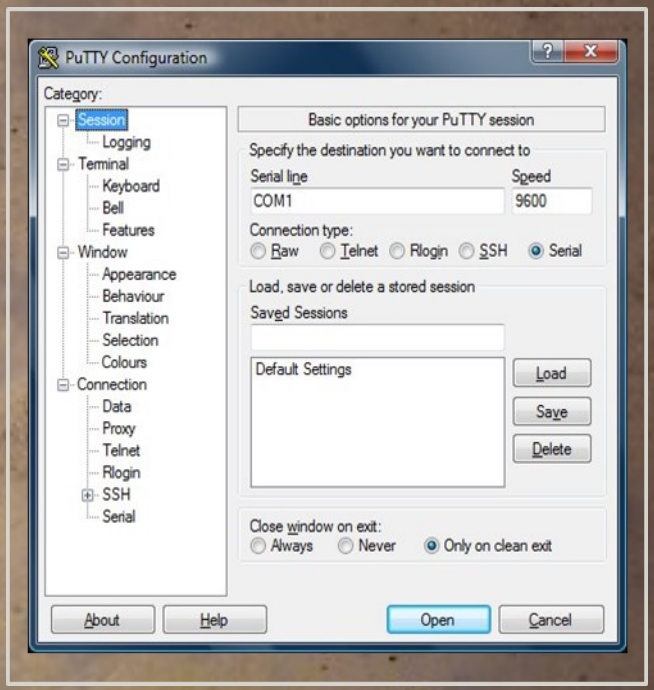
Calibration and Testing

Once everything is assembled take following steps to calibrate the system,

- Remove IC1, IC2, IC3 and IC4 from the IC bases.
- Apply 18V (to 22V Max.) DC source to the power connector (J3).
- Check the voltage between .

Pin12 (GND) and Pin3 of IC2. It need to be 4.8V - 5.1V DC.

- Check the voltage between GND and E$4 jumper. It need to be 11.7V - 12.3V DC.
- Check the voltage between Pin1 and Pin3 (GND) of JP1. It need to be 2.5V - 3.1 V
- If all the above Step 3, 4 and 5 are correct, disconnect the power supply and insert IC1, IC2, IC3 and IC4 in to the appropriate IC bases. Attach suitable speaker to the X4 and connect RS232 cable to the system.
- Close the jumper J2 (Program Mode) and power on the system.
- Download and install PuTTY on to the target computer and setup the "Serial" connection with 9600 baud rate
- Press "2" and enter into the "Parameter Setup" mode. Configure all the parameter options with the appropriate settings.
- Attach phone line to the PHONE/LINE connector and fix photoelectric LDR sensors to the X1 and X2



PuTTY configuration setup

connectors.

- Press "3" and execute "Self Test".

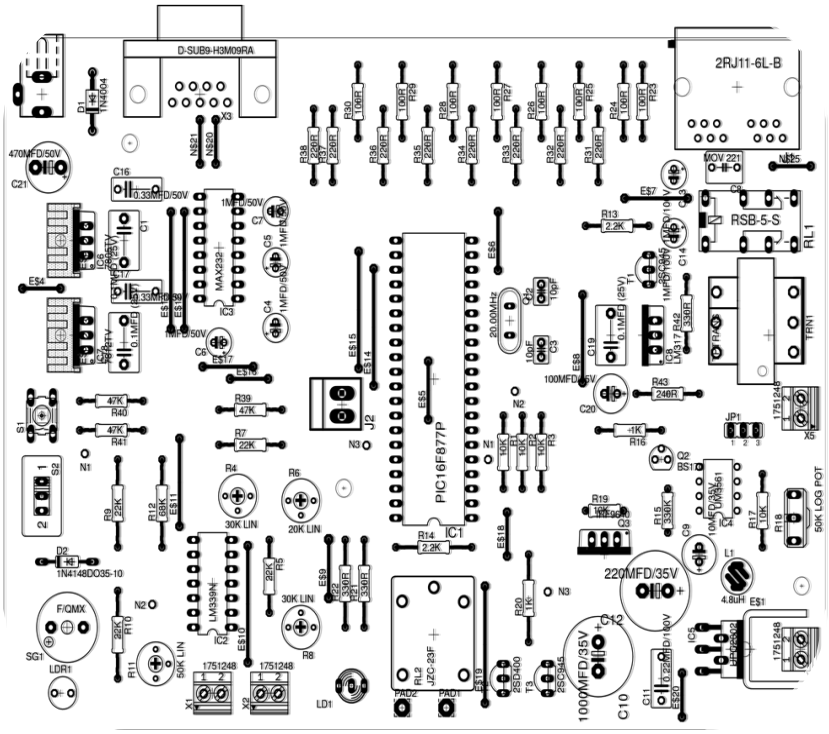
- Adjust R11 preset to control the “Day” and “Night” mode

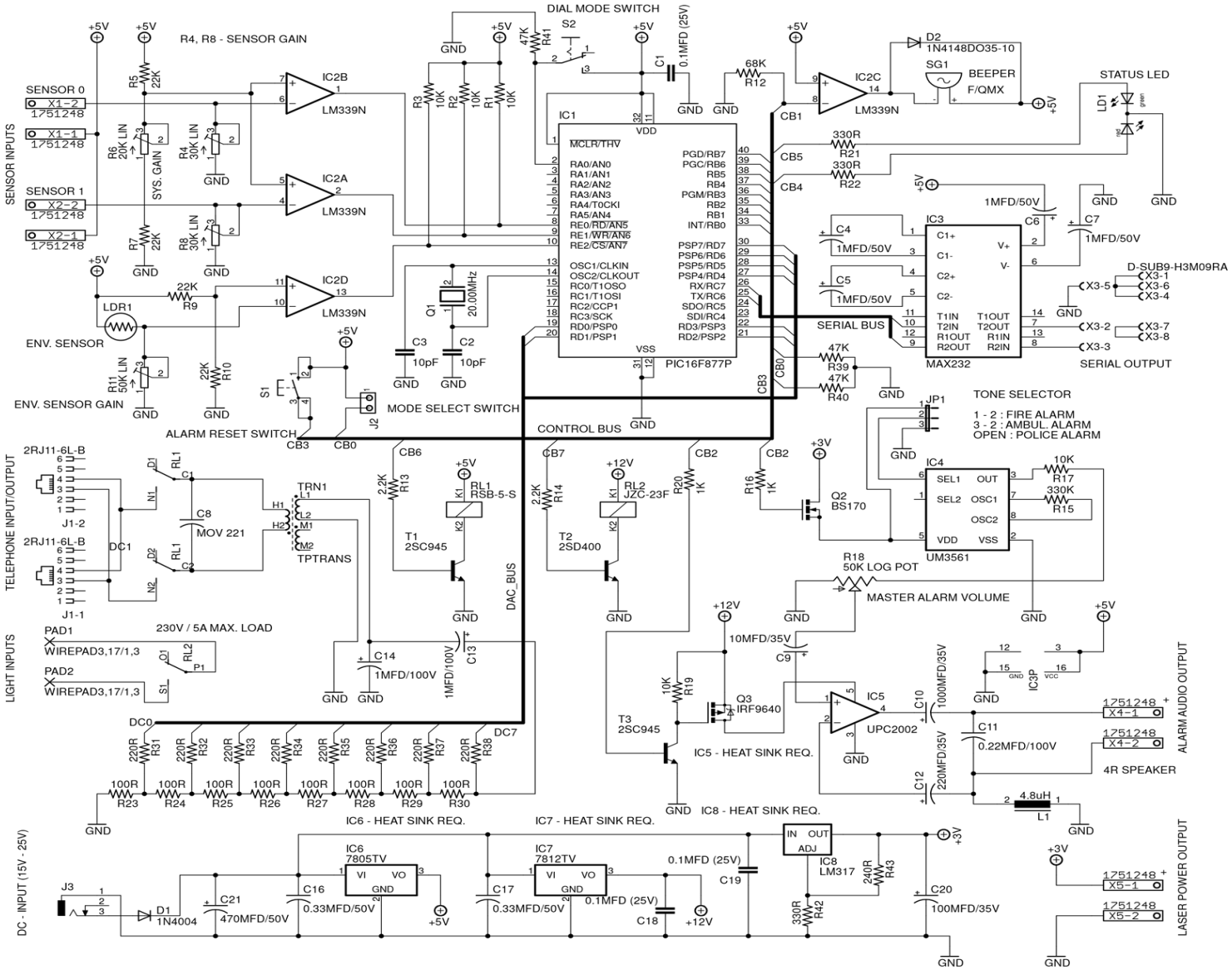
Parts List

C1, C18, C19	0.1µF (25V)
C2, C3	10pF
C11	0.22µF (100V)
C16, C17	0.33µF (50V)
C4, C5, C6, C7	1µF (50V)
C13, C14	1µF (100V)
C9	10µF (35V)
C10	1000µF (35V)
C12	220µF (35V)
C20	100µF (35V)
C21	470µF (35V)
R1, R2, R3, R1, R19	10K
R5, R7, R9, R10	22K
R12	68K
R13, R14	2.2K
R15	330K
R16, R20	1K
R21, R22, R42	330Ω
R23, R24, R25, R26, R27,R28, R29,	100Ω
R31, R32, R33, R34, R35, R36, R37,	220Ω
R39, R40, R41	47K
R43	240Ω (0.5 W)
TRN1	600Ω : 600Ω isolation transformer
SG1	F/QMX Buzzer
RL1	SHINMEI RSB-5-S Relay
RL2	FANGKE JZC-23F 12V Relay (220V 5A)
S1	B3F-10XX - push on switch
S2	M251 SPDT micro switch

IC1	PIC16F877A
IC2	LM339N
IC3	MAX232
IC4	UM3561
IC5	µPC2002 / TDA2002
IC6	7805TV
IC7	7812TV
IC8	LM317
D1	1N4004 Diode
D2	1N4148 Diode
C8	VE09-0151 MOV
T1, T3	2SC945
T2	2SD400
Q2	BS170
Q3	IRF9640
Q1	20.00MHz Crystal
R4, R8	30K (LIN) Potentiometer
R6	20K (LIN) Potentiometer
R11	50K (LIN) Potentiometer
R18	50K (LOG) Gang Potentiom-
L1	4.8 µH Inductor
LDR1	VT90N2 LDR
LD1	5mm Tri-Color LED
JP1	3 Pin Jumper Header
J1	Tyco Electronics 2RJ11-6L-B
J2	1X2MTA header
J3	DCJ0303 DC Jack connector
X3	H3M09RA D-SUB9 connect-
X1, X2, X4, X5	Phoenix 350 connector
SPK	8Ω (8W) or 4Ω (10W) Speak-

CIRCUIT DIAGRAMS





Cricket On Board

(Koushik Kiran Kumar, 2nd sem ,ECE)

Are you passionate towards CRICKET? Don't have time to play? Why to kill your passion towards cricket due to busy life .....

