SRIST TECH ORBITAL

A Technical e-Magazine

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Driven by his mission

AN INITIATIVE OF

SHREE RAMKRISHNA INSTITUTE OF SCIENCE & TECHNOLOGY

APPROVED BY AICTE AND AFFILIATED TO WBSCTE&VE&SD

DAKSHIN GOBINDAPUR, P.S. SONARPUR, KOLKATA 700145 www.srist.in

From The Principal's desk

Today we are proudly publishing ***"SRIST TECH ORBITAL"*** *e-magazine. In these days of economic hardship after the pandemic "COVID-19", it was a challenge for all the Engineering Institutes as well as their management, Faculties, staffs & Students. But overcoming all the barriers SRIST is determined to reach her goals and to re-establish her grandeur. At first we were facing a few problematic situations which had been arising locally, regionally and nationally. But, as an Engineering Institute our motto is not only to find out the problems but also to find solutions and implementations. In these days SRIST has successfully reached among all the students via online classes, remedial classes, doubt clearing sessions, grooming sessions (Technical & Theoretical), mock tests etc. We were able to conduct 20 workshops and we are determined to go ahead through new workshops in a weekly basis. Our most effective implementation is our "INNOVATION & INCUBATION CELL". SRIST has also been nominated for "Chhatra Viswakarma Award 2020", which is considered to be a great success. Apart from that we were able to organize "Job Fares" and provided placements to more than 200 students. Some of our ex-students have also got placements. We know that all of the above successes have taken place by our teamwork and motivation from the management. But these are just the beginning of a new era in the history of SRIST. Our oath is to continue this teamwork and to go ahead until we reach the top.*

Thanks and regards,

Kishore Ghosh,
Principal, SRIST.

Dear Readers,

I am penning down this communication when the world is still struggling to see the day completely free from all the odds we came across in the pandemic over the last year. Humans' innovative faculty to pursue newer ideas, power to overcome all the up streams in lives and the affinity to dream of a brighter day are the great things themselves! Last year during the tough lock down period (in the month of August), the idea of **SRIST TECH ORBITAL** ***(A Technical e-Magazine)*** *was conceived by our Institute and accordingly gave birth to a new club (Technical e-Magazine Club, SRIST). At that time, our club found nothing more appropriate than to choose* **'Technical inventions and ideas to fight pandemic head-on'** *as the topic for the very first issue of the e-magazine. When a thought that has been enduring in the minds becomes real, it is truly an interesting and exciting experience. This new venture of SRIST is one such cherished work. I hope the articles written by our students will certainly prompt you to think that "Every cloud has a silver lining" and every problem how big it is has a solution! I wish this new effort will be successful in unifying the resourceful minds in sharing of science/technical knowledge or ideas at a common platform, direct the students towards a better prospect by enhancing their abilities to seek, learn and apply newer subjects/ideas, and thus, help them to grow as an individual or as a team. The* ***electronic ('e')*** *form of the magazine will make it more compatible with the digital world around and help us to reach many other students, educators and technical professionals at a faster pace. This is the first issue of the magazine and I wish many more numbers to come.*

I heartily thank Dr. Nandan Gupta, Director, Swami Vivekananda Group of Institutes, Mr. Pabitra Gayen, Deputy Director, Swami Vivekananda Group of Institutes, Mr. Kishore Ghosh, Principal, SRIST, Dr. Sonali Sarkar, Principal, SVIST and Mrs. Gargi Roy (Gupta), Principal, SVIMS, Mr. Abhishek Das, Vice-Principal SRIST, Mr. Abhishek Das, Registrar, SRIST, all H.O.D.s and faculties of SRIST for their immense help & support throughout this journey, for sharing their valuable messages with us in this magazine and thus enriching the same. It is quite pleasing to share, many students have enthusiastically participated in the articles writing activity in the college's first Technical 'e'-Magazine and also in different other activities of the club.

I wish you all ***Happy Reading.***

Thanks and regards,

Dr. Swarnali Guha Roy,
Editor, Technical e-Magazine, SRIST.

The increased use of internet and different gadgets often frames a question in our minds that, to gather knowledge about newer applications of science & technology why one should read science/technical books or magazines or journals when the access of various sources of information has become effortless and can be found at a click. The answer is too easy to get; the technical write ups are always the best option to choose, as they help in the dissemination of newer ideas, views and suggestions in the relevant technical fields at multiple levels. They lead in the unification between individual activities or a team towards some common issues. The **SRIST TECH ORBITAL** *(A Technical e-Magazine) is a new venture of Shree Ramkrishna Institute of Science & Technology, idea conceived few months back.* ***Technical e-Magazine Club*** *has set the target of empowering and helping our students by giving them an opportunity to write quality articles on technological advancements, farfetched technical solutions in different sectors found out to evolve and fight against the up-streams. During the lockdown period of COVID-19 when every minute there was a constant urge for betterment and recovery, we found '**Technical inventions and ideas to fight pandemic head-on**' as the most relevant topic for the very first issue of the e-magazine. Technical e-Magazine Club, SRIST, has organized different activities for our students like, Name & Logo Contest, technical article writing, e-poster making & essay writing ('FESTIVE WISHES') activities, essay writing on science which helped the students to explore their ideas and excel. Many students of all the departments of our institute have participated in all these activities enthusiastically and performed very well. Some results of which are given in the **'SRIST, AT A GLANCE'** section of the e-magazine where you could find the activities of the other clubs of SRIST as well.*

We heartily thank Swami Vivekananda Group authority, all faculty members and staffs for their help and support, and we look forward to develop with the new technical ideas for the e-Magazine.

Best wishes,

Technical e-Magazine Club,
SRIST

Message from

Mr. Pabitra Gayen,
Deputy Director,
Swami Vivekananda Group of Institutes.

SRIST always wants its students' all-round development through science and technology, along with the social, moral and aesthetic values of life, because we firmly believe that good, successful and sensible human beings can contribute positively to the society in order to accelerate the progress of the Nation.

Due to the COVID-19 pandemic, time has redefined the progress and development. The future generations should be made aware of the fact that the economic activities must be channelized to the appropriate direction which will yield human welfare as a whole. The time has come to focus on our food habit and Nutrition, Shelter and lifestyle etc., because if people get proper food, nutrition, shelter, and lead cheerful lives, they will be able to live with minimum health problems and the entire human resources can be utilized for development.

In SRIST, it is strongly believed that students will learn technology in a joyful manner. To encourage the students, time to time different initiatives are taken. 'Technical e-magazine' is one of those initiatives, through which our students' technical knowledge and innovative ideas related to science & technology will be expressed.

I hope this initiative will be certainly successful.

Message from

Dr. Sonali Sarkar,
Principal,
Swami Vivenanda Institute of Science & Technology, Kolkata.

'Necessity is the mother of invention'- was the saying of the Greek philosopher Plato.

Human beings, the most superior species on Earth, whenever faced any challenge had tried to solve it with his innovations or adaptability. A need or problem encourages creative efforts in human beings to meet the need or solve the problem. This pandemic has given us the opportunity to introspect into ourselves and taught us that we cannot take nature for granted and destroy or deteriorate it as per our will. Rather we should nurture it and use it for sustainable development as well as for its protection and restoration. The takeaways from the "New Normal" are:

- *We should develop a spirit of resilience and endurance.*
- *If you feel depressed for staying alone as you can't go to watch movies, visit malls, cannot hang out with friends, think about those family members who are battling with a near relative in ICU grasping for breath even with a ventilator and you will feel yourself blessed.*
- *We have seen and felt the necessity to stand by the needy. Generosity doesn't always mean giving huge donation. Even if you give few food packets to the hungry, you are doing something for the society.*
- *Urging others to help and extend their supportive hand is the need of the hour.*
- *With simple household materials, you can make sanitizers, masks and distribute among those who need.*
- *You are seeing your 50 up aged teachers who had not used computers or technology till date are trying hard to cope with this new situation to take online classes to enable you to get your education. You should thank them for their initiative.*
- *You are definitely learning new Technology nowadays which was not known to you earlier.*
- *You are saving a lot of commuting time and can do your classes online from the safe custody of your home.*

- *You can use this extra time to develop your skills in new emerging technologies, Computer skills, communication skills and other Innovative projects and ideas which will help your progress in the future.*

Remember life is a learning process and you learn as long as you live.

Best Wishes for your 'Technical e-Magazine'.

Message from
Mrs. Gargi Roy (Gupta),
Dean, Swami Vivekananda Institute of Modern Sciences, Kolkata.

"Learning is not attained by chance, it must be sought for with ardour and attended to with diligence" – Abigail Adams

The whole world is fighting with the current pandemic, Covid-19, which has not only disrupted our normal life style, but also has taken away our mental peace. The students around the world were suffering as they were unable to go to their institution physically. This disruption in learning and education system could have long term consequences on the quality of education. But the virtual world soon came to the rescue. Online learning is now the new alternative to the classroom learning. Thanks to the advanced technology and network system, our learning continues at ease. Our Institution has also adopted this online learning and education with zest and zeal. The efforts made by our faculties and administrations in coping up with these unprecedented circumstances, along with adopting the new learning techniques to the best of their ability are duly recognisable. Several online platforms helped our faculties to teach as well as communicate with the students. With regular counselling sessions by the mentors, a track of students' mental health was maintained. Besides regular learning, the students are also participating in Webinars, Online debates, Online quizzes, Online special courses organised by the institution that are surely adding feathers in their caps. At the same time the students are also having their dose of fun and entertainment by conducting online programmes. Our Institution believes that learning leads to gaining knowledge that ultimately shapes the career and future of the students. So learning should never be stopped. We also believe that with love, faith, hope and cooperation we can have a better tomorrow.

Message from

Mr. Debaprasad Mukhopadhya (H.O.D.),

Assistant professor,

S.R.I.S.T.

