

INSEF ABSTRACT BOOK

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(The abstract text provided is exactly as submitted by the participants)

 **Innovation Partner of INSEF**

Project Code: BehvSc-01 (Team) Online ID:2174

Title: Creating Self Designed Mazes for autistic people to map their analytical skills

Name: Tanya Kaur Talwar & Akshat Gupta Std: 9

Guide: Sushrita Sachdeva

School: amity international school pushp vihar new delhi

ABSTRACT:

The methodology of solving a maze has always been clichéd, thus it stereotypes the way a person thinks and looks for solutions for any problem per say. However the emergence of a multilevel 3D maze will surely change rather enhance the way people think. In an effort to bring our project to practicality , it occurred to us that this design of ours of a maze is nothing but a game thoughtfully and self designed and could be strategically used to study the analytical abilities of mentally disabled and autistics persons The 3D game perfectly serves the purpose of entertainment and acute judging of potential of a person unlike intelligence tests that tend to overestimate disability in autistic people. We have created a miniature model of what we expect to turn out in the real world. This project is strongly contributing to the society by providing it with the best of human abilities. Further as advised we are working to create a virtual form of this game so that it can benefit more and more people including the ones not in the vicinity of this structure. We are In process of making an algorithm for the same and propose the future scope of the virtual game as well as the building. Since the project is being designed keeping in mind the aptitude of autistic persons we came up with an idea which reflects how a scientific principle would in effect route us back to the start when and if we took a wrong turn. The circuit diagram below shows how a light bulb will glow if the person with metallic shoes steps on the copper wire which will be placed on parts of the structure which are not included in the distinct and single route/solution.

Title: ARE YOU SELFIE(SH)?

Name: ANSHUMAN JHA & NANDINI BHARADWAJ

Std: 11

Guide: TANYA ANTHWAL

School: AMITY INTERNATIONAL SCHOOL, VASUNDHARA-6, GHAZIABAD

ABSTRACT:

Our project is focusing on students suffering from SELFITIS in the age group of 14-18 years. To tackle this we have created a MOBILE APPLICATION, which can detect the risk and monitor this psychological disorder. We are also using COGNITIVE BEHAVIORAL THERAPY to provide help to the students suffering from the same. The American Psychiatric Association (APA) has officially confirmed taking 'selfies' as a mental disorder. Selfitis is defined as the obsessive compulsive desire to take photos of one's self and post them on social media as a way to make up for the lack of self-esteem and to fill a gap in intimacy. The categories are-

BORDERLINE SELFITIS- taking photos of one's self at least three times a day but not posting them on social media.

ACUTE SELFITIS- taking photos of one's self at least three times a day and posting each of the photos on social media.

CHRONIC SELFITIS- Uncontrollable urge to take photos of one's self round the clock and posting the photos on social media more than six times a day.

The pilot sample for this research comprised of 60 students of the age group 14-18 years of a Private institution of Ghaziabad who answered an online questionnaire. The findings of the study revealed that out of a sample of 60 students, 22 were diagnosed with selfitis disorder. Belonging to three categories, Borderline (8), Acute (13) and Chronic (1).

Online questionnaire was used to identify students with disorders related to selfies. The questionnaire assessed the students on the following parameters - frequency, feelings and social acceptance. Once the students with SELFITIS were identified, they were exposed to Cognitive behavioral therapy and were provided with an application, which helped them monitor and keep a check on the frequency of selfies being taken per day.

Title: Aero Mosqui Gaurd

Name: SHWETA RANA & Than Dar Aung Std: 11

Guide: Sandhya Srivastava

School: Mamta modern Sr Sec school Vikas Puri New Delhi

ABSTRACT:

All of us think outdoor pollution is more polluted than indoor pollution but researches has shown that indoor air is 5 times more polluted than outdoor air. The reason for this are improper ventilation system. All the dust, VOC realse from phynyal and cleaning agents and smoke and CO are produced from cooking burning coil and incense sticks are unable to go out Due to this all the pollutants remain in our house and effect our heath. The air purifier we use are very expensive and emit ozone to kill bacteria which is very harmful for us also they are unable to remove odors. So we have designed an 100% workable air purifier by using some daily principles and it is very cost effective we have designed three layers through which the air will get purified. And it has a pathogen killing chamber that will deal with all viruses and bacteria also <http://sciencesociety.in/insef/openconf.php> mosqui gaurd has a mosquito killer that kills mosquito without harming us as now a days immuned mosquitos are not affected by sprays and all-out which don't affect them rather causes respiratory problems to us.