Here is a very interesting project not for only who love cricket, for also who love to watch this game. The game electronics cricket on board can be played by anyone even in their home by sitting on table. The interesting fact is even a single player can play this game.

Circuit description of electronics ***Cricket On Board***

This electronics game circuit cricket on board is design by most popular IC LM555 and decade counter IC CD4017 from CMOS family. IC_1 555 timer IC, forms the heart of circuit used as clock pulse generator. Generated clock pulse is fed to pin 14 of IC_2 CD4017. Output is obtained from pin number 3, 2, 4, 7, 10, 1, 5, 6, 9, 11 by connecting LED to each pin as shown in circuit diagram. To

play this game switch SW_1 are placed in on position (or pushed). All 10 LEDs are in on mode. But when we release switch SW_1 last pulse only lit up one LED which is the game result. Now compare the result of cricket on board to chart and write your score in score boards, lastly count your all run.

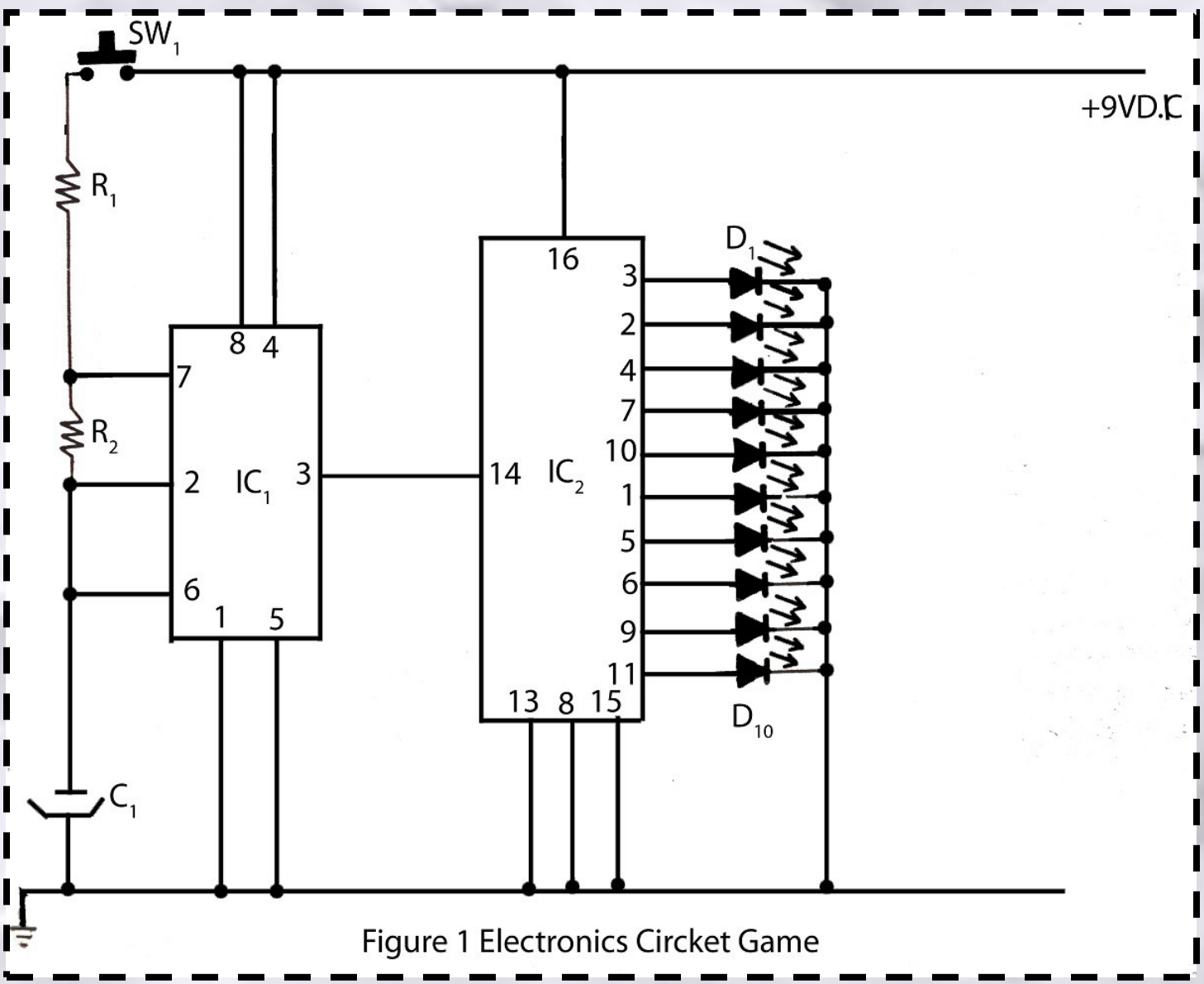


Figure 1 Electronics Circket Game

PARTS LIST

Resistors (all ¼-watt, ± 5% Carbon)

R_1, R_2, = 10 KΩ

Capacitor

C_1 = 0.1 µF/50V

Semiconductors

IC_1 = NE555 Time IC

IC_2 = CD4017

GAME RESULT

Catch Out	LED 1
Stamp Out	LED 2
Bold Out	LED 3
Leg By	LED 4
Single Run	LED 5
Two Run	LED 6
Four Run	LED 7
Sixer	LED 8
Wide Ball	LED 9
No Ball	LED 10

Gesture Recognition: The Next Big Thing for Smartphone After Touch?

(KOUSHIK KIRAN KUMAR, B.TECH ,ECE)

Do you think it's actually time for those front-facing cameras on smartphones to be used for more than just video-chatting or for clicking low-resolution pictures for self portraits and other things? Are people ready for Kinect-like gesture control on their cellular phones?

There are thousands of models of cell phones that have hit the streets, all with varying specialties and features. Today, mobile phones are the most widely used and must-have electronic gadgets. In recent years, we have also seen considerable progress in terms of how users can interact with mobile phones evolving all the way from QWERTY keyboards to touch screens. What could be next? Over the past two years, we have seen smartphones explode in their use and capabilities. From entertainment, to work or even to family duties, we now rely on these devices in almost every aspect of our lives. There is, however, still room for our experience with them to be enhanced. Touch was the last great user-interface advancement and hand gesture recognition for mobile phones will be the next.

Gesture recognition is perceived today as the natural evolution of intuitive user interfaces. Since the creation of touch screens, gestures have reigned in an entirely new aspect as to how we interact with our devices. Gestures allow users to perform specific tasks in an extremely efficient and more dynamic manner.
Some of the most used gestures are swipe to unlock, pinch to zoom and pull to refresh. While those are relatively basic by most means, gestures have evolved greatly. There are a number of different companies trying to push forward with touch-free gesture controls. Third party developers have began to truly utilise the potential that multi-touch displays hold, all within their apps. Gestures can offer an intuitive way to interact with a mobile phone. It is almost similar in concept to Microsoft's Xbox Kinect but on a much smaller scale.

What is GESTURE RECOGNITION?

Gesture recognition is Interface with computers using gestures of the human body, typically hand movements. In gesture recognition technology, a camera reads the movements of the human

Zooming in and out using Gesture Recognition Technology

body and communicates the data to a computer that uses the gestures as input to control devices or applications.

Adding a whole new dimension to multimedia

By adding touch-free to

functionality to smartphones, there's a brand new dimension to mobile games and applications. We can now take advantage of the Z-axis by using simple hand shapes to enable reality-like experiences. A few examples of supported actions in games include bowling, throwing darts, playing rock-paper-scissors and more.

According to eyeSight, gestures are useful at times when touch input is impractical such as when driving or wearing gloves. Using the front-facing camera and eyeSight's software help smartphone owners to control their phones by waving their hand. Among the functions able to be done via gesture will be answering calls and playing music.

Natural hand gesture recognition is an upcoming user interface capability. Along with natural language recognition such as Siri or Google Now, we are seeing a major user interface evolution similar to the one which occurred when touch screens were introduced in mobile devices," said Amnon Shenfeld, eyeSight's VP R&D

Applications of Gesture Recognition Technology in Today's Mobile Phones

Few examples of cases, which are enhancing the user experience compared to what is available today are:
1. Call control- answer an incoming call (speaker-ON) with a wave of the hand while driving.
2. Skip tracks or control volume on your media player using simple hand motions- lean back, and with no need to shift to the device- control what you watch/ listen to.
3. Scroll Web Pages, or within an eBook with simple left and right hand gestures, this is ideal when touching the device is a barrier such as wet hands are wet, with gloves, dirty etc. (we all are familiar with the annoying smudges on the screen from touching).
4. Another interesting use case is when using the smartphone as a media hub, a user can dock the device to the TV and watch content from the device- while controlling the content in a touch -free manner from afar.

However all is not simple...

There are a lot of people who question the need for touch less interaction on a device that's designed to be in your hand at all times! The use case for touch-less gestures on a mobile device are incredibly few and far between. The only reason to ever have to use touch less gestures on smartphone or tablets would fall into just one category: touch-free means smudge-free.

If your hands are dirty or a person hates smudges, touch-free controls are a benefit, but beyond that, there is little reason to need touch-less gesture controls.

Hands are designed to touch and manipulate things. Moreover, a key limitation to this technology is that it only recognises motions, such as a hand flick or circular movement, within a six-inch range. Power consumption is a key issue for battery-powered devices.

Several challenges remain for gesture recognition technology for mobile devices, including effectiveness of the technology in adverse light conditions, variations in the background, and high mpower consumption. However, it is believed these problems can be overcome with different tracking solutions and new technologies.