Mechanical Engineering is one of the oldest and broadest branches of engineering sciences. It covers mainly principles of mechanics, thermodynamics, materials science, fluid mechanics, machine design, theory and kinematics of machines, manufacturing science, principles of electrical engineering and production management. The course also covers detail laboratory work on the above subjects including workshop practice, smithy, automobile engineering and carpentry. After going through this rigorous course, the mechanical engineers are ready to take up assignments in design, planning, production, quality control, maintenance and industrial engineering fields. A student taking up mechanical engineering is expected to have immense job opportunities and also scope of advancement in career. Apart from knowledge in working principles and operation of conventional machining and metal forming processes mechanical engineering students are equipped with knowledge of CNC programming, flexible manufacturing system, robotics, rapid prototyping, ultrasonic machining, electric discharge machining, laser beam machining and other advanced manufacturing processes. The curriculum is designed in a manner that maximum stress is on laboratory work, workshop practice and industrial training, to train mechanical engineering students for future shop floor responsibilities. Due to wide coverage and flexibility in the course mechanical engineers are absorbed in wide range of industries from software to heavy engineering and automobiles. We, at Shree Ramakrishna Institute of Science and Technology have one of the best faculty with both academic and wide industrial experience, well-equipped workshops and laboratories, to impart proper knowledge to the mechanical engineering students for their successful career in the future.

Thank you.

Message from

Mr. Sankar Prasad Datta (H.O.D.),
Assistant Professor,
Architecture Department,
S.R.I.S.T.

'Architecture' is completely different from the other branches of engineering. The subject is very much interesting for creative students with some drafting or drawing skills. In one sentence the meaning of architecture is ***"the perception of space within a building"*** *which involves creativity and imagination combined with the realistic situation. Diploma in architecture is a 3 years full time course through which a student can be able to gather knowledge in the field of architecture by which they can be well established in their near future. There are various scopes for our young architects in our modern society in various fields like:*

**All government sectors-in planning divisions,*

**All real estates and developer offices,*
**All architectural firms, all project/building contractor offices,*
**All interior design and decoration firms,*
**All architectural institutions,*
**All project management site offices,*
**All building loan sanctioning organisations,*
**Media offices (as architectural journalism),*
**Legal judicial expert offices (arbitration).*

Apart from these, they can also start their own business in this field. They also have the scope of higher studies in this field by completing the bachelor's degree in architecture (B. Arch.), after that they are also eligible for Master's degree in various special branches like urban design, town planning, landscape etc. so diploma architecture is the gateway of the creative students for their glorious future. In our college the course is performed through theoretical lecture classes, studio work for drawing preparation, preparation of models, AutoCAD computer drawings, seminars and workshops, educational tours etc. the course is conducted by the nos. of respected and efficient facilities: In the previous years, the academic results of our students were also

remarkable. All of them have passed successfully; most of the students scored above 70% marks, toppers scored above 85% marks. Our placement in this branch is almost 100% in every year.

Message from
Mr. Abhishek Das,
Registrar, S.R.I.S.T.
& H.O.D., E.T.C.E. Department,
S.R.I.S.T.

The field of Electronics and Telecommunication engineering is one of the most interesting & exciting fields in today's world. For automation in household applications or in industries or to interact with any automatic system, electronics is the key. Whether you talk about inter planetary mission or remote sensing or smart-city or self-driving cars or robotics or smart gadgets or IOT or electronic communication systems, this branch of engineering is at the core. The Electronics and Telecommunication engineering (E.T.C.E.) department at S.R.I.S.T. has a vision to create high quality engineering professionals who can transform society and earn global reputation by applying their ethical values, engineering knowledge acquired over the three years of the Diploma course. Our department constitutes highly qualified Faculty members with rich experience both in the area of academics, research and/or industry. Apart from these, other experts from different reputed organizations visit our Department to interact with the students and run various industry-oriented technical courses. The department has interactive class rooms and laboratories with latest equipments for the students. We regularly arrange workshops, seminars, competitive events and industrial visits for our students. The three years diploma course in E.T.C.E. focuses on Microprocessor, Communication engineering, Analog electronics, Digital Electronics, Microcontroller & Embedded Systems, Industrial/Power Electronics, Measurement systems, Instrumentation & Control, Computer programming languages and even Industrial projects & Entrepreneurship. The students execute different types of technical projects throughout their studies, which enhance their knowledge & interest towards the core engineering subjects. They work, plan and execute various activities in the College like, Technical Fest which held every year in SRIST. Besides this, ETCE students also participate in cultural programs and different extracurricular activities like, sports, community service programs, college magazines and social activities. The students of our department previously

obtained prizes from the Honourable Chief Minister and also in different activities in our institute. They have also won several trophies in sports and cultural events. Special placement & training programs, grooming classes and different value added programs are also arranged regularly for the students in our college. Many of our passout students are placed in different reputed organizations such as L & T, Tech Mahindra, Wipro, HCL, MyTasker, Airtel and many more. Many of the students went for higher studies in many reputed private & Government colleges, while some of them have setup their own ventures.

Best wishes for the 'Technical e-Magazine' of our institute. Thank you.

Message from
Mr. Abhishek Das,
Vice Principal, S.R.I.S.T.
& H.O.D., E.E.. Department,
S.R.I.S.T.

☐ *IMPORTANCE OF ELECTRICAL ENGINEERING*

Take a minute to imagine life without electricity. The basics of light , heat and transport would be provided by other sources of power, but would they be user-friendly?
If you can imagine life without electricity, electronic devices and computers, you will quickly appreciate the importance of electricity to everybody.

☐ *WHY SHOULD ONE STUDY DIPLOMA IN ELECTRICAL ENGINEERING?*

Electrical engineering is the bridge between mechanical and electronics sciences. Thus, students here in this stream study mechanical engineering subjects like, thermodynamics as well as important electronics papers like, microprocessor and electronic communication systems.

A number of electrical design papers are included as a part of our curriculum. For diploma courses, it is ensured that greater importance is given to practical applications of the theoretical concepts that are taught in class. This ensures that the students graduating from this course are industrially equipped to take on the challenges of the modern scientific world. Our college provides the best guidance regarding project works, various competitions etc. which boosts up the confidence level of the students and helps them to grab the seats of the best industries. Apart from that , our placements has been successful throughout . Our students are working in various

reputed companies and industries like, L & T, Hindware, HCL Technologies, CESC (Haldia), WBSEDCL, Devson Pump, Jindal Steel & Power, TCS and many more.

Message from
Mr. Amit Khan,
Assistant Professor,
E.T.C.E. Department,
S.R.I.S.T.

Welcome to the Department of Electronics and Telecommunication of Shree Ramkrishna Institute of Science and Technology which is one of the premier institutions of West Bengal for Diploma Engineering Course. Our institution is exceptional like a prism reflecting the manifold shades of learning and co-curricular activities (like content writing for technical and non-technical magazine, cultural activities, painting, photography, quiz and debate, sports etc.).

Over the past two decades, Electronics and Telecommunication engineering has played an essential role in improving quality of human life and also contributed to the economic growth of our nation and the world at large. Our department bestows students with the ability to apply knowledge of Electronics and Telecommunication Engineering to work competently in multidisciplinary teams, enriched with leadership and technical expertise, and practice engineering with ethical approaches. The department has first-rate lab facilities which are being upgraded from time to time. The department has highly qualified and experienced full time faculty members who are always engaged to strike a balance between theoretical knowledge and practical knowledge (hardware development, hands on experiment, and also software based experiments and computational aspects).Apart from regular faculty members the department also has many visiting faculties from various premium Universities and guest faculties from various Industries who add value to our programs. Almost all of our alumni's are working in different reputed companies on all over the INDIA.

In this pandemic situation also our institute is the best in providing online theoretical classes on regular basis, video lectures in Youtube for each subjects, virtual lab classes, webinars for our students & faculties, Technical e-magazine publication, online cultural programs, different online competitions & exhibitions like quiz, painting, photography etc.

Thank you.

Message from

Mrs. Sayani Chatterjee,
Assistant Professor,
C.E. Department,
S.R.I.S.T.

❖ ***Why SRIST?***

As we all know, there is no development done without an engineer in a nation.

SRIST is a place where we guide our students during their engineering course to make them ready for the industry. And our placement record since the beginning of the college is excellent. Our students are now established in different prestigious post in different renowned company all over India. A student once admitted in SRIST he or she become a part of our organization. Our college will always stand by them not only during the course but also after the study. So join us and enjoy engineering.

❖ ***Why civil engineering in SRIST?***

Civil engineering is the oldest branch in all engineering department. It plays the most important role in developing a nation. We, SRIST have the efficient and experienced faculties in civil engineering department. We guide our students throughout the course and make them industry ready. We are equipped with advanced laboratory as per syllabus and also here students experience industrial training in diploma course. So join us to make yourself a skilled and efficient civil engineer.

Message from

Mr. Surya Shekhar Chowdhury (H.O.D.),
Assistant Professor,
C.S.T. Department,
S.V.I.S.T.

Welcome students, I am Surya Shekar Chowdhury, H.O.D. of the Computer Science and Technology of swami Vivekananda group. Computer Science & Technology is one of the best and interesting branches of engineering. Our Department is consisted of highly qualified and well experienced faculties and we try our best to provide best infrastructure to our students. I would like to mention that, Computer Science & Technology is a dynamic and rapidly growing domain of engineering and has become an integral part of the world. Every small or big industry greatly depends upon computer science & technology. The job opportunities for the students of the Computer science and Technology in near future are also very broad and the demand is increasing every day. After the completion of the course the students can go for higher studies or apply in the following job sectors:

- *Information Technology*
- *Data Scientist*
- *Development Operations (DevOps) Engineer*
- *Applications Architect*
- *Cloud Solutions Architect*
- *Web Developer*
- *Information Security Analyst*
- *Mobile Application Developer*

Thus, the future outlook, in terms of sustainability and relevance, for computer science professionals is very much positive. The rapid development of Computer Science and Technology everyday has changed the pattern of our thinking and our lives greatly. Various tasks which were previously done manually, having a lot of risk has to be made more effective, faster, and more practical with the application or use of information technology or computer. Covering the use in various fields including business, financial institutions, industry, education, administration and other fields have the desire to realize develop each country. The fact is, computers have become the heart and backbone of society today. Whatever the field, computing has a lot of people taken

over the task. It will not only help in the calculations, store information, detect a decision also to increase efficiency and productivity. But they said it is now clear that the use of computers has been widely practiced and used. In line with globalization and the borderless world, the computer is a machine in the information society is also the main artery of all machinery administration in any field. This is why we can say Computer Science and Technology really have a bright future.