Title: Carecino: A machine learning based light band to classify and treat skin cancer using non-invasive photodynamic therapy

Name: Gursimran Singh Std: 12

Guide: Sangeeta Malhotra

School: Amity International School, Sector-46, Gurgaon

ABSTRACT:

More than 0.4% of the world population suffers from skin cancer today. Conventional skin cancer treatment methods are bulkier and lengthier which limits the productivity of such a huge number. Carecino is a smart band that can revamp the whole treatment process. It is portable like a normal band-aid, it is more reliable and it speeds up the process. It uses a stitch of Machine Learning with Photodynamic Therapy, which is a US FDA approved path for treating cancer cells.

The band linearly places three essential components: a light strip, an EMG electrode, and a camera. The strip is protected under an absorptive sheet. The process has been divided into 3 levels: Diagnosis-Classification, Factor Extraction, and Band Activation. Diagnosis and Classification are machine learning based methods which use a Convolutional Neural Network which feeds on ISIC Image Archive to diagnose and classify skin cancer lesions based on definitive morphological features. Factor Extraction involves using classified lesions to determine certain photodynamic factors such as suitable wavelength, suitable photosensitizing agent and drug-to-light duration. These factors are processed by an Intel Edison platform which finally activates the Carecino band. The EMG electrode monitors muscle movement and the camera logs the image-based improvement chart. The band follows all the guidelines issued by the American Cancer Society.

Therefore, Carecino is the first-of-its-kind budget friendly wearable cancer treatment technology that integrates computer science with health. With the band, people can most effectively treat skin cancer while doing their everyday tasks and optimize their productivity as well.

Project Code: Bio-02 (Jr) Online ID:2219

Title: Calcium Of Egg shell to enhance Nutritional value of food

Name: SOMANSH DHILLAN Std: 8

Guide: SUGANDHA DHILLAN

School: AMITY INTERNATIONAL SCHOOL, SEC 6, VASUNDHARA

ABSTRACT:

Eggshells are made of 94% calcium which can be powdered and added to food to increase its nutritional value. It can act as a digestible calcium supplements for humans, birds and animals. It has been estimated that each teaspoon of powdered eggshell contains 800mg of calcium and minerals too. Studies have revealed that calcium from egg shell powder is highly effective in reducing arthritis and PMS symptoms. Our objective is to develop a simple way to process egg shell powder to be used as a functional food ingredient. The process entailed washing, sterilizing, drying, grinding and sifting egg shells to create an egg shell powder.

METHODOLOGY

STERILISING EGG SHELL-

1. After removing egg white and egg yolk the shells of egg were washed for 5 mins under running water.
2. They were heated in distilled water for 10 mins and air dried

Two batches –

- Batch I was heated for 60°C (140°F) for 12 mins
- Batch II was heated at at 75°C (167°F) for 10 mins

3. Egg shells were powdered in a grinder

TO CHECK FOR SALMONELLA

1. Both batches were autoclaved
2. Five different concentration were made
3. Each concentration was inoculated in NA and PDA and incubated at 37 degree celsius for 48 hrs

OBSERVATION AND CONCLUSION-

Batch II showed no growth, proving that Batch II sterilisation was successful.

This innovation will turn a waste product into a value-added revenue source that is beneficial for health and nutrition. Future work includes enhancing nutritional value and sensory attributes.

Project Code: CompSc-01 (Team)

Online ID:2170

Title: A LOW COST ALERT BASED MECHANISM FOR GAS LEAKAGE FOR SOCIAL WELFARE

Name: Mimansa Porwal & Divyansh Kala Std: 12

Guide: Radha Kumari

School: Amity International School, Pushp Vihar, New Delhi

ABSTRACT:

A severe leak can reduce the amount of available oxygen resulting in dizziness, fatigue, nausea and headache.

Gas leak in homes can be caused due to various factors like faulty appliances, piping can become faulty and either loses its seal or simply breaks off because of long-term wear and due to poor ventilation.