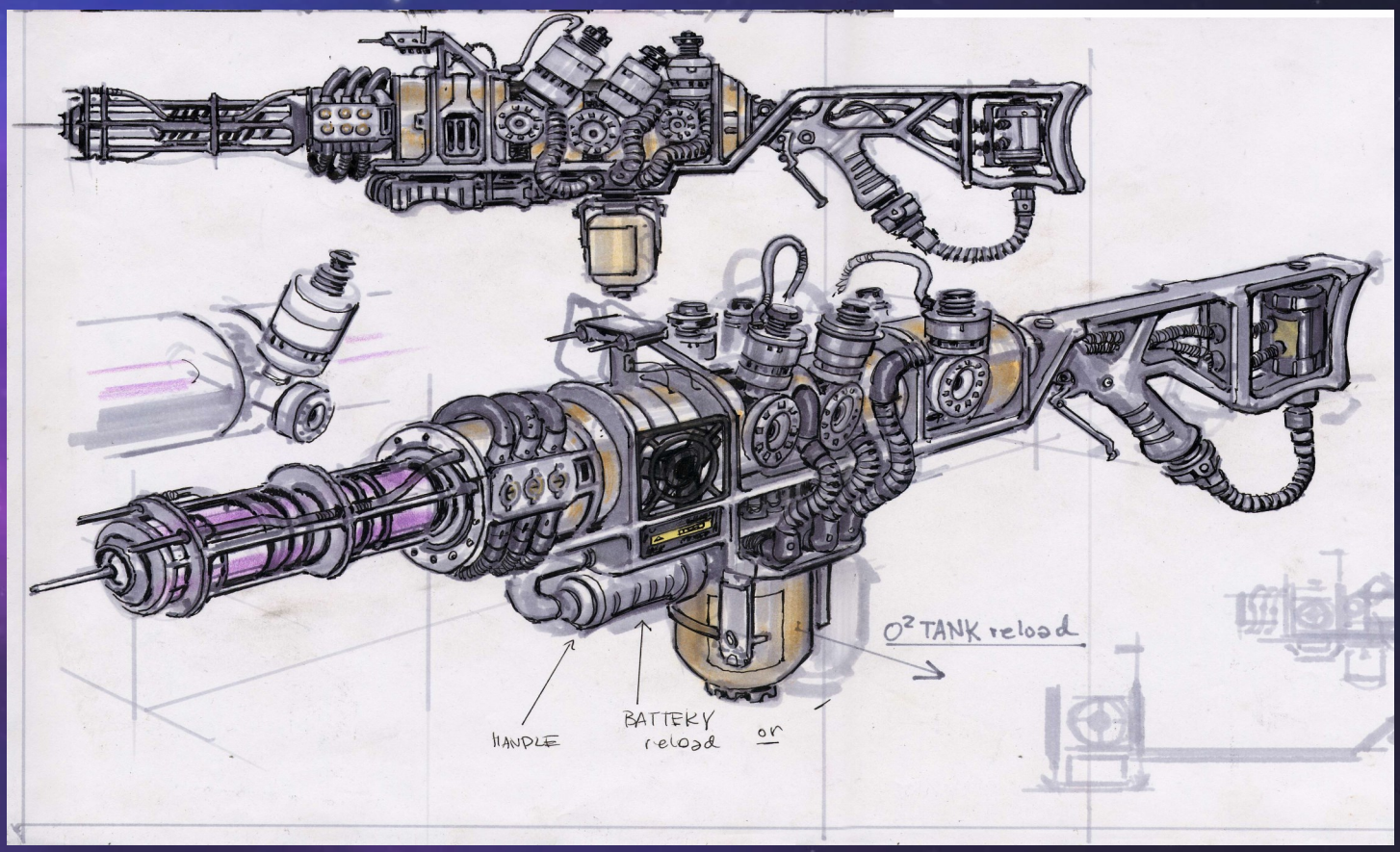
ENERGY WEAPONS

(Chiranjib Baruah, 2nd sem Mechanical)

From the earliest times, human beings have used projectile weapons as ranged weapons. From the arrow to bullet, the basic idea is projectiles. Energy weapons have been a long work of fiction in movies or comics and so on.

Laser is a very powerful energy weapon. It has been realised and is being used in military. Extremely powerful long ranged laser can be built by focusing more radiation. However extremely powerful lasers although are in existence, are too bulky to be actually made into a hand held weapon. But if we could use nanotechnology to minimize power sources for laser and the laser components, it could be a reality that soldiers are using laser weapons.

Plasma weapons are thought of as super weapons in fiction. And truly so because if you are able to deliver a charged plasma of about 800 deg. Celsius, the target sure is not going to live without losing a body part. But then to make it a reality several attempts are being made and many are



currently going on in various defence labs. But perhaps the conventional ideas can offer us a starting solution that might lay the foundation for the future weapons. Supposing we make an extremely strong magnetic confinement but of the size of a bullet and we store the plasma in the bullet which could be accelerated electromagnetically to an extremely high speed or we could just use the .65cal lapua cartridge but with the plasma bullet and fire, we would get extremely high speed and accuracy. If the bullet reaches the target and on reaching the target, if it

if it could release the plasma inside the body of the target, it could provide very good damage under the condition that the plasma does not lose heat because if we directly fire plasma, the heat would be lost at about 20cm. So the bullet also has to have a very good heat insulating surface as well. Such materials hopefully are available and hope it gets developed by the right hands.

FLYING AT THE ALL NEW LEVEL

SHUVAM DAS CHOUDHURY,
MECHANICAL ENGINEERING, 2ND SEM

On December 17, 1903 at 10:35 a.m., the Wright Brothers achieved their dream, their "Dream to fly". Now in this century, "flying" is an old concept and requires improvisation. So what can be done that will enable us to touch the sky right from our homes and save the valuable time spent on our journey to the airport and needless to say the time wasted amidst hefty traffic. We certainly cannot afford enough land to build and own personal runways in our backyard to fulfil our aforesaid desire. So do we have an alternative? Of course we do . . .

In the last century, technological advancement has made it possible to build airplanes and cars which have changed the way we live. Cars, which became affordable for the general population, have allowed us to move farther away from cities, and planes have cut travel time to faraway destinations considerably. Now what if in this century, we combine the technologies of aviation and automobiles and create a combo that will serve our purpose of flying from our homes? Sounds like a great idea, doesn't it?

In this article, we will take a look at some of the advancements in this area and examine some flying vehicles that we will be able to park in our garage in the next decade.

THE FIRST PERSON TO BUILD A FLYING CAR WAS GLENN CURTIS BUT HIS COULD ONLY HOP. WALDO WATERMAN ON MARCH 21, 1937 ACTUALLY BUILT A "FLYING CAR" THAT TOOK TO THE SKY. IT WAS COMMONLY CALLED FLIVVER AIRCRAFT.

Figure 1: Waterman's Flivver Aircraft

THE X-HAWK (A VAN-SIZED DRIVABLE VTOL AIRCRAFT DESIGNED FOR MILITARY AND SEARCH & RESCUE OPERATIONS) ALSO CALLED AIR MULE IS BUILT BY TACTICAL ROBOTICS LIMITED. THE AIR MULE UTILIZES INTERNAL LIFT ROTORS THAT ENABLE IT TO FLY INSIDE OBSTRUCTED (E.G. MOUNTAINOUS, WOODED, URBAN) TERRAIN WHERE HELICOPTERS ARE UNABLE TO OPERATE.

Figure 2: X-Hawk or Air Mule

Figure 3: Moller Skycar M400

SPEAKING OF FLYING CARS THAT WILL SUIT OUR DAY TO DAY PURPOSE WHICH IS PRESENTLY BEING SERVED BY MOTORCARS, I CANNOT MISS TO MENTION THE MOLLER SKYCAR M400, A PROTOTYPE PERSONAL VTOL (VERTICAL TAKE-OFF AND LANDING) AEROCAR INVENTED BY PAUL MOLLER, A CANADIAN ENGINEER. THE SKYCAR COMES IN SEVERAL VARIETIES PROVIDING MAXIMUM ON-ROAD 330 MILES/HR AND CRUISE SPEED OF 305 MILES/HR. SPEED OF IT IS POWERED BY 4 ROTAPOWER 500 WANKEL ROTARY ENGINES, 180 HP EACH.

COMING TO AN AEROCAR WHICH IS MORE DIRECTED TOWARDS PRACTICALITY IS THE TERRAFUGIA TF-X, A PLUG-IN HYBRID TILT-ROTOR VEHICLE THAT WOULD BE THE FIRST FULLY AUTONOMOUS FLYING CAR. IT HAS A RANGE OF 500 MILES PER FLIGHT AND BATTERIES ARE RECHARGEABLE BY THE ENGINE. WE CAN EXPECT TO SEE THE TF-X PLYING ON THE ROADS BY 2015.

Figure 4: TF-X while flying

Figure 5: TF-X on road

While advancement in science and engineering continues, we can expect more sophisticated aerocars hitting the road in coming decades.

WHAT DO THEY EAT IN SPACE ?

SUVANSHA NIGAM
INT M.TECH, 4th SEM
DEPT OF FET

IT'S AN OLD PROVERB, "WE ARE WHAT WE EAT". THIS IS NOT ONLY TRUE FOR EARTHLINGS ON THE EARTH BUT FOR THE ONES TRAVELLING IN THE OUTER SPACE.

John Glenn, the first American to orbit the earth is also the first one to eat in the outer space. Food packaging and eating was quite a challenge because of the weightlessness in the void. There was an uncertainty about the behaviour of the human body in such a condition. There were a series of experiments which had to be undertaken in order to establish infallible methods of food packaging, storage, preservation and eating.

JOHN GLENN

John Glenn had his food in space with the help of a tube which he inserted into the hole of his helmet and then to his mouth. As described by him although the eating experience was easy it was not very appetizing and palatable. The reason for this was lack of technological knowledge required to preserve the food and make it available in the form that it could be consumed in the cosmos.

The food to be taken on space shuttle is analysed through nutritional analysis, sensory evaluation, drying, rehydration and storage studies. Package studies are also performed.

I am going to throw some light upon some of the most fascinating space foods and the related developments that occurred .

► The aluminium tubes initially used were eventually replaced because of their weight and size. With time not only did the menu improve but their occurred improvement in the packaging of food also.

► The Apollo astronauts were the first ones to have hot water on flight. They were also the first ones to have spoon bowl containers which made eating easier.

► The whole eating experience in space ameliorated in Skylab since it was the first NASA space vehicle to have a dining area inside. It also had a freezer and refrigerator. Other developments seen by Skylab were collapsible bottles for drinking, aluminium cans having full panel pull out lids, and water valve for rehydration of canned foods.

WITH THE INCREASE IN KNOWLEDGE AND UNDERSTANDING, THERE HAS BEEN A WAY LOT OF IMPROVEMENT IN THE 'SPACE MENU'.

It's more of a normal food that is generally available in the market. Astronauts now even have the liberty to design their menu on their own. Even fork, knife etc. are being used. Meal trays provided have made eating a lot more convenient.

TECHNOLOGIES :

1. Technologies like THERMOSTABILISATION, drying and rehydration have played a major role in the boosting up of the aliment.

Process :

Thermostabilisation is a method of food preservation that uses high temperature and pressure to make food shelf stable. All the canned foods fall under this category. Intermediate moisture food is the food prepared by restricting the water activity in order to restrict microbial growth in the food. This kind of food do not need any preparation before eating . Dried peaches, pears, beef etc. are intermediate moisture foods.