1.1

Pandemics and Human civilization

Rupam Dasgupta, 3RD year E.T.C.E. Department, SRIST

Over the past decades several kinds of pandemics hit the human civilization. Amongst those, some have completely ruined several civilizations and culture. Let us take a look back to see the extent of some pandemics humans came across and the possible way outs then made to surpass.

❖ Bubonic plague

Bubonic plague (also known as 'Black death') is an ancient disease. It was likely to originate in Asia over 2000 years ago and spread to other continents by the trading routes. In Europe, the plague first appeared in the year 1347 when 12 ships from Black Sea docked at the Silician post of Messina. Gradually the disease spread across the other continents with high number of casualties. It was found that the disease, caused by Yersinia pestis bacterium, was transmitted by fleas to the rats and eventually transmitted to other animals and humans. Primary symptoms of plague were fever, chills, body aches and skin eruption with dripping black spots. The pandemic at its hike decimated about one third of the European population. In history, this period is considered as one of the darkest ones the mankind faced ever. The lack of advanced scientific equipments and effective medicines then, made it worst. As preventive measures, the doctors used 'black coats' made up of leather and 'masks' which looked more or less like a 'crow head'; it was purified by using holy water and sweet smelling flowers as it was believed that these could purify it from the curse of the pandemic fallen upon them! The treatments were barbaric. Doctors applied various crude techniques like, the skin pores where poked until they spill out with blood and pus, hot metals were applied on the affected areas and different superstitious practices were also carried out. The disease was so contagious that, from the infected person it spread out like a wild fire. At that time also, people were instructed to maintain social distancing, healthy people kept social distancing with the infected persons, doctors refused to visit the patients, shopkeepers kept their stores closed and the infected dead bodies were burnt. With time, finally this pandemic ended under strict social distancing which relied on isolation to limit the disease spread largely. Even

the darkest cloud of miseries can have some glitters! The outbreak though led to devastating consequences across many nations, but also came out with many inventions like, making papers cheaper, creation of oil-based printing inks which geared up the development of printing presses in the year 1440. In 1665, when plague recurred in London affecting a large percentage of the population massively, Sir Isaac Newton during his isolation period came up with his revolutionary theory of gravity. Afterwards till date, the mankind came across with various science & technological inventions.

❖ Small pox

Small pox is a devastating deadly disease. It first started in Northern Africa, later spread to the European countries via the trade routes. It nearly killed almost 30% of the population of Europe. This time different scientific means have been adopted to transfer the infected materials like, towels, garments and sometimes even the corpses. Later, when the Portuguese and Spanish colonisers went to colonise America they used this virus as a bio-weapon which decimated about $3/4^{th}$ of the population then. One of the first methods applied to control the virus spread of this disease was the use of 'variolation'. It is a method by which a material is transferred from smallpox sores (either by scratching the material into the arm or by inhaling it through nose) to the people who never had small pox. However this technique did not work. Many have died after applying this technique. Later in 1796, Dr. Edward Jenner, an English doctor, observed that the milkmaids who had cow pox did not show any symptoms of small pox after variolation. The first experiment involved a milkmaid (Sarah Nelmes) and another person (James Phipps). Thus, the name of the small pox vaccine was coined from the Latin word 'vacca' meaning 'cow'. More experiments were followed and in 1801 Dr. Jenner published his work in which he summarized his discoveries. Vaccination was widely accepted and gradually replaced the method of variolation. Afterwards different organizations have taken initiatives to eradicate small pox at its root. Gradually by the end of the year 1977, it was found that small pox was eradicated from North America, South America, Asia and finally Africa.

❖ Spanish Flu

The Spanish Flu occurred in between 1918 to 1920; it took lives of 50 million people and infected cases were above it. To restrict the spread of the flu, the people were asked to avoid social gathering. Several new ways were adopted to stop gatherings. On October 18, 1918, at the peak of the pandemic, the city was monitored from a mammoth airplane, at that time it was a novelty. This was less than 15 years after the first flight by the Wright brothers. In that crisis, the aviation technology took a remarkable growth. Today we have the digital platforms for video conferencing, but at that time there were only telephones for faster communication. Afterwards Mr. Henry McCracken, the editor of the Fast Company Technology, did some reading and he was shocked to see that decades back also the instructors used telephone as a medium of communication with their students. However, the advancement of technology was limited then, but the humanity has progressed with a rapid speed towards better technical supports we are having today.

❖ COVID-19

This is the current pandemic we are still facing. Though a century has passed after the last pandemic, we are improved with our technology drastically. We have effective means for detecting the infection and to isolate the infecteds from the non-infected ones by applying various techniques. We are now more able to fight against this new pandemic. We have made PPEs, effective hand sanitizers, preventive facemasks and various other accessories to limit the spread of the virus. Technology has improved to such an extent that, the ‘test kits’ used to detect the COVID-19 infection are manufactured within the span of 2 to 3 weeks only by identifying the structure of the virus. Originally, the disease appeared in the city of Wuhan, China. It is not as lethal as Spanish flu, but is equally contagious and has a very absurd way of evolving. Though the survival rate is somewhat high, the virus has taken a great number of lives till date. This is primarily happening due to our lack of concern and social responsibility amongst the public regarding the disease spread.

1.2

Technical boons to fight the pandemic – now and then

Anubhav Roy Sarkar, Architecture Department, 2nd year, SRIST.

The human race has been threatened by many pandemics from over a long period of time. 'SARS', 'H1N1', 'Ebola' from the past, and now the corona virus has been extensively affecting the human race. However, it is worthy to mention that despite of severe life threats, the present outbreak has taught us how to face the adverse pandemic situation, find out the possible solutions to fight against and manage our lives in the deadly all spheres. Various technical inventions helped in different ways to handle this outbreak, spread awareness amongst the common mass and warn about the current scenario, which helped in lessening the impact of the outbreak greatly even in the harsh lockdown period. In today's world of advanced technology, the application of mobile phones, drones, different other electronic gadgets, cloud space, artificial intelligence, robots etc. has made it easier to seek help when needed, even in the toughest pandemic situation. However, it is very unfortunate that, sometimes the misuse of technology like, the spread fake news or misinformation about the pandemic fatality, about the government policies led to lot of chaos and anxiety amongst the people. In this context also, technology found out the solution. In order to eradicate the spread of the fake information, different globally authentic and registered platforms are working tirelessly to convey true information given by the organizations like, World Health Organization (WHO) or by the government to the common mass. Therefore, creates a transparent scenario by authenticating the information before conveying.

Apart from this, another important technological advancement is 'Artificial Intelligence (AI)' which helped us greatly in fighting against the pandemic over the last few months in various ways. AI has become an essential part of many health care units because the patients can reliably use it by maintaining the protocols in the COVID-19 situation. It is seen that AI systems can forecast the disease spread, health risks, and can even predict the required medication and possible cure when required. Several AI installed trained robots have been implemented in many hospitals, so that they can detect the infection and treat the patients suffering from the deadly disease; thereby restricted the spread of the disease

largely. Thus, it has become a helping hand for the doctors and hospital staffs in the crisis period. Other prominent example is the use of various mobile apps like, Arogya Setu app (India), which has helped us a lot in the crisis period. When this novel pandemic stroked, the first thought came in our minds is, how fast the vaccine or possible treatments can be found out to fight against the disease! **THE WORLD IS DESPERATE TO FIND AN EFFECTIVE VACCINE TO FIGHT AGAINST THE NOVEL CORONA VIRUS.** However, the bitter truth lies in the fact that the invention of the proper vaccine takes sufficient time after going through a prolonged period of trial. The AI has also made this vaccine invention process faster by suggesting the components of the vaccine by studying the research work reports, virus's protein structures and thus, helping the scientists to come to the conclusion at a faster pace.

There are many other technologies like, IR thermal gun, sanitizing tubes that have been used all over the world to protect the people from the deadly virus. A pandemic not only affects the population physically and/or mentally, but also affects the mass financially which drastically threatens the business world of a nation. However, the 'work from home' culture to keep everything going has been thriving all around, which is also become possible because of the advancement in science and technology (e.g., newer electronic gadgets, faster communication techniques). Over the last few months, many have transformed their business into online mode to keep their business rolling. Online payment modes for purchase or sell also enabled contactless shopping and thus, made our lives much easier and safe. The whole process of 'contactless transaction' to 'contactless product delivery' is prevalently dependent on the technology and certainly considered as one of the boons of technological advancements so far. Indeed, in many sectors, the technology has gone into the next level of its advancement and without these technological boons it would be rather an impossible task for us to fight against the 'deadly' situation. Therefore, in the COVID-19 situation, various new technologies helped us to manage our lives and daily schedules in a futuristic and systematic way than it could be without these technological advancements. So it is quite meaningful to conclude that **'technology boons to fight the pandemics - now and then'.**

1.3

Technological windfall in COVID-19 pandemic

Biswajit Bhattacharjee, (2017-2020 BATCH), ETCE DEPARTMENT, SRIST.