Our device is a cost effective product that can reduce the casualties that happen every year due to gas leakage. It will raise an alert as soon as the gas level is above normal using various modules.

It works using an Arduino microcontroller and an MQ6 gas sensor.

The moment the sensor senses LPG level above the normal range, it will send an alert to the given phone numbers using a GSM Module.

Title: Autonomous Traffic Signal

Name: Paluk Gupta & Samiksha Ramesh Std: 10

Guide: Priyanka Thareja

School: Amity International School, Mayur Vihar, East Delh

ABSTRACT:

Objective:

Our project aims at reducing traffic congestion and the problems that follow through our proposed system which is able to prioritize between lanes by sensing densities of traffic using an AT89S52 microcontroller and IR sensors. It also balances the timer of the roads to ensure smooth flow of traffic on all sides.

It is autonomous in the sense that it is able to take decisions during various diversions.

Methodology

We searched for object detection technologies and chose IR technology and AT89S52 microcontroller to detect the vehicle density and built a model to check whether the system would work and got positive results.

We programmed it to prioritize between roads depending upon the traffic density by balancing out the total time of all roads (default time* no. of roads) and to disregard traffic on the blocked roads as null and prioritize between rest of the roads, thus managing traffic very efficiently.

Observations and Results

1. These signals are able to reduce time spent in traffic congestions to 33.33% and fuel consumption to 1/3.
2. The signals are able to prioritize between the roads with varying densities.
3. The system is autonomous by acknowledging traffic at blocked roads and peak hours.

Title: Robotic hand and leg for amputees

Name: Aniruddha Varma & Rachit sehrawat Std: 7

Guide: Rashmi Sehrawat

School: Amity International School,PushpVihar,New Delhi

ABSTRACT:

Robotic hands and legs for

Amputees

Generally robotic hands and leg cost 20,000\$ to 100,000\$. We have managed to make the same hand, leg for nearly 1000 times less

The problem

Many amputees (people with no hand or legs) feels lonely they are not able to live there life as a normal two handed , two legged person would we have tried to make a robotic hand , leg for the amputees at an incredibly low price

Materials

It is based on Arduino Uno it is made from foam a material easily available at home. We have also used servo motors for movement of fingers and bread board for circuitry

Future plan

We plan to make more prosthetics and make a 3d printed version of these models . we also plan to make a humanoid that will help people with depression and use it in the management

Project Code: CompSc-04 (Team) (Jr) Online ID:2163

Title: The smart eyeless device

Name: jyotin Goel & Shashwat Singh Std: 8

Guide: NEHA SAXENA

School: Amity International School,Noida Sector-44

ABSTRACT:

Blind people go through various problems in their daily life . We have tried to help them by making a stick. The stick consists of an arduino, buzzer, Ultrasonic range sensor, vibrating motor and a stick. We have programmed it such that if there is any object in the range of 90cm then the stick will beep and if there is any object in the range of 30cm it would vibrate. We have also added a GSM module which is attached to a small push button. When the blind person needs help, he can press the button. A SOS message would be sent to his family.

Title: MICRO FARM GROW YOUR OWN FOOD

Name: DHAIRYA KAPOOR & Saarthak Sharma Std: 8th std

Guide: NEHA SAXENA

School: amity international school noida sector 44

ABSTRACT:

Micro Farm: Grow Your Own Food

As we know the food requirement is more than the production rate. With farms/farming getting scarce and population migrating towards cities, we thought of need of a solution to the problem of growing food within a city home where soil, space and heights are constrained. We have come up with a microcontroller based hydroponic system which can be used to cultivate plants, leafy vegetables and fruits.

The solution is a compact design with affordable cost and easy installation and less power requirements. It uses the base as hydroponic and the flow of liquid fertilizer is controlled by live motoring and time delay. The micro controller is controlled by an opensource programming language (arduino programming). Most of the components are used daily in our life.