2. *Rehydratable food* is an excellent method of reducing the weight of the space shuttle at the time of launch as the water is removed from the foods and they are preserved in the dried form.

The water can be added to the food prior eating from a nozzle provided in the pack. The food is then inserted in the mouth through a flat tube present in the package. The water on the space shuttle is generated by recycling the cabin air. Apart from processed food, food in their natural form is also eaten. They are packed in flexible pouches which can be cut open with scissors when required. The flexible

ASTRONAUT'S ICECRAM - A SPACE FOOD

CONCLUSION

Space foods have seen boosts with the growing understanding. With the advancements now it is possible to enjoy the food just like it is on the earth. Since the duration of the manned missions have increased with time, the need for feeding the men in space with a healthy and balanced diet has also increased. The food should also be appetizing and palatable at the same time. Thanks to Food Engineering and Technology.....this is no more a Herculean task now!!!

10 random facts

SHUBHAM SHARMA (ECE)
FAROOQ ANSARI (CSE)
B.TECH 2ND SEM.

Spam generates 33 billion kilowatt hours of energy every year enough to power 2.4 million homes producing 17 million tons of CO_2.

How big is the net?

"The mind seemed to grow giddy by looking so far into the abyss of time",said the 18th-century scientist John Playfair, recalling the moment he learned of the Earth's long history. If Playfair could peer into the depths of the internet he might get that giddy feeling again. In 2005, Google estimated the internet contained some 5 million terabytes of data - that's more than 1 gigabyte for each of Earth's 4.5 billion trips around the sun.

No one has received more U.S. patents than Thomas Edison – 1,093 to be exact.

The pressure that exists in the core of a neutron star is so dense and strong, scientists think it may be very similar to the condition of Bigbang.

Who controls the internet?

The official answer is no one, but it is a half-truth that few swallow. If all nations are equal online, the US is more equal than others.Communication over the internet occurs through innumerable servers and cables, most of which are in private hands. However, in terms of influence, the overwhelming balance of power
lies with the Internet Corporation for Assigned Names and Numbers, based in California. ICANN is a not-for-profit organisation that regulates online addresses, known as domain names, and their suffixes, such as ".com" and ".org". Since ICANN reports to the US government's Department of Commerce, the domain name process is effectively overseen by the US government.China, Russia and Europe have all expressed concern over this matter.

The first laser was made in California in 1960.

Sun Microsystems' Java software platform was originally designed for smart home appliances like microwave, washing machines and set-top boxes.

The Internet is the fastest-growing communications tool ever. It took radio broadcasters 38 years to reach an audience of 50 million, television 13 years,and the Internet just 4 years.

The first two video games copyrighted in the U.S. were Asteroids and Lunar Lander in 1980.

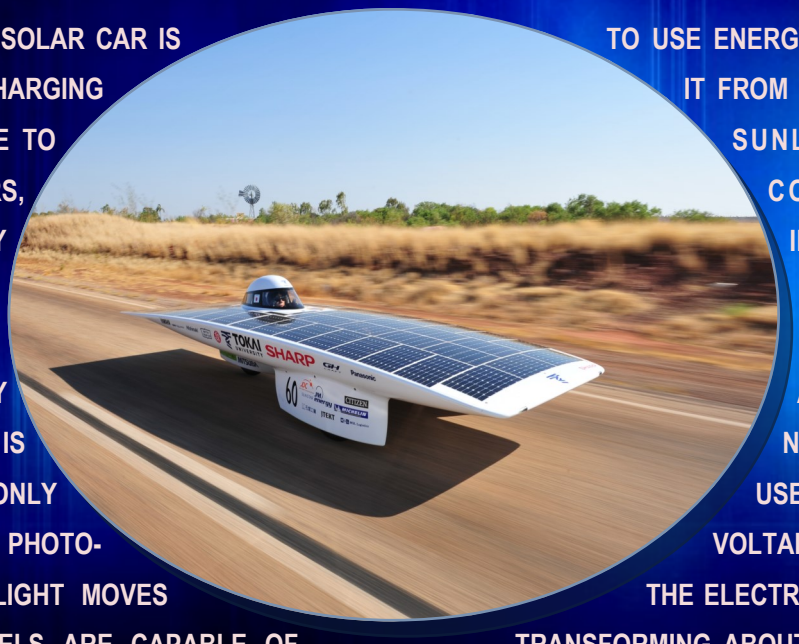
One google search produces about 0.2g of CO_2 but since we hardly get a single answer from one search, a typical search session produces about the same amount of CO_2 as is done in boiling a cattle.

POWER YOUR VEHICLE BY SOLAR ENERGY

SHUVANKAR DEY, MBA 2nd Sem

WHAT IS A SOLAR CAR?

A SOLAR CAR IS A LIGHTWEIGHT, LOW POWER VEHICLE, RUNS ON SOLAR CELLS WHICH CONVERT SUNLIGHT TO ELECTRICITY. PHOTOVOLTAIC OR SOLAR CELLS PRODUCE ELECTRICITY ONLY WHEN SUNLIGHT IS PRESENT. IN THE ABSENCE OF SUNLIGHT, A SOLAR- POWERED CAR DEPENDS ON ELECTRICITY STORED IN ITS BATTERIES. IT IS GENERALLY BUILT AS A RACING CAR.

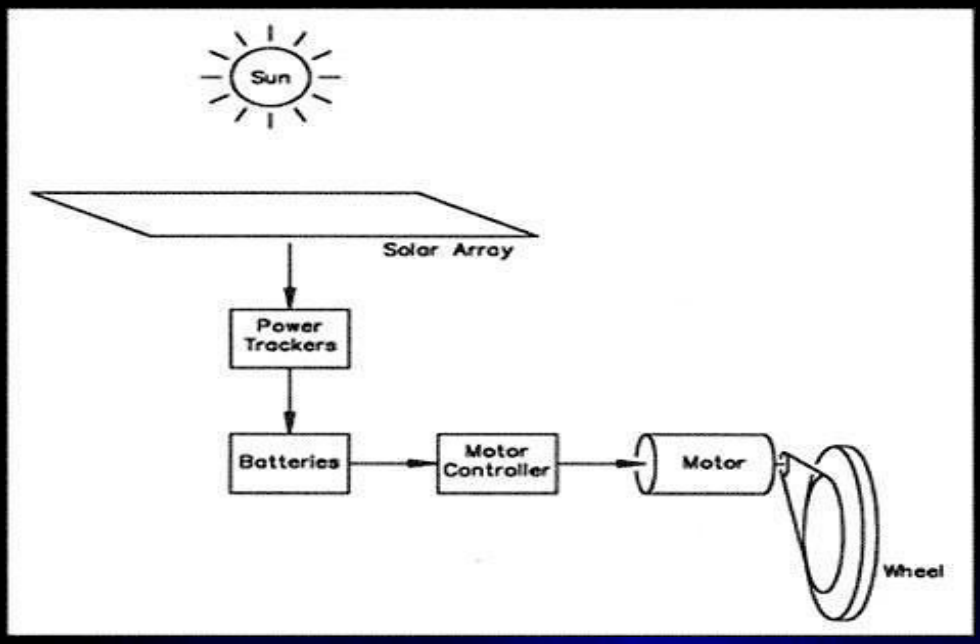


THE BASIC PRINCIPLE OF SOLAR CAR IS TO USE ENERGY THAT IS STORED IN A BATTERY AFTER CHARGING IT FROM A SOLAR PANEL. SINCE DIRECT EXPOSURE TO SUNLIGHT DOESN'T HELP MOVE THESE CARS, CONVERSION OF TRAPPED SOLAR ENERGY INTO USABLE POWER IS NEEDED. IN SOLAR CAR,SPECIALLY DESIGNED BATTERIES SERVE AS CONVERTERS. SOLAR ENERGY ALSO NEEDS TO BE STORED SINCE SUNLIGHT IS NOT ALWAYS AVAILABLE. THE MOST COMMONLY USED SOLAR COLLECTORS ARE SILICON BASED PHOTOVOLTAIC CELLS WHERE THE ACCUMULATED SUNLIGHT MOVES THE ELECTRONS AROUND. NEW MODELS OF SOLAR PANELS ARE CAPABLE OF TRANSFORMING ABOUT 22% OF ACCUMULATED SUNLIGHT INTO ELECTRICITY THAT SOLAR CARS USE. IT'S IMPORTANT TO NOTE THAT THOUSANDS OF PHOTOVOLTAIC CELLS ARE NEEDED TO TRANSFORM SUN ENERGY INTO ELECTRICITY NEEDED TO OPERATE A CAR.

PRINCIPLE:

ENERGY FROM SUN IS CAPTURED BY THE SOLAR PANELS AND CONVERTED TO ELECTRICAL ENERGY. THE ELECTRICAL ENERGY THUS FORMED IS FED TO THE BATTERIES WHICH GET CHARGED AND IS USED TO RUN 24 V DC HIGH SERIES MOTOR. THE SHAFT OF THE MOTOR IS CONNECTED TO THE REAR WHEEL OF THE VEHICLE THROUGH CHAIN SPROCKET. THE BATTERIES ARE INITIALLY FULLY CHARGED AND THEREAFTER THEY ARE

CHARGED BY PANELS. THIS HELPS IN COMPLETING THE CHARGING AND DISCHARGING CYCLE OF THE BATTERIES, WHICH IS VERY IMPORTANT FOR PROPER WORKING OF BATTERIES.



INDIAN SOLAR CAR : *ELECSHA*

ELECSHA IS ONE TYPE OF SOLAR CAR DEVELOPED BY BLUEBIRD ELECTRIC RACING LTD. PETROL AND DIESEL POWERED AUTORICHSHAWS ARE SOME OF THE MOST POLLUTING VEHICLES ON INDIAN ROADS. ELECSHA IS AN ELECTRIC AUTO RICKSHAW WHICH IS COMPLETELY SILENT AND NON- POLLUTING, BUILT AND TESTED.