Diseases are nothing new to us. Over the decades, the mankind has faced different challenges and heroically defeated all the adversities with the enormous help of a range of science and technological inventions. The list is not very short! The sudden outbreak of COVID-19 has not only threatened our lives, but it has drastically hampered our day to day routines. Every minute we are chalking out how to fight against the pandemic with the aid of the science and newer technologies. For example, the use of *drones* in police for – proper monitoring in the lockdown areas, detecting people who are not wearing masks, proper social distancing in public places etc. has made the work of the police very much manageable. Moreover, the use of *humanoid robots* for *social distancing* awareness in public places or hospital areas also helped a lot. Robots have also been employed for different jobs like, primary monitoring or health check up of the patients, preparation and delivery of the consumable items and so on. Use of *self-directed or unmanned vehicles* in many places is also a big support in the pandemic situation. Besides, the use of *virtual biometric systems* to identity the employees who are working from home has greatly helped in maintaining the data security. Moreover, the use of *virtual health diagnostic apps* has also facilitated health diagnosis processes of the patients at a finger click seating at their homes and maintaining the social distancing rules. The use of e-ticket booking applications for public transport helped to get tickets at ease avoiding public gathering and it has also reduced the corruption of ticket blacking in the pandemic situation. On the other hand, the use of *disinfectant tunnels* in market places, hospitals, offices and residential complexes also prevented the spread of the virus largely. As shown in the figure, the chamber inside the tunnel is so designed that it automatically sprays a mist of disinfectant liquid on the person walking through the tunnel, but the walk should be slow enough to enable the sprayed mist to cover the

garments and bare body parts fully. Apart from these, the *hands-free door openers or hygiene hooks* also helped to prevent the spread.

Initially, the outbreak of COVID-19 was at its hike to distort the system of education, but finally in the hands of the technology it rested upon. The students continued to learn and the teachers continued to teach using different digital platforms during this tough time. Such initiatives have been found to be implausibly beneficial for the teachers and the students; and thus kept the knowledge transmission uninterrupted, as a society can never develop and no mind can flourish with newer ideas of creativity without education. Though the students are isolated in our homes over this period, which might have increased their level of anxiety and depression many folds but side by side, different free online services like, *online e-magazines, educational courses / webinars* offered by many reputed institutes worldwide and online participation in different kinds of activities like, quizzes helped them to reduce their anxiety and keep learning every day.

The proper use of the *social platforms* like, Whatsapp, Face book also aided a lot. Through these services the experts / doctors were able to give suggestions or can answer to the queries of the patients about the diseases, in the COVID-19 pandemic situation. Such services helped us to reduce the fear of disease to a large extent. Moreover, the use of different *telemedicine apps* for online order of medicines, request for health diagnosis over phone in case of an emergency also supported enormously to control the virus spread. It is indispensable to control the spread in order to save human lives. However, instead of shutting down everything, it is required to get the solution, that is, the proper medicine and/or the technology instead of lockdown. But we have to remember that no matter how much the technology improves, we should realize the proper utility of technology and thus use it effectively.

1.4

Fighting the pandemic with augmented reality and AI

Shuvo Das, 2nd year, M.E. Department, SRIST.

The present pandemic has created a worldwide panic. The Novel corona virus has been found to change its form with respect to the host's body. A large number of people are getting infected every day, many have died and however many have recovered completely. The virus has potentially threatened the society as the proper medicine or vaccine is not yet available to fight against the virus. If we try to understand the pattern of contamination, we will find that the social distancing can prevent the spread to some extent, but the people who are dealing with COVID-19 patients everyday must be equipped with proper technological accessories to combat the tough situation. Use of robots is one of the way outs; by using these the patients' vital activities can be looked after, robots can be used to maintain cleanliness and sanitize the hospitals, in public transports, delivery of medicines at the door step, food delivery by maintaining proper social distancing and many more. Besides, the automatic free test kit dispensing machines have been installed in many hospitals to make the sample testing process faster (using RFID tags for proper identification of the patient). Augmented reality and AI can be employed to detect contamination / infection on the surface or in person. We can also use mobile applications which can track the physiological data combined with the daily symptom reports to predict the illness. The aim of such study is to build an algorithm to identify pattern at onset, progression and after recovery from the COVID-19 infection.

Though, the tragic events of joblessness, food scarcity, academic isolation and suicidal news increased exponentially over the last few months worldwide, however, on the other hand, alternative ideas like, online mode of work are implemented which may not replace the offline work culture, but helped a lot to thrive in the burning pandemic situation. Despite of the fact that all the unfortunate events happened over the few months will remain in our minds for decades, but how bravely we all fought the battle against the COVID-19 with the help of medical science & different technological inventions will always be recalled as our achievement for life time.

1.5

Role of robots to fight COVID-19 pandemic

Akash Sarkar, 2ND YEAR, M.E. Department, SRIST

Like many other nations, India has also gone through the strict lock down periods over a long time in order to limit the spread of COVID-19. To break the chain of the outbreak, Government strictly instructed the people to stay at homes over the lock down days, but due to various reasons like, financial crisis, scarcity of food, need of medicines or other consumables it was difficult to completely stay at homes, though, people tried their best to maintain the lock down rules then. Under different up streams, various technological inventions came in forefront like a big support for all. Technology always tried to help us hands fully to make the tough scenario quite easier, i.e., helped us to stay at our homes and at the same time to keep our work going, get our daily needs at our doorsteps. Technical inventions include the use of robots, drones and different gadgets. The robots have been used in hospitals, hotels, restaurants, shopping malls and many other places, which made it easier to maintain social distancing and helped in restricting the virus spread amongst the people. As the disease spreads through human to human communications, especially at congested places, so under such conditions, the robots played a vital role. For example, in restaurants, the robots have been employed to welcome the customers, serve food; in many hospitals, a large number to robots have been used as nurses or as other helping hands for the doctors. They deliver medicines and food to the patients, disinfect hospital areas. In shopping malls and many other public places, robots have been used at the gates to check the customers' health condition as well as helped in sanitizing. In many countries, robots have been employed as the door-to-door delivery persons to supply food, medicines and other necessary items to the people in the crisis period. So as the blessing of technology, the robots have played an important part in reducing the extent of the outbreak.

1.6

Humanoid robots in COVID-19

Trisha Dey, 3rd year E.T.C.E. Department, SRIST

As we travel across the globe, different types of infectious diseases also spread across. So far, the mankind has passed through different kinds of outbreaks, but not all have reached their peaks like what we have observed in case of the present Novel corona virus. The situation is such that, every day we see the graphical plot of the number of infected people is hiking! To fight against the situation, fruitful implementations of different technical ideas came into play and helped immensely. One of those is the 'humanoid robot'. Initially, humanoid robots were used as scientific assistants in research laboratories. The human body structure and the patterns of human behaviour were studies to design humanoid robots. 'Human behaviour recognition' is an important area of research, which focuses on how the human beings are stimulated from the sensory information to decide their reactions. This scientific knowledge has been applied to build up the computational models/algorithms to match with the human behavioural features and has been found to improve with time. In the worst COVID-19 pandemic situation, such humanoid robots played a vital role in helping the doctors and the hospital staffs to fight back. These robots have not only used to disinfectant the hospital floors, routine body temperature check up or other primary health check up of the patients, but also helped in doing the tasks like, arranging video calls with the expert doctors in case of an emergency. Thus, made the overall process faster and helped to maintain social distancing amongst the people. In the above figure (picture collected), a real picture of a 'humanoid robot' in an Indian hospital is shown. The humanoid robots are found to assist the hospital staffs and helped them to stay safe. The patients, visitors and staffs at the entrance of the hospitals and other public places are checked by the robots to ensure, if they have any COVID-19 symptom. These robots use LIght Detection And Ranging (LIDAR) and Simultaneous Localization And

Mapping (SLAM) technologies for the detection of objects come in their paths to avoid collisions and have a number of sensors (more than 60 sensors) embedded within it in order to increase the mobility and response accuracy. They use open Application Program Interface (API) system which permits further customization. In India, 'Milagrow HumanTech' is a Gurgaon based Indian company who manufactured humanoid robots. The battery support has been found to be 12 hours after a single charging and it requires 4 hours to recharge fully. The 'Invento Robotics', another an Indian company in Bangalore, also manufactured humanoid robots which have been employed in different hospitals like, Apollo hospitals and Fortis hospital (Bangalore), used for the disinfection of the hospital areas using ultra violet (UV-C) rays. It has also been employed in Yatharth super speciality hospital in Noida. The robots have been also used in various other public places like, offices, retail stores, shopping malls.

To what extent the technology may advance, the human brains (the creator of all these) are much faster and filled up with cognitive ideas and capabilities. Hence, we the humans with positive mindset and unity can make the world a better place to live and make all to see a world free from the adversities we are facing today.

1.7

Technical inventions and ideas to restrain the pandemic head-on

Avijit biswas, 2nd year, E.E. Department, SRIST

On 31st December, 2019, a cluster of cases of pneumonia due to some unknown cause emerged in the city of Wuhan, Hubei province in China. In January, 2020, a new virus was indentified and subsequently identified as the Novel corona virus. Common signs of the infection in humans include - high fever, cough and breathing problem. At its worst, it severely affects the body organs like, lungs, kidneys or multi organ failure.

☐ **Some noticeable technical inventions we came across to fight against the pandemic situation,**

- **Foot operated sanitizing machine:**

The foot operated touch less hand sanitizer dispensing machine is made up of minimum number of components, parts, and as a result it is small in size and light weight. The light weight and small size make it easy to use and handle easily when required to deploy from any location.

- **Sanitizer tunnel:**

Sanitizer tunnels (also called *disinfection tunnels)* have been used in shopping malls, market places, railway stations, airports and many other public places for sanitization. As you enter the tunnel, the nozzles fitted inside it spray the disinfectant mist on you, which kills the germs and viruses including, the COVID-19 one.

- **Touch-free sanitizer dispenser:**

Amidst the COVID-19 pandemic, health experts have emphasized, how importance is to keep our hands clean either by using proper sanitizers or soaps. To reduce the chances of infection, touch-free sanitizer dispenser machines designed by using sensor-based smart electronics have been used.

In conclusion, it is important to mention that though science & technology are doing their parts their best, but we as the responsible citizen of the Nation have to do our parts in this tough critical situation to keep ourselves safe. To limit the virus spread, maintain at least 1 meter distance between yourself and others; avoid touching our eyes, nose and

mouth with our un-sanitized hands because when we touch the other bare surfaces of our bodies, the bodies easily pick up germs and viruses, and from the hands the viruses can enter your body and infect us. To protect ourselves against COVID-19, we need to clean our hands frequently using alcohol-based hand sanitizer or with soap and water. To what extent it is possible, try to stay at home; avoid social gatherings. Isolate yourselves even if you notice minor symptoms of COVID-19 such as, fever, cough, headache in yourselves.