Working: The system uses Arduino Uno R3 as brain and signal/data cable is used as sensor wire and 12v led strip warm white is used as a light source. The liquid fertilizer solution (pH balanced) is taken from reservoir and the pre filter to remove any impurities. The motor lifts the water and via pre filter circulates it to neck cups containing the plants. The air pump is used to oxidize the liquid content to prevent the growth of unwanted microbes, algae etc. (Based on hydroponic principles). Motor's running time is controlled by the program and can be manipulated as per need. Presently it is set at 5s. LED light provides necessary environment for photosynthesis simulating sunlight which is not abundant in flats. It is not very intense to avoid algae growth but provides enough for plant food manufacturing. Buzzers are installed to indicate water level is within prescribed limit and LEDs indicate water level in container.

What's next?

The next level is to make it work on solar power/backup. Solar power would make it viable to replicate it on large scale. We would like to practically keep growing plants and make the system vertical to be feasible for flat/apartment wall usage.

Project Code: Energy-01 Online ID:2171

Title: SREG (Super Roller Electricity generator)

Name: Harsh Mali Std: 11th

Guide: varsha mali

School: demonstration multipurpose school , bhopal

ABSTRACT:

The concept of this project is that there are two mechanism one is attached to train a rubber plate and another is a electric generator with rubber surface which is attached to train track . So whenever train running on tracks the rubber plate which is attached to train came into contact of generator and it rotates the generator which produce electricity. At first i place a rack in place of rubber plate and pinion in the place of generator. which i think is fails due to friction but in this case the friction is less and very less chance of accidents. and as we all know there are about 7200 something platforms in india which consumes most the energy so this concept is useful for the stations. as the energy which is produced is consumed by the station if the quantities of motors are more over then we also supplies this energy to the local houses which are near to the stations or the tracks. so next thing comes into our mind how much electricity is generated by it. So as for this i ask it from my teachers and result is obtained is that the distance between the track gauge is 5.6 feet and we attached a generator of 10 hp which generator a lots of power and the power which is generated is almost 4 times greater then a wind mill and by further modifications of motor it is increased.

Project Code: Energy-02 (Team)

Online ID:2202

Title: Parabolic Dish Reflector

Name: Siddhant Jain & Parv Pratap Singh Std: 10

Guide: Anshu Khanna

School: Amity International School Vasundhara Sector-6

ABSTRACT:

The objective of this project was to utilise the solar power which is abundant and free of cost for energy generation by mounting a parabolic solar dish concentrator on top of high rise buildings.

We started working on this project by using a sterling engine at the focus of the dish but after being guided by scientist at the National Science Centre, we replaced the sterling engine with peltier module. A peltier plate works on Seebach effect in which difference between two dissimilar electrical semiconductors produces a voltage difference between the two substances. Peltier module can run on the heat generated by the sun and on the other side heat sink or chilled water can be used for heat dissipation. By heating one side and cooling the other, a temperature difference is created which plays an important role in voltage generation. Generated voltages can be high or low depending on the needs of the user and the number of connected peltier modules but it can be controlled and stabilised. We have made a prototype by using a small TATA SKY dish. We first covered it with aluminium foil and noted the observations but they were quite low. Then we replaced the foil with small-sized mirrors and tried boil water which was done in very less time.

Energy from parabolic solar dish which is more effective than solar panels, requires less space, efficiency is 12 times more, is less expensive, can lower the electricity bills by 30 to 50%. One dish of 12 feet diameter can produce nearly 25kW of energy which can fulfill the basic requirements of a tower in a society.

Title: Safety Barrier

Name: Vardaan & Pratham Kaushik Std: 9

Guide: Mrs. Anshu Khanna

School: Amity International School sector - 6 Vasundhara

ABSTRACT:

Abstract

The project which we have chosen relates to the safety of the people who are moving on the roads either on foot or on bike, a car, a school bus, a truck. Me and my friend both of us come together in the same school bus and we have to cross 3 – 4 red lights. Since in the morning all school buses are on road, people are rushing to their place of work in their car, buses, motor cycles etc. Even though there are traffic lights, no body waits at the red light and try to cross the lights if there is no traffic police there, which results in immense chaos at the red lights and many times our bus reaches school late.

So, we thought of making this project “safety barrier” which we think up to some extent will help regulating the traffic system at the red lights. It is type of barrier like we have seen at railway crossing. As soon as the light will turn red the barrier will fall down and it will be installed before the zebra crossing, so that the pedestrians could cross the road easily, and as soon as the light will turn green the barrier will be lifted up automatically.