IT IS CAPABLE OF TRAVELLING 60-70 KMS/CHARGE, CARRIES 2 PASSENGERS AT 35-49 KMS/HR AND USES 40% LESS CHARGE THAN PETROL & DIESEL POWERED VEHICLES

FUTURE OF SOLAR CARS :

SOLAR VEHICLES ARE BOUND TO BE THE FUTURE OF THE AUTOMOBILE INDUSTRY. SOLAR VEHICLES BEING NON-POLLUTING AND ECONOMICAL SEEM TO BE THE ONLY ANSWER TO THE INCREASING POLLUTION CAUSED BY AUTOMOBILES. SOLAR VEHICLES REQUIRE LESS MAINTENANCE AS COMPARED TO THE CONVENTIONAL AUTOMOTIVE AND ARE VERY USER FRIENDLY. THE EFFICIENCY OF SOLAR CELLS HAS BEEN STEADILY IMPROVING WITH TECHNOLOGICAL IMPROVEMENT FOR THE PAST 50 YEARS. THE PRODUCTION OF SOLAR ENERGY BY SOLAR CELLS DOES NOT CAUSE ANY HARM TO THE ENVIRONMENT. THE PEAK TIME FOR ELECTRICITY PRODUCTION IS DURING THE DAY AND USING SOLAR ENERGY IS A HIGHLY CONVENIENT OPTION.

WEARABLE TECHNOLOGY

ANIRUDDHA SINHA (ECE) &
UDIT ARUNAV (MECH.),
B.Tech 2nd Sem

THE WORLD HAS EVOLVED INTO A NEW ERA OF LIFESTYLE IN THE RECENT FEW YEARS. AS WE LOOK AROUND US, IT SEEMS AS IF TECHNOLOGY IS NOT A PART OF OUR LIVES, RATHER, WE ARE LIVING IN AN ENVIRONMENT OF TECHNOLOGY. IF WE SEE THE ADVANCEMENT IN TECHNOLOGY IN THE PAST FEW YEARS, IT'S EVIDENT THAT ONE WILL BE LED TO ASTONISHMENT. NONE WOULD HAVE EVER IMAGINED LIVING IN THE AMBIENCE OF SUCH LUXURY, WHERE NOTHING SEEMS TO BE A HERCULEAN TASK.

THE MOBILE WORLD CONTINUES TO EVOLVE AT INCREASED SPEEDS WHILE WE BECOME MORE DEPENDENT ON SMARTPHONES

IN OUR DAILY LIVES. IN FACT, IT'S NOW DIFFICULT TO IMAGINE LIFE BEFORE THE CELL PHONE. DUE TO THE AMAZING FURTHERANCE WE HAVE MADE OVER THE PAST DECADE, MANY HAVE REACHED SOME SORT OF PEAK. BUT FOLKS, THIS IS NOT THE END YET. THERE ARE VARIOUS EXCITING TRENDS WE HAVE STARTED SEEING NOW AND CERTAINLY WILL SEE IN THE NEXT FEW YEARS, ONE OF WHICH HAPPENS TO BE THE "WEARABLE TECHNOLOGY".

1. GOOGLE GLASS :

"WEARABLE TECHNOLOGY" IS JUST GETTING STARTED AND IT IS OF COURSE BEING LED BY NONE OTHER THAN GOOGLE WITH THEIR "PROJECT GLASS" OR THE "GOOGLE GLASS" AS MOST OF US KNOW IT. IT BRINGS RICH TEXT AND NOTIFICATIONS AS WELL AS OTHER INFORMATION STRAIGHT TO YOUR EYES. THE DEVICE ALSO HAS A 5 MP CAMERA AND RECORDS 720P. ITS VARIOUS FUNCTIONS ARE ACTIVATED VIA VOICE COMMAND. THE COMPANY ALSO LAUNCHED THE GOOGLE GLASS COMPANION APP, MY GLASS, THE DAY BEFORE THE OFFICIAL LAUNCH ON APRIL 15.

2. THE RING :

NEXT IN LINE IS THE **"RING"** – PRODUCT WHICH IS A COMBINATION OF GESTURE AND WEARABLE TECHNOLOGY. IT'S A DEVICE THAT YOU WEAR ON YOUR FINGER, THEREBY GIVING YOU THE POWER TO CONTROL ANYTHING YOU WANT FROM THE DEVICE. WITH FOUR KEY FEATURES, THE RING ENABLES YOU TO CONTROL YOUR HOME APPLIANCES THROUGH GESTURES, DRAW LETTERS IN THE AIR SO THAT THEY CAN BE RECOGNIZED AS TEXTS, RECEIVE ALERTS THROUGH VIBRATION AND LED LIGHTS, AND EVEN SET UP PAYMENTS FOR BILLS, ALL VIA A SINGLE GESTURE. BEING VERY FUTURISTIC, RING IS AN INCREDIBLY PRECISE DEVICE WITH SOME GREAT GESTURE AND LETTER RECOGNITION SMARTPHONE BASED SOFTWARE TO AID THE WAY. EACH APPLICATION HAS ITS OWN GESTURE THAT IS SIMPLY PERFORMED WITH ONE'S FINGER. SIMILARLY, THE DEVICE IS GREAT AT DETECTING LETTERS, EVEN WHEN DRAWN IN A JOINED UP MANNER. CUSTOM GESTURES CAN ALSO BE ARRANGED. COMPATIBLE WITH GOOGLE GLASS, AS WELL AS SMART WATCHES, RING HOOKS UP EASILY WITH OTHER DEVICES, ENSURING IT CAN BE THE MASTER OF YOUR DOMAIN. OUTSIDE, WHEN VISITING PARTICIPATING RETAIL STORES OR RESTAURANTS, IT'S EASY TO PAY THROUGH RING, BY SIMPLY TRACING THE NUMBERS OF A CARD OR BY GESTURING A CHECKMARK FOR A CHECKMARK PAYMENT. RING CHARGES UP VIA A MICRO USB CABLE, AND OFFERS AROUND 1000 CHARGES PER CHARGE, SO IT SHOULD BE A VERY HANDY TOOL, NO MATTER WHAT THE OCCASION.

3. USB NECKACE :

OF THE MANY OUT-OF-THE-ORDINARY FLASH DRIVES, THIS ONE GIVES OFF A POSITIVE, ALMOST CLASSY VIBE. PART OF A LINE OF CRYSTAL-STUDDED USB DRIVES, THIS **4GB USB NECKLACE BY SWAROVSKI** IS A PROOF THAT TECHNOLOGY CAN ALSO BE SOPHISTICATED AND ELEGANT AT THE SAME TIME.

4. USB CUFFLINKS :

SIMILAR TO THE USB NECKLACE, THESE **CUFFLINKS** GIVE A PROFESSIONAL LOOK TO AN ALREADY CLEAN AND FORMAL LOOK. EACH CUFFLINK CARRIES 2 GB WORTH OF STORAGE, AND IS ALSO AVAILABLE IN GOLD AND GUN METAL .

5. NIKE FUELBAND :

THE **NIKE+ FUELBAND** TRACKS OUR DAILY EXERCISE AND THE CALORIES BURNT WHILE DOING THOSE ACTIVITIES. FOR EVERY ACTIVITY, THE LED WILL LIGHT UP AND LET US KNOW OUR PROGRESS. WE CAN SET THESE GOALS, VIEW DETAILED PROGRESS, AND UN-LOCK ACHIEVEMENTS TO STAY MOTIVATED, OR SHARE IT WITH OUR SOCIAL NETWORKS VIA ITS IPHONE APP. IF ONE OF OUR NEW YEAR RESOLUTIONS IS TO MAINTAIN A HEALTHLY LIFESTYLE, A HEALTH MONITORING WRIST-BAND LIKE THIS CAN REALLY HELP.

6. BLUETOOTH GLOVES :

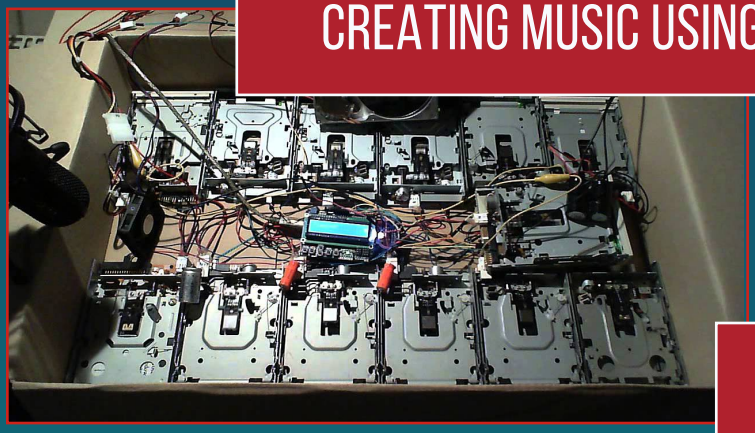
THE PROBLEM WITH WEARING GLOVES WHILE RIDING A SUPERBIKE OR SKIING IS THAT IT'S IMPOSSIBLE TO REACH FOR OUR SMARTPHONE WITH THE THICK OUTERWEAR. **BEARTEK** WAS A KICKSTARTER CAMPAIGN THAT HAD A GREAT IDEA: **A GLOVE THAT COMMUNICATES WITH OUR SMARTPHONE VIA BLUETOOTH**. IT HAS 6 TOUCH POINTS, THAT YOU CAN USE TO ANSWER PHONE CALLS, AND EVEN BASIC MUSIC CONTROLS.

ENGINEERING IN MOTION

POPULAR ENGINEERING VIDEOS FROM ALL AROUND THE WEB

FAROOQ ANSARI (CSE), SHUBHAM SHARMA (ECE)
BTECH 2ND SEM

CREATING MUSIC USING AN ARRAY OF FLOPPY DRIVES



IF YOU'VE GOT A BUNCH OF OLD FLOPPY DRIVES LYING AROUND, YOU ARE LUCKY. THIS GEEKY VIDEO SHOWS HOW A FEW HOBBYISTS CONNECTED AN ARRAY OF FLOPPY DRIVES WITH A MICROCONTROLLER TO CREATE A COOL RETRO JAM.