1.8

Manufacturing of Cost Effective Sanitizing Machine

Pritam Hazra and Surajit Sardar, 3rd year, M.E., SRIST.

Sanitizing with chemical compounds is one of the most common and economical methods of ensuring a safe and bacteria-free surfaces. When disinfectants are used to the kill microorganisms on the body surface, they are referred to as antiseptics. When active ingredients are used to sanitize the hands, they are referred to as the hand sanitizers. A few potent active ingredients can also be used in high concentrations to sterilize medical equipment, such as, surgical endoscopes, without heat. Formulations that sterilize the medical equipments are called cold sterilizers.

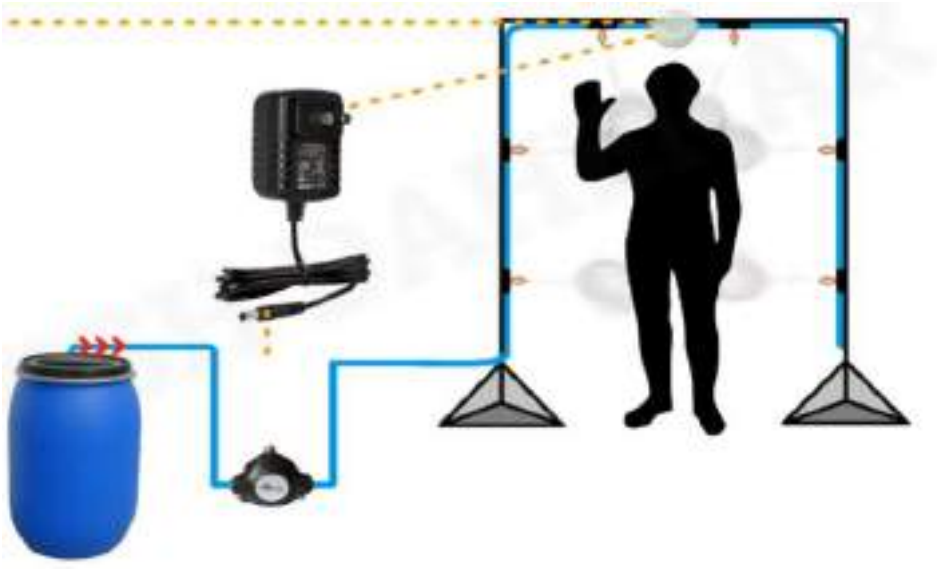
The list of accessories, tools and/or equipments required with their approximate costs:

1. Brass nozzles (0.1 mm diameter) (6 to 8 pieces): Rs. 250-300
2. 1/4" T-connector (8 pieces): Rs.100
3. 1/4" RO pipe / tube (15 meters): Rs.150
4. High PSI DC pump motor (80 to 250 psi) high speed motor 12v-24v :Rs.1000
5. Adapter: Rs.200
6. PIR ultrasonic or microwave motion sensor: Rs.400 to 500
7. Sanitizer solution: Sodium hypochlorite solution etc.
8. Screws, zips, tapes: Rs.80-100
9. PVC pipe: Rs.300
10. Plastic drum or container to keep the sanitizer solution: Rs.100

To fight the pandemic head-on, it has become essential to sanitize our hands time to time, so here a process will be described how to make a body sanitization machine for office or home use in very low cost:

1. Firstly, we will need a metal structure which is easily available in the markets at very low cost, or we can make it ourselves from the scrap materials.
2. Then, we need to fix the PIR ultrasonic or microwave motion sensor at the top of the metal structure to detect the person to be sanitized.
3. Then, we have to fix the brass nozzles accordingly through which the sanitizer solution will be sprinkled on the person.
4. Then, the pipe is to be connected with the nozzles with the help of the T-connectors.
5. After this, fit the pipe with the metal structure with the help of the zip ties. We can also use insulation tapes to make the fixation more rigid.
6. Now, fix one end of the motor with the pipe and connect the other end of the motor with another pipe; then dip the pipe in the drum containing the sanitizing solution.
7. Finally, we have to connect the adapter with the motor and with the output of the motion sensor.

The figure below shows the block diagram of the overall setup.



A pictorial view of the overall setup

We hope such a cost effective and easy made sanitizing machine will help all of us to fight the pandemic head-on through proper sanitization of our bare body surfaces and

the exposed garments as sanitization has become an essential part of our daily lives to maintain hygiene. We can easily use such a sanitization machine in our homes as well as in offices or institutions.

1.9

Battle with the pandemic head-on

Somia Mukherjee, 3RD YEAR, E.E. Department,SRIST

We all are well aware of the ongoing pandemic. The basic difference between a disease and a pandemic is that, a disease can be cured with the help of certain medicines but on the other hand a disease takes the form of a pandemic when it is unknown, nobody knows how to cure it, or no such medicines are known.

Mankind versus Corona Virus

☐ Technology at its Best

COVID-19 has affected the people all over the world with notable casualties. In such a situation, the technology comes in forefront. We always try to find a technical solution to fight against the situation, as the technology is much advanced nowadays. In fighting against the pandemic, we came across several technological inventions. Some notable amongst those inventions are like, the use of emergency ventilators which is an artificial life support for the critical patients, specifically made for the COVID-19 patients.

Emergency ventilator

Another notable invention is the use of 'Smart Helmets', as shown below. The speciality of this helmet is that, the person who is wearing it can sense the body temperature of other people passing by with the aid of AI (Artificial Intelligence) and AR (Augmented Reality).

Smart Helmet

Some other inventions include, germ trapping snoods, plastic made protective capsules, protective phone booths, cleaning and sanitizing robots, hands free door openers and many more. Above all, the ideas which the people are continuously applying in their daily lives such as, proper social distancing, maintaining lockdowns, use of protective hand gloves, head caps and facemasks as preventive measures have facilitated a lot. All these way outs are helping the human beings to fight against the pandemic head to head and gradually transform the world to its original pure form once again. We all hope that everything will be fine once again very soon.

1.10

Technological interventions in today's scenario

Aman Sinha, 2nd year, E.E. Department, SRIST

The COVID-19 pandemic has taken a severe toll not only on human lives but it has drastically affected our economy. Since the onset of the outbreak, the doctors, scientists and common people are trying to find the solutions to tackle the contagion.

☐ Technical interventions for the welfare of humankind:

The use newer prototypes like, robots, virus killing snoods and portable isolation capsules clearly demonstrates that what humans are capable of in the face of adversity. Here are some of the technical inventions developed to combat the current outbreak which has killed more than 217,000 people and infected 3.1 million worldwide. The COVID-19 attacks people's respiratory track and eventually the lungs making it hard to remain operative. Emergency ventilator is a kind of equipment which feeds oxygen into the lungs to save lives. Though, the hospitals have struggled with a shortage of such emergency ventilators at the beginning of this outbreak, but in response, engineers, physicians and other creative minds with their joined efforts developed ventilators at a lower cost. In the United Kingdom, Dr. Rhys Thomas, along with engineering company CR Clark & Co of Amman ford, in just three days developed a simple and robust ventilator, which as well as helped the patients to breathe comfortably and also helped to clear the room from any viral particle.

Another innovation from the UK was from Manchester biochemists - a mask with "germ trap" technology the result of a 10-year project with the biotech firm Virustatic. The masks are safe to wear and according to the developers, the virus becomes inactive after touching the mask fabric.

☐ Perspectives to usher the mindset of growth and productivity:

One of the positive aspects of the current pandemic is that it has clearly highlighted more than ever before, the importance of technological inventions, feeding science research laboratories and R & D sectors worldwide enabled us to continue our battle against deadly disease. According to the current situation it is noticed that technology is

taking a long leap to cater to the needs of the society and also to understand how technical growth worldwide can figure out a pandemic outbreak and reduce it to a large extent. With the growth of science & technology, the human beings can reach to the level of productivity for understanding the layers of technicalities to bring change in the areas of globalization and optimization.

1.11

Winning over the pandemic with newer ideas

Subham Manna, 3RD YEAR, E.E. Department, SRIST

Over the last few months, the world is in a state of pandemic. Many technical inventions helped us greatly to fight against the adverse pandemic situation. We are living in a technologically modern time, where there is no better way for us than to fight against the adversity with newer ideas and technical inventions like, different electronic gadgets, equipments designed beforehand or specially designed to fight against the disease.

- **MASKS:** To limit the community spread, it is advised to use masks. Surgical masks have been used tremendously for this purpose. However, different other types of masks have been also advised. Most effectively, three or four layered with specific type of fabrics or the masks with filtration layers sandwiched in w the outer two layers have been preferred.

• **BUZZING WRIST BANDS**: Companies are rolling out wrist band which buzzes when we touch our face. Its accelerometer senses our hand movements ten times per second.

- **HOME DELIVERY ROBOTS** are being operated to deliver food. In this pandemic, wheeled robots have moved onto the pavements in greater numbers.

- **'SOCIAL DISTANCING' ROBOT** (made by Boston Dynamics, Singapore) can be put in a particular area ('Spot') to maintain social distancing among the people. It patrols parks and reminds visitors to maintain social distancing.

Thus COVID-19 is a threat. Mostly the poorer communities, minorities are affected. The lockdown hit the low-income workers the hardest. We should be thankful to our doctors and health workers for their sacrifice. When this all will be over, we will have them to thank for it.