We had done the survey at the four red lights which came in our way to the school and asked about the number of file for red light jumping in the last two months from the traffic police and we found out the following data :-

1. Dabur Chauraha -60 per day
2. Country inn - 40 per day
3. Vasundhara veg/fruit market - 30 per day

4. Vasundhara /industrial area - 20 per day

We also talked to the commissioner of the traffic police regarding the project. He appreciated our idea and encouraged us to work on this project.

We have made the prototype of the project. Photos of project are shown below

Project Code: Engg-01 (Team) Online ID:2158

Title: Autonomous Robot For visually Impaired

Name: Utkarsh Jain & Karish Grover Std: 11

Guide: Ms. Radha kumari

School: Amity International School, Pushp Vihar, New Delhi

ABSTRACT:

How do visually imapaired and dependents cross the road ?

A robot has been designed with an automatic set value feeder for 2 variables with continuous auto-calibration.

In other words, the robot had been made such that it could operate in any environment, under changing lighting conditions ie, Day or Night.

It works as follows

Two robots will be placed on opposite sides of a red light.

Only one round would be done in one Redlight.

While working the robots will avoid if any car happens to come close at an alarming rate .

It would go till the end of footpath and then turn 180°

Title: Smart water saving Toilet

Name: AYUSH SINGHAL Std: 11

Guide: DR.SATENDRA KUMAR SINGHAL

School: AMITY INTERNATIONAL SCHOOL , MAYUR VIHAR ,DELHI

ABSTRACT:

Smart Environment Friendly Toilet

Introduction:

Our project is based on a smart toilet system with the main objective of saving water which is often wasted away while using it. We have designed a system that will save water by reusing it in places wherever possible.

Purpose:

The main objective of our project is to save water which is wasted during the use of toilet (especially flush).As seen in many reports, majority of household water is used in toilets in which most of it goes waste. So in our project we have tried to design a system that will minimize water usage and also help in purification of used water. Also, this treated water will be used for other household purposes.

This would help in combating the water crisis that the world is facing right now.

Project Code: Env-02 (Team) Online ID:2207

Title: SUSTAINABLE SANITARY NAPKINS..... AFFORDABLE & BIODEGRADABLE

Name: KRISHI BHAT & Chhavi Sharma Std: 9th

Guide: Mrs Poonam Bhatt

School: Amity International school sec-6 Vasundhara

ABSTRACT:

SUSTAINABLE SANITARY NAPKINS..... AFFORDABLE BIODEGRADABLE

Menstruation is an experience that transcends culture class & caste. Most girls in the poor communities of the developing world already use cloth to deal with their menstruation. Sometimes they use things like leaves & mattress stuffing or cloth found in the household seldom to be either absorbent or quick drying. About half of the girls we interviewed knew very little about menstruation hygiene & health.

The present research project aims at providing menstrual hygiene education & eco/herbal washable clothpads to adolescent girls in India through herbal Pad programme

Disposable pads in market have arguably been regarded as a health threat to the users. They have been manufactured through chemical processes such as chlorine bleaching which releases dioxin as a by product.

Further the additives such as fragrances, deodorants, absorbency agents & wet-strength agents like polysorbate & urea formaldehyde can also cause allergies & skin reactions.

To make cheap & ecofriendly pad available at a sustainable low cost, safe, absorbent & degradable quality sanitary pads for the female fraternity is necessary. This can be realized by designing, developing & producing sanitary pads using locally available materials from banana & Cassia plant which have the antibacterial, antifungal & antistatic quality. Besides it contains a natural & unique agent which is a shield against pathogens. Besides, the raw material has highly Comfortable Silky Feel, have a cooler feel & also prevents stickiness in warm conditions. It absorbs & wicks water 3-4 times better than cotton & reduces body odour

The textile material, specially the sanitary napkin cloth, is treated with Cassia fistula extract for anti microbial quality & stuffed with the Aloe vera gel extracted which is herbal, ecofriendly, non irritant & very effective against the growth of micro-organisms. The prototype, developed was a regular type tab

less sanitary napkin of 15 ± 2 mm thickness, 200 ± 20 mm length & 65 to 75 mm width

We tested this pad in ten girls of our class & they feel good & comfortable.