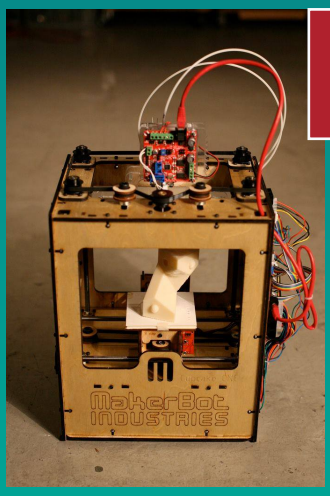
http://goo.gl/oPo4AZ

THE MAGIC OF MAKING CARS IN THE 1930s : CHEVROLET

THIS CHEVROLET MANUFACTURING REEL FROM 1936 IS NOTHING SHORT OF "INDUSTRIALIZED" MAGIC. IT'S FASCINATING TO SEE A ROOM FULL OF PISTONS BEING CHECKED BY HAND USING A WIDTH GAUGE AND MICROMETER.

http://goo.gl/oPo4AZ

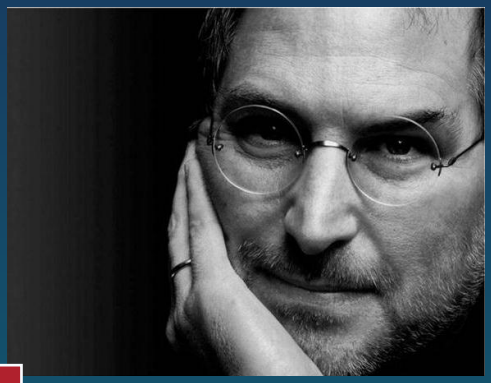
A PRIMER ON 3D PRINTING



A 3D PRINTER CAN "PRINT" IN PLASTIC, METAL, NYLON AND OVER A HUNDRED OTHER MATERIALS. IT CAN BE USED FOR MAKING NONSENSICAL LITTLE MODELS, YET IT CAN ALSO PRINT MANUFACTURING PROTOTYPES, END USER PRODUCTS, QUASI-LEGAL GUNS, AIRCRAFT ENGINE PARTS AND EVEN HUMAN ORGANS USING A PERSON'S OWN CELLS.

http://goo.gl/PsyWNc

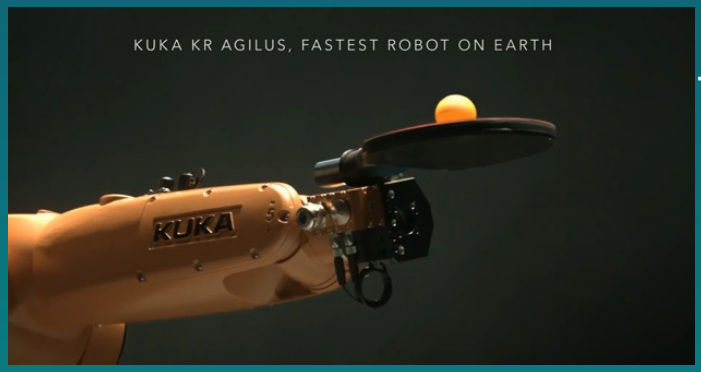
STAY HUNGRY; STAY FOOLISH



THIS IS STEVE JOB'S COMMENCEMENT ADDRESS AT STANFORD UNIVERSITY IN 2005. HE DESCRIBES ABOUT HIS "LIFE CHANGING" AND "CAREER TRANSFORMING" EXPERIENCES AND SHARES THREE INTERESTING STORIES OF HIS LIFE. THE STORIES ARE ABOUT CONNECTING THE DOTS, HIS LOVE AND HIS LOSSES.

http://goo.gl/b8oSCG

KUKA : FASTEST REFLEX ROBOT



WATCH THE BATTLE BETWEEN WORLD TABLE TENNIS CHAMPION TIMO BOLL AND THE WORLD'S FASTEST REACTING ROBOT, THE KUKA.

http://goo.gl/prK8SE

WEARABLE TEXT READER DEVICE

A FINGER-WORN DEVICE THAT ASSISTS THE IMPAIRED TO EFFECTIVELY READ PRINTED TEXT. IT INTRODUCES A NOVEL LOCAL SEQUENTIAL MANNER FOR SCANNING TEXT WHICH ENABLES READING SINGLE LINES, BLOCKS OF TEXT OR SKIMMING THE TEXT FOR IMPORTANT SECTIONS WHILE PROVIDING REAL-TIME AUDITORY AND TACTILE FEEDBACK.

http://goo.gl/CYbCSa

VINOD KHOSLA

EMMINENCE

> Look for people who critique you. Examine failure modes. Collect all the ways you might fail, and build contingency plans

Venture capitalist, Khosla Ventures

Co-founder, Sun Microsystems

Net worth: 1.4 Billion

Alma mater: **Indian Institute of Technology, Delhi**

Co-founder of the company that gave *Java* to the Silicon Valley, *Vinod khosla* was blessed with an innate entrepreneurial spirit. Born on 28 January, 1955 in an army officer's family, his father wanted him to join army. But by the age of sixteen he had already dreamt to make it big at the Silicon Valley (apparently Intel starting up at the same time boosted his imagination).

After he graduated from the *Indian Institute of Technology*, he encountered frustration in attempting to start an India-based company. *Vinod* at age 20, failed to start a soy milk company to service the many people in India who did not have refrigerators. But people don't say "failures are the pillars of success" for nothing, He instead came to the U.S. and got his master's in biomedical engineering at *Carnegie-Mellon University*. His start-up dreams attracted him to Silicon Valley, where he got an MBA at *Stanford University* in 1980.

When he graduated from *Stanford*, he sent out 400 job applications but only to small companies which started after 1976. Unfortunately (rather fortunately) he did not receive any job offers. He joined with *Stanford* business club partners in 1980 to start a computer-aided design software company named *Daisy Systems*, which was the first significant computer-aided design system for electrical engineers. The company went on to achieve significant revenue, profits. But Khosla was not satisfied, not yet. He was well aware of the commercial potential of the computers manufactured and he wanted to design the computer hardware on which the *Daisy* software needed to be built. He started the *Sun Microsystems* in 1982 to build workstations for software developers. At *Sun* he pioneered "open systems" and RISC processors. *Sun* was funded by longtime friend and board member John Doerr of Kleiner Perkins Caufield & Byers (KPCB).

EMMINENCE

Though *Khosla* rose from chairman to CEO with his abilities to pick "great teams and come up with winning ideas", his "forceful" micro managerial style supposedly led *Sun's* board to cast him out in 1984. *Sun's* $150 billion market capitalization in 2000 made it the largest Indian-founded corporation at that time.

After *Khosla* left *Sun*, he half-heartedly accepted an invitation from Doerr to join Kleiner Perkins Caufield & Byers. His lack of overwhelming investment success and mounting disheartenment at the laggard pace of innovation brought him to leave Silicon Valley. But Khosla's dream run was not over yet, in fact it had not even stated. He took on Intel's monopoly with *Nexgen* (the only microprocessor to have significant success against Intel, sold to Advanced Micro Design (AMD) for 28 percent of AMD).

Then came his 'blockbuster deal' in 1994, when he met six young men in their twenties who had created a new technology to search very large databases. Mr. *Khosla* told them they were on the wrong track altogether, that they should be thinking bigger. His suggestion was to adapt their search engine for the Internet. He then handed them a $5,000 check on trust and told them to buy a hard drive big enough to test his theory." When *Microsoft* bid $70 million for their company, then called Architext, *Khosla* persuaded the company's founders to refuse the offer. At Home Corp. bought out their company, now known as the Web portal *Excite*, for $6.7 billion in 1999. Following his initial outlay into Excite, Khosla's own ingenuity sparked another highly successful venture. His vision of encircling metropolitan areas with "rings of fiber-optic cables" to more efficiently transmits data led to the 1996 start of optical networking startup *Cerent*. Though *Cerent* had less than $50 million in revenues, their "microwave-sized box that could transfer 4 million phone calls per second from old copper telephone lines onto faster fiber-optic cables" brought Cisco Systems, Inc. to buy out *Cerent* for $8 billion. Khosla's $8 million investment for a 30% stake of *Cerent* returned $2.4 billion in three years.

In 2004, *Vinod*, driven by the need for flexibility and a desire to be more experimental, to fund sometimes imprudent "science experiments," and to take on both for-profit and for "social impact" ventures, formed *Khosla Ventures*, funded entirely with family funds. *Khosla Ventures* focuses on both information technology investments and clean technology ventures.

Aside from spearheading *Khosla Ventures*, one of Mr. *Khosla's* greatest passions is being a mentor to entrepreneurs, assisting entrepreneurs and helping them build technology based businesses. In addition, Mr. Khosla is a member of TiE, a not-for-profit global network of entrepreneurs and professionals founded in 1992 that now has more than forty chapters in nine countries. He is also a Founding Board member of the Indian School of Business. His current passion is Social Entrepreneurship with a special emphasis on Microfinance as a poverty alleviation tool. He is a supporter of many microfinance organizations in India and Africa. Mr. Khosla is also passionate about alternative energy, petroleum independence, and a pragmatic approach the environment

Beyond all this, *Vinod Khosla*, the venture capitalist is also a family man. He sees his family role as more important than his entrepreneurial role. Khosla "makes a point of having dinner with his family 25 times a month," and states that "I call my family my principal job and work my principal hobby, and I treat it that way. Family is priority one."

Internship EXPERIENCE

What is an *Internship*?

It is a structured opportunity for us to learn, grow, and contribute in a professional setting. As John Keats says, "Nothing ever becomes real until it is experienced", in similar terms internship has proved its worth in earning a graduate degree today. It gives us first-hand experience of the field while we are still studying.

Appended below are a few questions, answers to which are often sought by the students who are about to undergo Internship Programs.

HABIBA ULLAH

MBA 2nd Semester, Tezpur University,
B.E(IT), Gauhati University (2nd rank holder)

1)How did you apply?

I did my first internships as Summer Project (in 4th Semester) and Winter Project (in 5th Semester) during semester breaks. My faculty, the placement cell & seniors at college helped me choose the organizations. I also regularly checked the official websites of few organizations of my choice for internship-related notifications. Although at that time it wasn't a part of our curriculum, many of us willingly went for it as we expected it to broaden our knowledge horizon. Finally, after completion of my 6th Semester examinations, I had to undergo an Internship Program formally. I realized there that I could perform better than others due to my previous exposure.

2) Where did you get the inspiration from?

As part of our graduation learning process, our universities provide us with the opportunity of undergoing field training & we should make the utmost use of it. My faculty & seniors inspired me for the same. I had heard from external sources too, that these programs help us to deal with the practical scenario at our work place after we are employed. It also provides an extra weightage to our resume when we are appearing for job interviews, irrespective of on & off campus placements.

3) Where did you do your internship from?

As my branch was Information Technology, I got the opportunity to diversify my project experience in multiple fields related to Networking, Programming & Web-based Designing. The organizations were North East Frontier Railway, Indian Oil Corporation Ltd. & the Institute of Advanced Study in Science & Technology.

4) How was your experience?

My experience was great. I met many knowledgeable people who helped me learn new things & also to build up my communication skills whilst they were guiding me undergo my project.

5) What are the pre-requisites for an internship?

Basic knowledge is necessary, about the subject on which we are willing to pursue our internship project. We can gather that from our classroom lectures, textbooks, internet, etc.

6) Why is Internship important?

Internship is very important as it helps us to explore the benefits of its usability in practical life. It unleashes our potential & gives us a platform where we can prove our ability by applying our knowledge. Sometimes internship may also lead to PPOs (Pre Placement Offer) by that organization. It gives us a competitive edge in employment after our graduation & increases our professional confidence. It also helps one collect professional references.