1.12 Use of thermal imaging systems, oximeter and sanitizing tunnels

Sushmita Naskar, 3rd YEAR, 3rd year, E.T.C.E. Department, SRIST

From the inception of COVID-19 in the late last year, it has been a common urge worldwide to find out the techniques to detect the infection and its possible treatments. Various technological inventions so far came into play to combat the harsh pandemic situation. Though the common and primary symptoms of the COVID-19 in humans are like, fever, body ache, fatigue and/or loss of taste, smell, but everyone with a high fever may not have infected with corona virus and not everyone with the virus gets a high temperature! So the temperature screening systems "may not be very effective" to identify COVID-19 infection, remarked by the World Health Organization. Such systems can identify the peoples' unwell with fever for any other reason too (called false positive cases). However considering high fever as one of the most common symptoms of this disease, different types of electronic systems, e.g., thermal imaging systems have been used. Besides this, due to the infection the oxygen level in the blood of the infected person is found to decrease drastically, so proper monitoring and helping to control of the same is very important. For this purpose, oximeter did a great job.

☐ **Thermal imaging system** also known as tele-thermographic system have been used to measure the surface skin temperature of humans while entering the hospitals, shopping malls, offices, schools and other public places. Such a system includes an IR thermal imaging camera and may have an inbuilt temperature reference source. The thermal imaging systems and the non-contact IR thermometer (NCIT) use different forms of IR technology to measure the human body temperature. In 1929, Kálmán Tihanyi, a Hungarian physicist, first invented the infrared-sensitive (night vision) electronic television camera for anti-aircraft defence in Britain. The principle of infrared thermographic system is based on the physical phenomenon that, an object (may be human body surface) at a temperature above absolute zero (-273.15°C) emits electromagnetic radiations. The person who handles the thermal imaging system is not required to be physically close to the person being evaluated. In fact, the person who

handles the thermal imaging system could be in a different room and it is quite faster than the typical forehead or oral thermometers that require a physical contact with the person to be monitored. A thermal imaging system detects objects by using the emitted IR radiations from the objects; thus creating an image based information. Usually these images are in gray scale; 'cold' objects are imaged as black or darker colours and 'hot' objects are imaged as white or brighter colours and grey or intermediate coloured images indicate the variation between the cold and hot objects.

Thermal imaging systems

☐ **PULSE OXIMETER:**

Pulse oximeter

Besides another lifesaving electronic system is oximeter which is usually clipped on a finger of the human being whose oxygen level in the blood is to be monitored. During the World War II it was used by the military pilots to measure the oxygen content in their blood when they are flying at high altitudes. Generally, oxygen level in human blood should be in between ~ 95 to 100%, but if it decreases below this range then it is considered as the person's unwell. Oximeter electronically measures the changing in absorbance of wavelength through the body and detected by the photo-detector, excluding venous blood, skin, bone, muscle fat etc.

☐ **SANITIZATION TUNNEL:**

Tunnel made to automatically spray the disinfectant liquid on the human beings entering the tunnel. Disinfection tunnel is usually 16 to 25 feet long which sprays disinfectant liquids on people as they pass through the tunnel. It is considered that a 60

second exposure to a spray can destroy the virus that may have landed on one's skin and clothes. Doctors remarked that the sprayed disinfectant can be harsh and may lead to severe skin problems or may cause other serious health problems. As per the recommendation of the Supreme Court, all concerned authorities were asked to stop the use of such tunnels, as to some extent they are found to be harmful.

1.13

'Our fight' - against the pandemic head-on

Abhirup Sarkar, 2nd Year C.E. Department, SRIST

We are well aware of the fact that, due to the ongoing pandemic worldwide, we have started a new pattern of living. In this prolonged pandemic situation, various initiatives and anticipatory measures have been taken to fight against the situation, and in doing this, we have subsequently moved into a new normal pattern of living! Our work schedules, methods of working, ways to manage things, our food habits and health condition monitoring have changed significantly. We learnt a lot from this crisis about our health hazards, level of immunity and what to do & what not to do to combat with this deadly virus. Even after a long period of odds, we still have the immense courage to move on towards betterment. In this pandemic situation we have celebrated various festivals like, we celebrated Navaratri, Durga Puja, Diwali, Guru Nanak's Birthday, Cristmas and New Year 2021 by maintaining the strict protocols of COVID -19. Before the onset of these festivals, the Government took various steps to restrict the community spread. Before Durga puja, the Government has strictly instructed Puja organizers to make the puja pandals smaller in size and short heighted so that the whole pandal area can be sanitized easily. Puja budgets were cut down to the minimum, many puja organizer have even cancelled their pujas and instead various community service programs have been arranged by many puja committees. Inside the puja pandals mass gatherings were strictly prohibited. Special preventive measures were taken for sanitization; mask wearing was a must, masks were distributed by the puja committees

to limit the virus spread and so on. IR thermometers have been used to monitor the body temperature of the people in many places. Pandals were built in such a way that they can be seen from distance. Many puja organizers have telecasted their puja online via different digital platforms like Facebook live and even the rituals like, Durga Asthami Anjali were arranged in online mode at many places. Despite of various steps taken by the Government and different organizations to restrain the situation, however, it is always our responsibility to properly maintain the preventive measures, and also not to spread rumours / fake information about the pandemic through any media (‘take care before you share’), which could create undesired chaos and panic amongst the common people. We will definitely win over all the up streams in the near future as we did in the last few months, if we have faith and courage in our hearts.

1.14

Panacea in utter darkness

Anuska Roy, CE Department, SRIST

"Please breathe", over the last few months I think this might be the most tragic yell of the doctors before the patients’ beds! Though this ongoing pandemic has threatened human lives all over the world, however, in this crisis period the seven lettered power that is ‘SCIENCE’ came to us as like the ‘lucky seven’ and has become the panacea for all of us like a lamp in utter darkness. Struggle finally results in success. Worldwide a struggle to get the effective vaccine is going on and very recently we are seeing the light of hope. In India, during huge crisis, at the onset of March, 2020, IIT (Delhi) came out with their new invention of cost effective ‘test kits’ (for COVID-19). Companies like, RIOT LABZ PRIVATE LIMITED, Noida, made Automatic ‘touch less hand sanitizer dispensing machines’. A Seattle based company (Slightly Robot) introduced wristbands which can automatically alert the users when they are about to touch their mouth, nose or eyes unconsciously. In addition to these, the online educational classes have greatly promoted different digital platforms for video conferencing and social media.

1.15

Technical measures and precautions to fight COVID-19

Ankita Ghosh, 2nd YEAR, CST Department, SVIST

It is said that, 'Technology is for the people, by the people and of the people'. A pandemic might have resulted from different causes; technology cannot avert a sudden onset of a pandemic. However, technology plays a key role to control the situation at a large. In the recent past and still ongoing pandemic, we have clearly seen how various technological inventions have come into play and helped us to prevent the virus spread and thus, saved billions of lives worldwide. In the harsh pandemic situation, we are able to fight back and still surviving due to proper medication, availability of different advanced diagnostic systems, the technique employed for detecting the infections, spread of awareness about the precautionary measures like, social-distancing, use of proper masks, technology for sanitization, and AI or robotic systems like, facial recognition systems helped to identify the infected people. Apart from these, the use of drones for keeping eyes on the containment zones; use of robots in health-care units, factories etc. made the overall situation manageable and safer. The World Health Organization (WHO), Government in all nations, experts from different sectors are trying hard to improve the situation. One of the simple example of this, in India the mobile phone service providers immediately after the onset of the pandemic started to alert people about the disease spread with the help of setting mandatory caller-tunes, which has really helped a lot in lessening the virus spread. In every family, we must keep the primary diagnostic equipments like, thermometer, pulse-oximeter, blood pressure checking, sugar level and pulse rate checking machines. We should remain aware of this deadly disease not only for now, but also in future. The humanity with immense positivity and handful fruits of science & technology is quite hopeful in seeing a world free from the rage of this deadly virus very soon.

1.16

Technical supports to win over!

Gairika Dutta, 2nd year, Architecture Department, SRIST

Any pandemic imposes enormous burden to the human lives, the economic and the social stature at a large. A pandemic can be defined as *a new disease that rapidly spreads in a number of countries over a certain period of time.* Novel corona virus (COVID-19 disease) is the most recent and the ongoing pandemic which has resulted in unprecedented social and economic impacts on our lives. In human body, this virus initially affects the upper respiratory tract and eventually causes various symptoms like, high fever, pneumonia and other illnesses which in turn adversely affect the nervous system. Though, over the last few months we across various issues like, the everyday increasing number of the infecteds, sometimes the misinformation about the number of fatalities, diagnosis systems, invention of vaccine and also fake news about government policies, which created a more panicked situation among the mass but the technology at its best always lend a helping hand to combat the situation. For example, the concept of *work from home* may not be a new concept in corporate sectors, but over the last few months it has become the only way out of many of us to continue our work, which is one of the fruits of the technological advancements. It is found out to be one the far-fetched solutions that helped us to keep our work going over the lockdown periods and has become the new normal for us! Besides this, *the facial recognition* systems along with the *data scan* is another important example which accurately identifies the people even when they are wearing masks. Such identification techniques are found to be effective in monitoring and tracking people who are in quarantine. The *CCTV cameras along with such facial recognition systems* have been used in hospitals in identifying the infected people who tries to break the rules and step out during their quarantine days. Thus, it becomes easier for the hospital staffs to attend them.

Apart from these, *the drone assisted delivery system* is another way out which made the delivery of urgent medicines or other essentials in a safer and a faster way. Moreover, the *use of technology in travel and tourism* is also very much effective. For instance, the e-ticketing system in railways provides auto-responses to the millions of passengers via chatbot AskDISHA (an initiative in India) applying Artificial intelligence and Machine

learning, which has been found to be a useful way in the pandemic situation. Use of *self-driven unmanned cars, drones and robots* in various sectors of different countries also helped a lot in the pandemic. In crises, the automatic health monitoring systems implemented in many hospitals has been a big support which has made the primary health check up processes faster. The *digital meeting platforms* like, Google meet, Go to meet etc. have enabled us to continue our work from home in arranging / attending important real time office meetings and/or online educational / activity classes, which helped us all to avoid mass gathering. It helped both the teachers and students to communicate using their palmtop android phones or desktop computers / laptops.