Our pad helps to preserve the environment by significantly reducing the pollution they could produce. The easy & sustainable manufacturing steps put the cost of napkin around Rs 3 to 4 whereas the good quality napkins in the market (Whisper & Stay Free) range between Rs 6 to 10. Such a social friendly step will inculcate the sense of cleanliness & sanitation among the citizens of India. A small effort of ours makes a big difference.

Title: Algae on Urban Walls

Name: Maanya Lalchandani & Gauri Dwivedi Std: 10

Guide: Ekta Soni

School: Amity International School, Sector-6, Vasundhara

ABSTRACT:

In order to monitor environment pollution, long term solutions like afforestation and change in industrial norms aren't radical.

To meet this challenge we have developed algal glass panels which will utilize architectural surfaces as clever photosynthetic machines. The panels are filled with aquatic alga-chlorella, which is robust in nature and also has antibacterial properties. These algal glass panels will not only reduce the use of air conditioners and protect environment but also at the same time enrich the air inside the enclosed urban households with oxygen.

The prototype is a double layer glass façade containing chlorella algae and can be fixed on the outer surface of the window pane. A photo sensor has been installed to enable the panel to rotate as per the sun's movement during the day to ensure maximum utility of the glass panels.

We plan to provide a perfect environment for algae to grow providing an optimized light exposure, an efficient natural aerating system and CO₂ feeding, and an efficient agitating system that avoids the formation of algae deposit.

A model room was constructed to experimentally determine temperature, relative humidity and oxygen levels. Control readings were taken when installed glass panel wasn't filled with alga and when it was filled with chlorella alga.

This cost-effective algae bio skin will provide shade, reduce carbon footprint, produce oxygen and promote passive cooling attaining fourfold benefit for an urban household or commercial building, and responding to the current state of global warming. In fact, it will render the building completely carbon neutral. This device will not only counter the greenhouse emissions but also help in creating algal biomass which can be utilized to create an alternate energy source to handle the global issue of energy crisis.

Project Code: Env-04 (Team) Online ID:2167

Title: MANGOLASTIC : A Bioplastic

Name: ASHWATH SANJAY CHADHA & VASVI YAKSH Std: 10

Guide: SANDEEP KUMAR

School: AMITY INTERNATIONAL SCHOOL , SAKET , NEW DELHI

ABSTRACT:

In this project, our aim was to develop a method for using mango seeds in the production of bioplastic as a replacement for the traditional petroleum based plastic. Over the period of time, we were able to design a method and produce non-decaying plastic using mango seeds which can be molded into a making cosmetic prosthetics or used in the electrical insulation of cables. Mango seeds are a waste material rich of starch-according to Songklanakar in Journal of Science and Technology. Approximately 40–60% waste is generated during processing of mango, out of which peel and kernel constitute 12–15% and 15–20%, respectively. Mango kernel, on a dry basis, contains 65% starch, 2.9% reducing sugars, 5.7% proteins, 0.8% pectin, 9.3% fat and 1.1% tannins and rest is moisture.

Title: NEW BIO-PESTICIDE FORMULATION: ITS ACTION, APPLICATION AND EFFICACY

Name: KHUSHI SONI & AASTHA SHARMA Std: 8

Guide: EKTA SONI

School: AMITY INTERNATIONAL SCHOOL, VASUNDHARA-6, GZB

ABSTRACT:

Chemical pesticides have proven to be causing diseases in crops leading to health

problems in humans along with adverse effect on the environment. As a solution, bio

pesticides were introduced as certain plants possess biocidal activity which can effectively control numerous plant pathogens. In the present study, antimicrobial

activity of formulation prepared from botanical extract of tender core of Aegle

Marmelos leaves and Tagetes Erecta flowers is tested against pathogens P. Syringae

and D. Graminea diseased tomato and barley plants, respectively. In- vitro studies

were carried out to check the effectiveness of biocide formulation and its different

dilutions on pathogens. A comparative study is done to compare the effectiveness of

biocide formulation, fungicidal and anti-biotic drugs and three different bio pesticides available in the market. It was found that the fungicide and antibiotic

drugs were more effective but were potent against a particular type of pathogen and

being chemical drugs have bioaccumulation. The three biocides tested were less

effective and target specific. Our biocide formulation, showed best control in fungi

and proved to be effective against bacteria too. It is eco-friendly, possesses wide

spectrum, compatible with many chemical and organic pesticides which are target

specific, does not bio-accumulate, self-perpetuating in nature and cost-efficient.