7) How much have you improved after the internship programme?

Initially, I was a bit weak in coding. But as my project required hard-core programming & networking, I had to gear up my coding skills by going through various textbooks & doubt-clearing sessions with my faculty. E-learning sources also contributed in improvising my knowledge. So this experience made me technically sound.

8) Did you receive any sort of stipend? If yes, how much? Is it applicable for all?

No, I didn't receive any stipend. However, few of my classmates did get

as some organizations provide it on completion of the project. In my view, honing knowledge is more important than joining organizations just for the stipend they provide. Hence, choosing a good topic & organization & how we perform is all that counts.

9) When did you realize the importance of an internship project?

After completing my Engineering degree, I started to work as a formally employed engineer. I saw that I could easily adapt to the office environment there as I were already familiar with it. My reports & presentations, working skills etc. were appreciated by my seniors & colleagues. It was then that I realized that my internship project had actually benefitted me. Even if we directly go for Masters after our Bachelor degree, these internships give us a fruitful outcome.

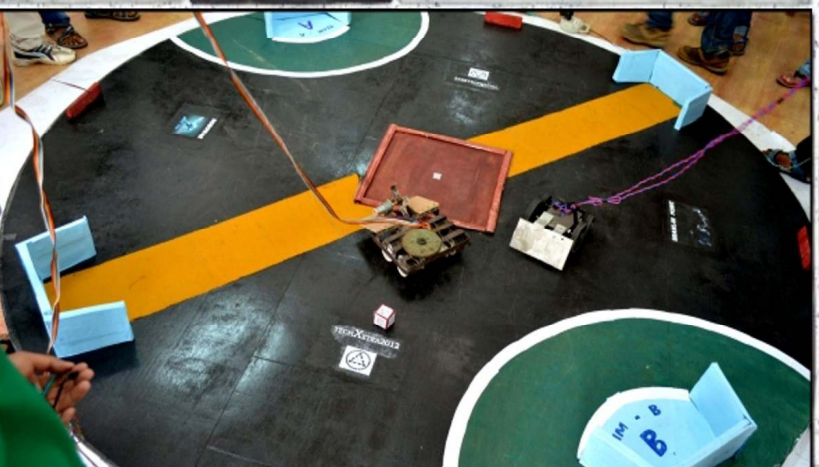
FEW LINES FOR THE READERS :

Decide about the topic for the Internship Project carefully. Don't hesitate to consult your guide, faculty & other knowledgeable persons while choosing the organization. Take help from them as & when required. The project report should be done in a systematic format in a disciplined manner. Maintain your regularity during the term. If you can give your best, the organization wouldn't hesitate to appraise your performance & will reward you accordingly.

TECHXETRA

METANOIA

WEBINARS



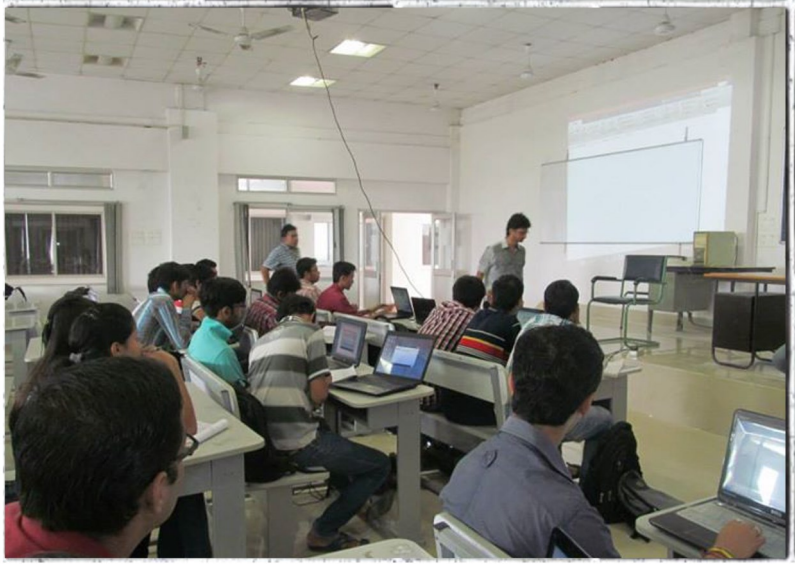
ROBO WARS

IEEE ACTIVITIES

STUDENTS ENJOYING THE CONCEPTS OF

MULTISIM

THE FIRST INTERACTION IN DEAN'S GALLERY

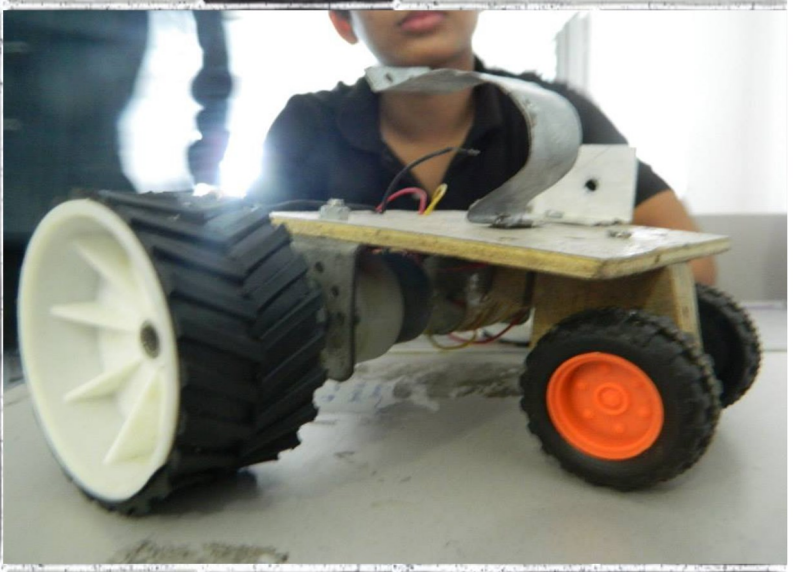


BEATING MATHS WITH

MATLAB

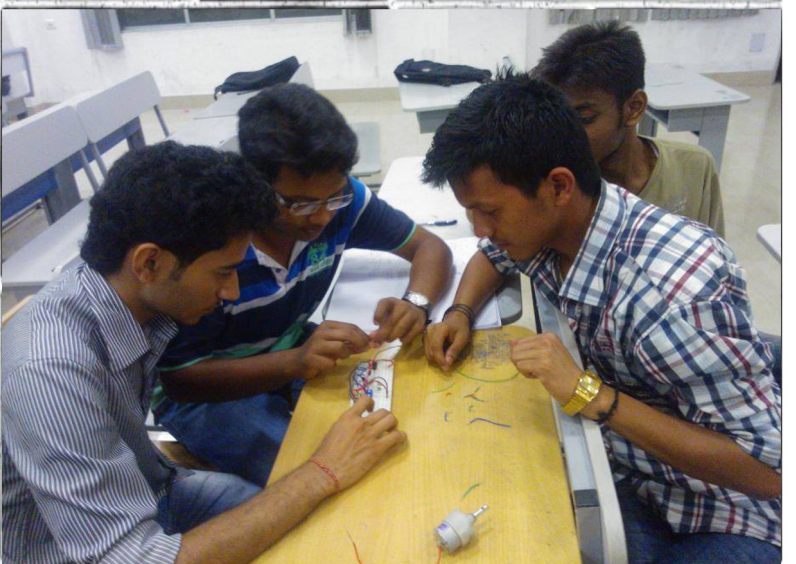
TURS ACTIVITIES

STUDENTS BUILD THEIR FIRST MANUAL ROBOTS



FIRST ROBOT - FIRST ACHIEVEMENT

GETTING HANDS ON LINE FOLLOWER ROBOT (NON-AUTONOMOUS)



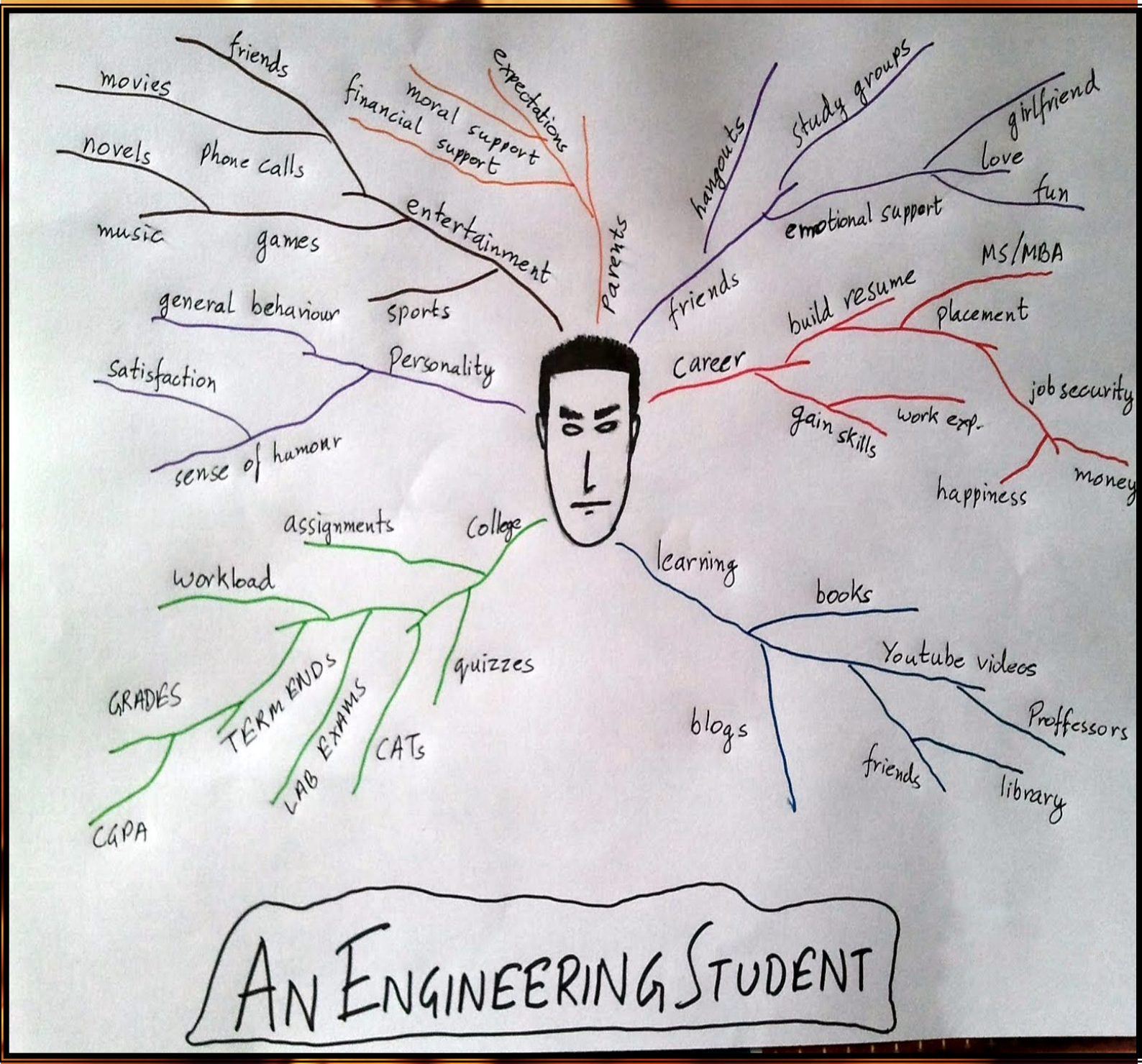
TEDx (FIRST TIME IN TU)