Thus, over this current COVID-19 situation we learnt a lot. We now understand that we were not geared up for this sudden outbreak then. After a long period of everyday challenge now we can say that the next pandemic is not a matter if it happens, but we should remain prepared in advance as an individual and collectively! Though, the technology will keep on advancing and serving us every day, but it is also our primary duty to keep everything simple by leading a simple life with elevated thoughts, to improve our life styles and food habits. I hope these will certainly help us to combat all up streams in future.

1.17

'We' in the pandemic

Saptak Saha, Architecture Department, SRIST

At a high time of the global emergency, when every individual and society are massively impacted by the strict lockdowns for the sake of our lives, restricting our social communications, the effective analytical methods are required more than ever. The most recent and still ongoing rife i.e., COVID-19 outbreak came out with enormous research works to give a better support, not only in detecting the infection in the patients' body, but also helped to understand the various ways of the virus transmission among the humans and to find the possible cure with the aid of newer developments and inventions. It is really heart-rending to know the fact that even after a long time of horrific nightmares of pandemic, we are still living with us the virus! The mankind still cannot defeat its rage fully. So until it is defeated and gone, we should remain alert and adapt ourselves in a new

normal environment and learn to live with it, but by maintaining the strict preventive measures in a more responsible manner. Over the last few months, various technical inventions and supports have come into play like, online educational classes for students, work from home concepts, e-marketing and so on. To support, the Government have also taken various initiatives for the public welfare. It is required to make sure that each and every citizen of a nation should be supported by the basic daily needs and consumables during this tough time. Basic resources to survive should reach every corner; there should not be any discrimination – between slums, rural people and urban lives. Living in a pandemic and to keep our work going is hard without proper internet connections. So another major resource that should be provided to all is the proper internet connectivity, even in remote areas to what extent it is possible. Cheaper internet charges should be applicable for economically weaker sections for their benefits. Mode of education can also be changed; e-classes with proper electronic library must be prioritized to some extent. Government and private companies should open more online jobs in which people from every section can get employed. Apart from these, every country is trying its best to develop a vaccine in this crisis, but in my opinion, all countries should collaborate in the invention and the making of the vaccine. More the number of brains will be involved the faster will be the outcome. Unity can make wonders! If the whole world unites together then we surely can defeat the pandemic soon. Though, this step is something tough to achieve, but *a pandemic like COVID-19 can only be defeated by taking united steps.*

1.18

Role of Technology to Fight COVID-19

MD Akrom Hossain, Architecture Department, SRIST

The COVID-19 has exposed the humans' fragility along the downside of the interconnected world, but thanks to our technological advancements so far, that we are more equipped with advanced techniques than we have seen in any era of history to respond to a harsh pandemic situation. In 2002, when SARS broke out, the scientists took more than a year to decode the genome of the virus, whereas with the help of the advanced technology, the Corona virus genome has been identified within a month. The proper use

of technology played a crucial role to fight against the virus. China is a good example, though being the source and one of the worst hit countries in the early stage of the COVID-19, has managed to stop the spread of the virus. Government agencies and first responders used various positioning technologies and satellite monitoring systems to precisely point out the risky areas, accurately assess the situation and carry out the relief operations. It can also be used to select suitable places for building and installing various required medical facilities and in monitoring their progress. Then robotic technology has been also used in various scenarios. Robots have been used in many hospitals, educational institutes. Drones have been used for transportation of supplies and disinfecting purposes without any human contact. Health sensors and applications for personal monitoring has been used. Artificial intelligence in big data analyses, facial recognition, mobile tracking, mass surveillance and for medical purposes have been immensely used.

In history we have witnessed that time to time the technology played a major role in crisis periods. This Corona virus pandemic is no different. Proper use of technology is the most effective way to fight against the virus and minimizing the casualties.

1.19

Some critical inventions in pandemic

Nibedita Das, 3rd year, CST Department, SVIST

Pandemic is referred to the spread of a disease in a large number of countries over a certain span. History shows, different kinds of pandemics always hit the mankind harshly. Taking into account the most latest one (the COVID-19) which has tried a lot in bringing the whole world down and affecting the human race at its worst, but the science & technology came to us blessing. One of the major technological inventions which helped greatly in this pandemic situation is the availability of the 'emergency ventilators'. Basically, a 'ventilator' is a machine (modern day ventilators are computerized-microcontroller based) which provides ventilation by moving breathable air into and out of the lungs to deliver oxygen to the patients who are unable to breathe normally. However, at the sudden onset of the outbreak with the rapid increase in the number of patients, the hospitals faced crises and struggled with the shortage of the

ventilators. To eradicate this problem, Dr. Rhys Thomas, UK, along with CR Clark & Co. of Amman ford, an engineering company, developed a simple and robust ventilator in just few days, which saved many lives of the patients by enabling them to breathe comfortably, and to some extent, it also clears the harmful viral particles in the quarantine rooms.

Other technological supports, e.g., to reduce humans' exposure in the most contagious places, a Belgian 3D company (Materialize) has made hands-free door handles, consisted of two simple parts (as shown below). It can easily be screwed on the either sides of a door, thus allowing people to use their arms or elbows to turn it.

The present pandemic has taken a severe toll on human lives affecting the overall scenario worldwide. The industries, health, education, jobs have been challenged severely. From the onset of this outbreak, the doctors, scientists, hospital staffs and the common people are breathlessly trying to tackle the contagion. The use of newer inventions like, robots, virus-killing snood, portable isolation capsules clearly depict the abilities of the humans to face and fight against the adversity under all circumstances.

1.20

The fruit of crisis

Mithu Mondal, 3rd Year, CST Department, SVIST

The present pandemic has undoubtedly brought us to a new sphere. Where every minute we are trying to figure out the possible ways to survive, but hardly spent time to notice how the newer inventions of science & technology are giving us their fruits in this tough crisis period! These fruits are invaluable. History shows that every big crisis has sorted out with bigger inventions, i.e., the crises are the inspirations for innovations. In this context, Bill Gates commented, *"During World War II, an amazing amount of innovation, including radar, reliable torpedoes, and code-breaking, helped end the war faster."*

Different technical inventions like, automatic sanitizer dispensers, robotic systems used to measure patients' primary health conditions like, blood pressure, body temperature, use of smart trolleys to carry medical equipments, medicines or meals to the patients, which enabled to maintain social distancing and also reduced the need of a large number of staffs in hospitals and other places in the harsh pandemic situation. Artificial intelligence (AI) and data science played an important role - to identify, track and forecast the outbreak, diagnose and process or even produce drugs by using intelligent systems like, Google's Deep Mind by understanding the virus's protein structure. Besides these, the endless applications of technology include hands-free door openers, automatic hand wash dispensers, UV light assisted sanitizing machines and so on. Moreover, different digital supports used to spread awareness amongst the common people about the pandemic and the primary precautionary measures also helped to restrict the virus spread. In future when we will

look back to these tough days, we will definitely see us learning a lot from the tough situations resulted with various innovative ideas and their implementations to a great extent. For now, it seems to be the darkest time of our lives, but if we think deeply we can realize that over the last few months we have actually discovered our potential and true strength within.

1.21

Technical fighters against pandemic

Debojyoti Biswas, 2nd Year, CST Department, SVIST

A pandemic is a large scale outbreak of an infectious disease with severe morbidity over a wide geographical area and causes major economic and social disruption. Amongst the pandemics, consequences of Severe Acute Respiratory Syndrome (SARS) (2003), influenza spread (2009) and presently the COVID-19 are notable. Aside the support of medicine and biological measures, various technical inventions like, UVD Robots, hands-free door openers etc. have been found to play an inevitable role to combat the present pandemic situation. As shown in the figure above, each robot is a powerful mobile emitter of short wavelength of ultraviolet-C (UV-C) radiation. The emitted radiation is powerful enough to shred off the D.N.A or R.N.A of the microorganisms like, corona virus.

The 'Automatic door opening systems' involves operators and a simple 'wave-to-open' switches. Sensors in wave-to-open switches detect motion and open the door without any touch. Thus prevent the infection transferring germs. The steps like: 1) Planning and coordination, 2) Situation monitoring and assessment, 3) Reducing the spread of disease, 4) Continuity of health care provision and 5) Communication were being taken

to overcome the previous pandemic situation. At present COVID19 will end soon as morbidity and mortality rate decreased.

1.22

Helping hand of technology to fight the pandemic

Abhishek Pandey, (2017-2020 BATCH), CST Department, SVIST.

The common people around the world are trying hard to fight against the COVID-19 pandemic and they are not alone in this battle. The doctors, engineers and scientists all over the world are doing their best possible to tackle the situation. In today's world, in every step of our lives we utterly depend upon the technology. In particular, in the recent past we have clearly seen that how the inevitable boons of the modern science & technology lend a helping hand to fight against the pandemic head-on. Many small and big inventions took place during this pandemic and came quite handy to us to prevent the spread of the disease. One of them is the **Immutouch band,** launched by a Seattle based company (Slightly Robot). The band is programmed to alert the user if they try to touch their face. The accelerometer embedded in the device senses your hand movements. The band buzzes when your hand touches or come closer to any part of your face like, eyes, nose or mouth. The company 'Slightly Robot' was founded in 2015 and they developed a device called **Trichotillomania**. The device was designed to lessen the unhygienic habits of the user like, compulsive skin picking, hair-pulling and nail-biting. In the pandemic situation, the company tapped the designs from Trichotillomania and launched Immutouch in just seven days. Besides this, the other technical supports like, video conferencing apps (like, Google Meet) already in the market have come to their hike in this pandemic situation, helped the educational institutes to continue the transmission of education for their beloved students. Apart from this, the e-commerce digital applications also played an important role in making the tough situation much easier, where people don't need to leave their houses for the things they need.

Humanity has fought the outspread of many fatal diseases in the past like, Influenza, Plague and also the pandemics like, H1N1(1918), H2N2(1957), H3N2(1968) and H1N1pdm09 (2009). Scientists all around the world are trying hard to find a permanent cure for the present pandemic and they will find it very soon. Till then, we just need to be very much cautious, follow precautionary measures properly. Humans are the most intellectual species on the planet and we can fight any pandemic with our sheer will power and intellect.