More importantly, it is made utilizing temple wastes contributing towards waste

management. Future study will involve testing its effectiveness on tomato, barley

and cucumber plants after their inoculation with *P. Syringae*, *D. Graminea* and mosaic virus respectively in regulated conditions. Work will also be done towards

increasing shelf life of the botanical extract using dehydration technique.

Title: COMBINO CHALLENGE

Name: Dhruvi Gupta & Shelly Agarwal Std: 6

Guide: Padma Sridhar

School: Amity International School, Sec-6, Vasundhara, Gzb

ABSTRACT:

COMBINO CHALLENGE

It is a game to understand application of probability which is a subject of Combinatorics. Probability defines how likely certain outcomes are to happen or how many ways a certain event can happen and involve a lot of calculations and counting. Permutations and combinations are an important part of combinatorics as counting involved.

This game is an impartial combinatorial game where the moves for both the players will be same. Its a two player game and there is no restriction on one player over the other. It can be played anywhere, any time as Eco friendly and easily available items like cowry shells and bamboo plate are needed. To decide which player will start the game cowry shells are used as binary dice. In total 6 cowry shells are used through out the game. Out of three games played those who are winning at two games are considered as winner. At the starting of all three games probability of who will start can be calculated using Pascal triangle. This will help not only to understand probability but also to easily remember Algebraic identities using Pascal's triangle. Apart from that at each stage of game one can calculate and understand the probability of winning.

Students can relate this game with real life and understand getting immediate success depends on probability of winning. So one needs to try continuously till they attain their goal.

Title: Fractals in Agriculture

Name: Samanyu Kumar & Advait Sharma Std: 7

Guide: Ms.Aseem Mattoo

School: Amity International school, Vasundhara -6

ABSTRACT:

Our group has chosen the topic- Fractions and Fractals in Agriculture. Every member of the group has contributed by working on a separate farming system prevalent in our country and has come with their own finding. The project has been finally collated by the group members.

The group members have taken the work on drip irrigation, crop rotation, step farming, farming in plains and plateau, etc. The aim of the project is to use mathematical concept of Fractions and fractals in agriculture. Farmers that live upstream have the advantage of always having water; while those downstream have to adapt their planning on the schedules of the upstream farmers.

Here, pests enter the scene. When farmers are planting at different times, pests can move from one field to another, but when farmers plant in synchrony, pests drown and the pest load is reduced. So upstream farmers have an incentive to share water so that synchronous planting can happen. However, water resources are limited and there is not enough water for everybody to plant at the same time. As a result of this constraint, fractal planting patterns emerge, which yield close to maximal harvests.

"Fractal patterns are abundant in natural systems but are relatively rare in man-made systems,". These fractal patterns make the system more resilient than it would otherwise be.

The groups endeavor has been to look at the usage of fractals for effective production in different geographical areas. The group also aims at creating awareness about the fractals in farming.

A survey was conducted so as to find percentage of people who were aware of the use of fractals in farming.

Project Code: Tech-01 Online ID:2196

Title: digiTAC: An Inexpensive Solution for Visual Acuity Testing in Preverbal Children using Deep Convolutional Neural Networks

Name: Ishita Mangla Std: 11

Guide: Dr Pradeep Sharma

School: Delhi Public School, R K Puram

ABSTRACT:

The World Health Organization estimated that around 12 million children around the world suffer from amblyopia and other refractive error complications. Around 2-5% preverbal children worldwide suffer from amblyopia, the most common visual impairment among children. In India, over 75% of the medical infrastructure is present in urban areas, where only 27% of the population resides. 716 million people (72% of the population) living in rural areas usually have poor access to medical facilities and doctors.