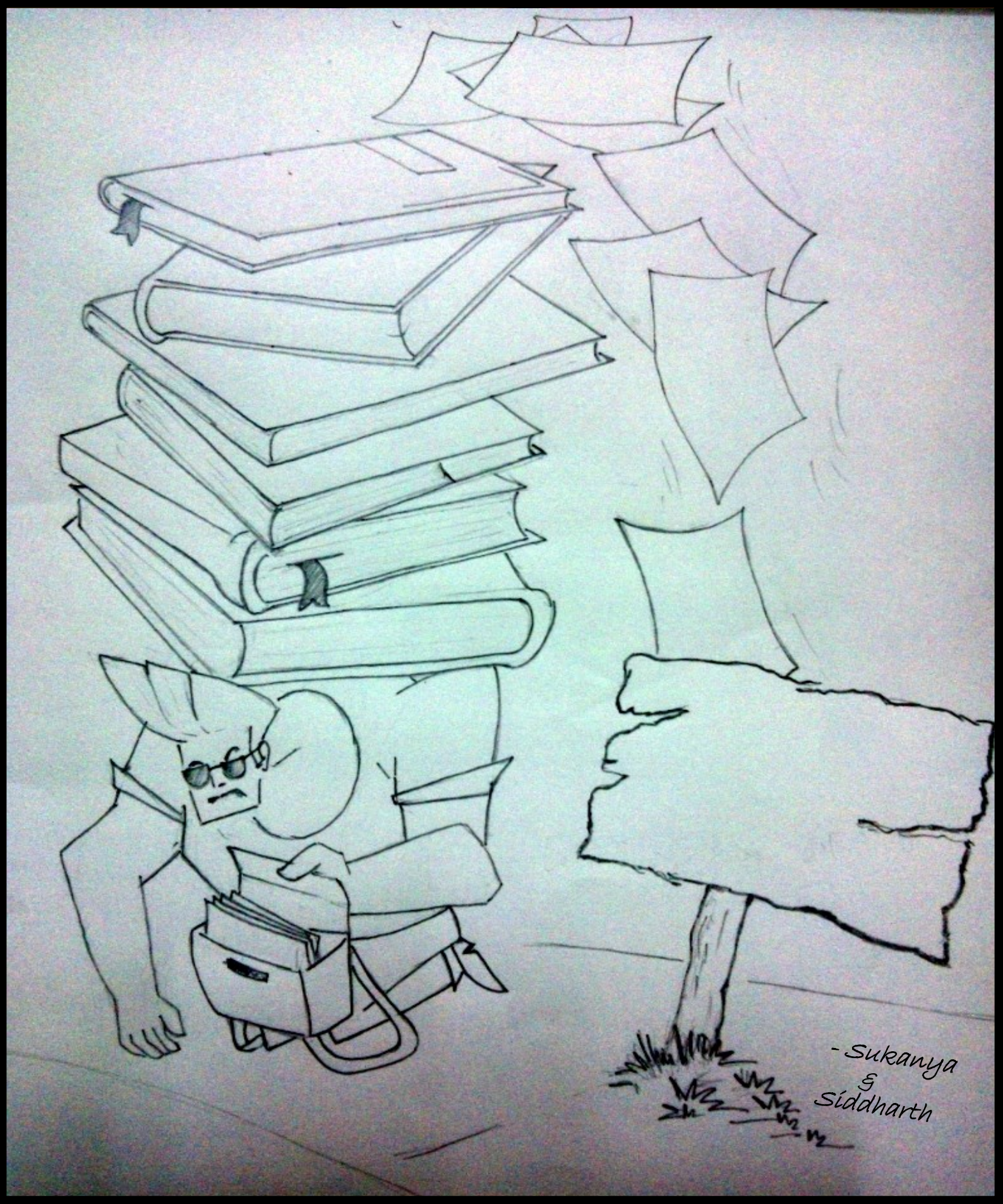
TU TEDx TEAM 1.0

THE TEDx SESSION

FUN ZONE

(SOME FACTS ABOUT ENGINEERS)




- Sukanya
&
Siddharth

CODE TO TEASE YOUR BRAIN

HERE ARE FEW CODING PROBLEMS FOR C ENTHUSIASTS.
SO, TEASE YOUR BRAINS WITH IT GUYS.
(Courtesy :IEEE TU)

1. Alan is a Network administrator. He has been charged with the duty of building a network consisting of a variable number of computers. Each computer must be given a unique ID to be identifiable in the network. The ID is transparent to the users of the network and must be generated automatically by Alan's program. The ID's are BINARY codes. Alan builds the software but it generates unique INTEGER codes. Alan gets married and goes off for his honeymoon. YOU ARE INCHARGE and the deadline is approaching. Build a program that converts the collection of integer ID's into Binary ID's.

Input to the program: The list of integer codes
Output of the program: The list of binary codes

2. A manager wants to keep track of the information of her employees in an organisation. The fields of the information are as follows: Name, Grade, Age
If Grade=HSK(Highly Skilled)
    Store Address and Credit card number.
If Grade=SSK(semi skilled)
    Store the Salary and distance from company.
You are the engineer she hires and you are out to impress! Develop a program that meets her requirements and climb up the professional ladder in the company. Use the concepts of structures and unions in your implementation.

3. What is the output of the following code

```
#include<stdio.h>
int main()
{
    enum days {MON=-1,TUE,WED=6,THUR,FRI,SAT};
    printf("%d %d %d %d %d %d",MON,TUE,WED,THUR,FRI,SAT);
    return 0;
}
```

4. What is the output of the following code

```
#include<stdio.h>
int main()
{
        union var
        {
                int a,b;
}

union var v;
v.a=10;
v.b=20;
printf("%d\n",v.a);
return 0;
}
```

5. Point out error(s) in the following code if any.

```
struct emp
{
        int ecode;
        struct emp e;
};
```

6. Write a program print "Hello World".....but there is a twist! You can't use semicolon anywhere in the program.

BONUS QUESTION: ATTEMPT IF YOU LIKE CHALLENGES! IT'S NOT COMPULSORY. NOT FOR THE LIGHT HEARTED!

Write a program to print "Hello World". The twist being! You cannot have a main function in your program.

HINT: Preprocessor directives!

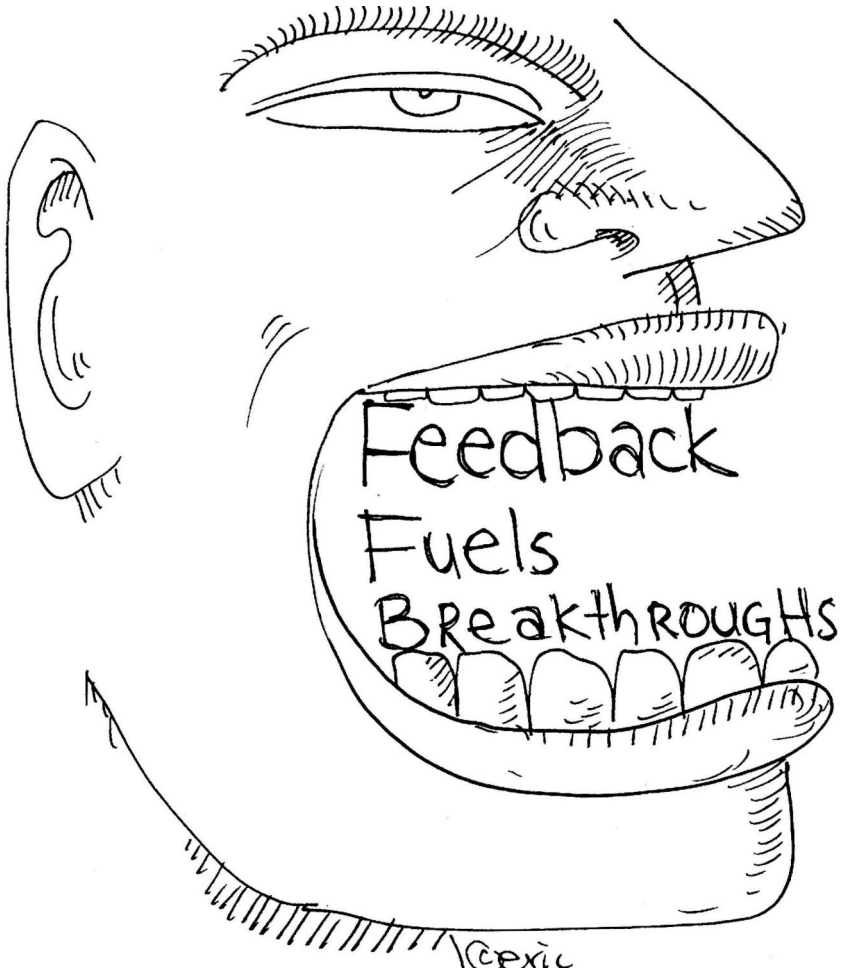
You may send your answers to the problems on the following email id:

tu.soe.mag@gmail.com

ANSWERS

TRIVIA CORNER

1. JAN KUAM, BRIAN ACTON
2. COMPUTERS
3. ASTERIX
4. MICROMAX
5. GOLF
6. IT IS MADE OF BOTH ANALOG AND DIGITAL SIGNAL ~ (1,0)
7. TENCENT (CHINA)
8. DONG NGUYEN (GEARS STUDIO)
9. GONITSORA
10. NETFLIX AWARD
11. AMAR BOSE (BOSE SOUNDS)
12. NEPTUNES TRIDENT
13. PROJECT GUTENBERG
14. DOLBY
15. THE INFINITY LOOP



AWAITING YOUR FEEDBACK !

Mail your suggestions and feedback to tu.soe.mag@gmail.com

SCRIPTURE