Neurocognitive development is greatly dependent on proper eye-neural connections established during infancy. Sometimes, the development of these connections is arrested due to nutritional deficiencies, genetic disorders or lack of visual stimuli. An inexpensive, easily usable system is required to detect visual acuity complications and allow early intervention to prevent further damage. digiTAC is a robust software-only application that digitizes the proven and accepted Teller Acuity Card methodology for testing visual acuity among preverbal children. Unlike other digital visual acuity testing solutions, digiTAC is the first ever fully automated solution that does not require any special hardware or an expert for testing. Independence from special hardware was achieved by utilising a Deep Convolutional Neural Network trained to predict visual fixation on a laptop screen displaying digitized Teller Acuity Cards using an ordinary webcam to capture video frames. digiTAC was successfully tested on 10 subjects in the age group of 6 months to 9 years at a tertiary hospital. As compared to manual testing, single test completion rates were higher (10/11 v/s 8/11).

Title: Anti theft device for vehicles

Name: Manveer singh sethi & Arnav mathur Std: 9

Guide: Radha kumari

School: Amity international school pushp vihar New delhi

ABSTRACT:

Vehicle theft is quite prominent these days. Robbers are becoming more and more advanced and tech savvy. Hence, stealing a car and bypassing today's alarm systems are a piece of cake. A disconnection to the car's battery will suppress all security systems within the car.

Our photoresistor based Anti Car theft device relies on a simple circuit and minute light source to function. A light bulb (preferably LED) is installed under the car. The vehicle is parked directly over the photoresistor (buried a few cms under the ground with covered glass) and left there. The light source remains on throughout the parking time and as a thief approaches and drives/pushes the car off the photoresistor, an alarm will sound inside the owner's house, alerting him. If the robber tries to break the LED under the car, indirectly the alarm will sound as well. So apart from being feasible, its a fail proof mechanism.

Project Code: Tech-03 (Team) Online ID:2186

Title: An innovative caring cane for visually impaired with digital technological solutions

Name: Mihika Malik & Devansh Verma Std: 11

Guide: Radha kumari

School: Amity International School

ABSTRACT:

Nearly 285 million people are visually impaired worldwide, 39M are blind and 246 have low vision. To overcome this we have come up with a device for the visually impaired which would help them walk independently with the help of sensors installed which has a range up-to 36cm.

We used Arduino board which is currently mounted on a cane stick, the basic principal functions is of echo location, the end of the stick is mounted with a sensor which determines the minimum distance between the obstacle and the stick which is connected to a piezo buzzer and a vibrator which activates when the object is closer than proximity range. Letting the user know that there is an obstacle in front of him. Our project is environmental friendly, as we have used solar panels to charge the cane, which lasts up to 6hrs.

The GPS module installed sends the user's coordinates to his family using real time tracking. The GSM module facility enables calling and messaging along with an accelerometer sensor, senses if the user has fallen or is safe.

For future additions Google maps API will be integrated with the GPS module enabling voice assisted directions.

Pricing of the most basic cane with motor, LED, and buzzer system would be ₹2200

Whereas with accelerators, GSM and GPS would be ₹3000

Since the ordinary cane used has to be tapped at and around objects many stray animals and objects are harmed, with the help of sensors the cane won't be tapped around resulting in ease of use and avoiding object collision.

If the impaired person cannot hear the sound due to noise pollution the censor vibrating motion will inform the user about the obstacle ahead.

The LED system installed is for informing people surrounding the user at night for making the path clear for the cane user.

The range of the ultrasonic sensors can be increased by changing the code of the Computer program.

Title: Autonomous Unknown Terrain Mapping and Navigation Robot

Name: Manas Juneja & Ritvik Sehgal Std: 8

Guide: Mrs. POONAM Aggarwal

School: Amity International School, Noida

ABSTRACT:

Autonomous Intelligent Robots are robots that can perform desired tasks in an unstructured environment without continuous human guidance. We built an obstacle avoiding robot that avoids collision with unexpected obstacles continues to move in a given direction.

The robot does this by getting information from surrounding area through mounted tactile feedback sensors on the robot. These sensors upon coming in contact with any external environment passes the information to the micro controller about the location of the obstacle.

Depending on the input signal received, the microcontroller redirects the robot to move in an alternate direction by actuating the motors interfaced to it through a motor driver IC.

This concept can be extended in such a way that if a destination is fed to the robot, the robot can map the whole terrain and can reach its destination by deciding a suitable path and avoiding obstacles. This concept can be integrated with any mobile robot navigation systems. They can also be used for household work like automatic vacuum cleaning. They can also be used in dangerous environments, where human penetration could be fatal.