1.23

Foot operated wash basins

Arghadip Chatterjee, 3rd YEAR, C.E. Department, SRIST

Over the last few months, various efforts have been made to maintain 'social distancing' and still it remains one of the major challenges! Over the tough pandemic days, technology has come out with various innovative ideas like, a weapon for us to fight against the odds and keep our lives going. One of the simplest but effective examples of those is 'foot operated wash basin'. At public places, the hand operated taps may spread the virus when contacted by users. However, the foot operated basins can be easily used without any hand contact, and thus found to be effective to limit the virus spread largely. Basically it is an advanced version of an ordinary wash basin. In this basin nobody needs to touch the tap and instead of that there is a lever at the bottom. The lever is to be pressed with the foot and the water will come out of the tap. Some of the advantages of such wash basins are, (i) one can use this basin without any hand contact, (ii) the structure of the basins are such that they can be easily installed at public places like, hospitals, schools, colleges, offices, shopping malls in a cost effective manner. Due to lack of water resource and extreme use of potable water such touchless mechanism can prevent the spread of the contagion as well as to decrease water consumption in washing of

hands, face, utensils and similar operations. The system is developed in a way that eases its practical applications on the already installed wash basins without the need to replace earlier traditional valves entirely. Very recently, the final year Mechanical Engineering students at Shri Madhwa Vadiraja Institute of Technology and Management (SMVITM), India, designed a 'foot operated wash basin' considering the increase in the spread of the COVID-19. The designed basin can be used in hotels, restaurants, hospitals, schools and colleges. The aim objective of the work remained not to use hands to control the on/off of the water flow, in order to avoid the disease spread. In this machine, the user has to apply pressure on the lever (at the bottom of the machine) using foot. Once the pressure is applied, the water will come out of the tap for use. Thus the direct contact between hands and water tap is avoided. This basin does not involve any electric power to operate and completely made from the mechanical components. Due to which the durability of the machine is longer than the electronic sensor based wash basins. The flow of water can be regulated by the foot itself hence wastage of water is also reduced.

1.24

Contactless cash withdrawal system

Swagata Panda, 3rd Year, C.E. Department, SRIST

Even after a wide span, still we have not fully overcome from the COVID-19! The effective ways to stay safe are, proper sanitization of our hands, surfaces we are prone to touch, substances we use and to maintain social distancing. Over these tough pandemic, the fruits of science and technology have served us every day, every minute. The situation is such that, we need to think twice before we start from our homes, we need to recall if the sanitizer bottle and other necessaries have been taken in our bags or not! Though found cumbersome sometimes, but such habits helped us a lot to stay safe and healthy. A huge number of people use ATM counters for banking. The use of ATM machines bare handed also increases the risk of the virus. So if we can use quick response (QR) code based ATM machines, then it will be safe compared to the use of card based machines. This will certainly eliminate the risks of the virus spread and at

the same time, make the process secure and faster. This will reduce unnecessary contact with the ATM screen. Instead there will be a QR code available on the ATM screen. User has to scan the QR code on his/her smart phone and enter the pin from the phone. Then can collect the cash from the bank account or other banking operations (like, fund transfer from ATM counters, deposit etc.) can be easily done. At some places in India, some banks have already started such card less ATM systems. I think the Government sectors should come forward first to initiate such a technology. This process will not only help us to stay safe from the spread, but at the same time, will be much easier for the older people who sometimes got stuck in complicated ATM procedures.

AT A GLANCE

Other activities of the students, organized by 'Technical e-Magazine Club, SRIST'

- **Activity:** ***"Name & Logo contest" for the magazine*** **(September, 2020)**

- **Activity:** ***"Festive Wishes"*** **(e-poster making & essay writing activities)**
  - ***Kali puja & Diwali wishes (November, 2020)***

  Facebook link for the results:
  https://www.facebook.com/257788825206589/posts/343278056657665/
  - ***Chhath puja wishes (November, 2020)***

  Facebook link for the results:
  https://www.facebook.com/257788825206589/posts/348411026144368/
  - ***Guru Nanak's Birthday wishes & essay writing activity (November, 2020)***

  Facebook link for the results:
  https://www.facebook.com/257788825206589/posts/356682665317204/
  - ***Christmas (December, 2020)***

  https://www.facebook.com/257788825206589/posts/374355510216586/
  - ***New year 2021 wishes (December, 2020)***

  Facebook link for the results:
  https://www.facebook.com/257788825206589/posts/378639126454891/
  - ***Republic Day 2021 (January, 2021)***

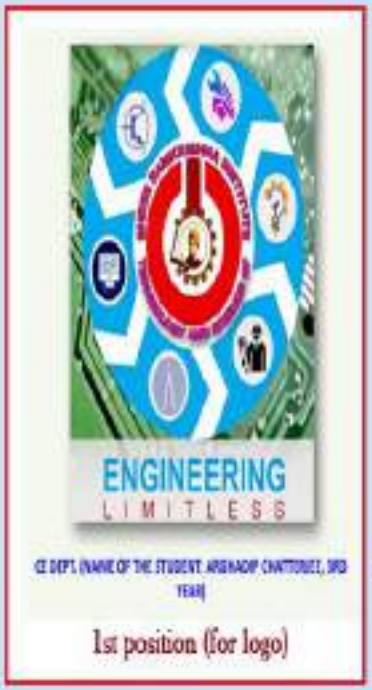
  https://www.facebook.com/257788825206589/posts/394834821501988/

- **Activity:** ***"CALENDER (2021) MAKING ACTIVITY"*** **(December, 2020)**

SHREE RAMKRISHNA INSTITUTE OF SCIENCE & TECHNOLOGY

BEST RESULTS OF THE "NAME & LOGO CONTEST"

Organized by Technical e-Magazine Club, SRIST (SEPTEMBER, 2020)



1st position (for logo)

1st position (for 'Logo')
ARGHADIP CHATTERJEE, 3RD YEAR, CE DEPT., SRIST;
&
1st position (for 'Name')
SAYAN KAR, 3RD YEAR, ETCE DEPT., SRIST.

"FESTIVE WISHES" e-POSTER MAKING AND ESSAY WRITING ACTIVITIES OF OUR STUDENTS

Results of the e-poster making activity on the occasion of 'KALI PUJA & DIWALI'

Results of the e-poster making activity on the occasion of 'CHRISTMAS'

To see the results of the activities of our students in the Technical e-Magazine Club, SRIST, please visit our official Facebook page:
https://www.facebook.com/sristofficial

"FESTIVE WISHES" e-POSTER MAKING AND ESSAY WRITING ACTIVITIES OF OUR STUDENTS

Results of the e-poster making activity on the occasion of 'REPUBLIC DAY'

Results of the e-poster making activity on the occasion of 'SARASWATI PUJA'

To see the results of the activities of our students in the Technical e-Magazine Club, SRIST, please visit our official Facebook page:
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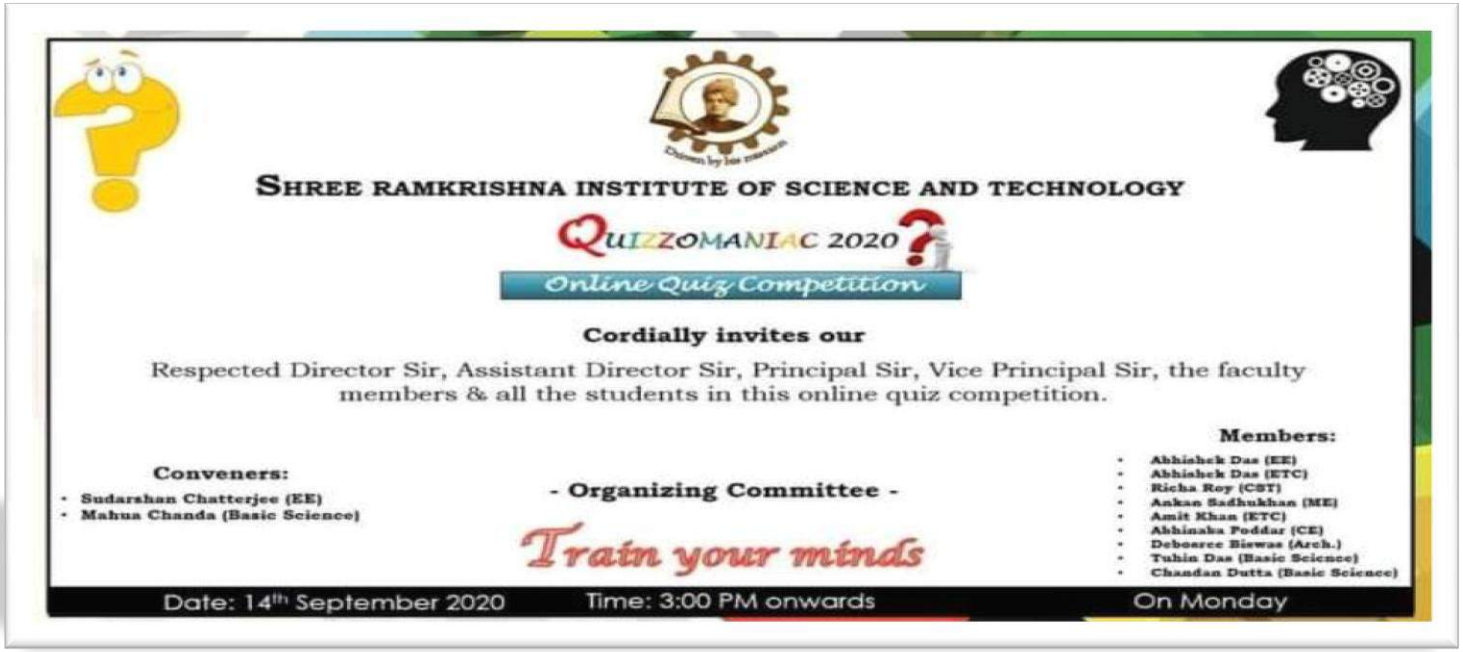
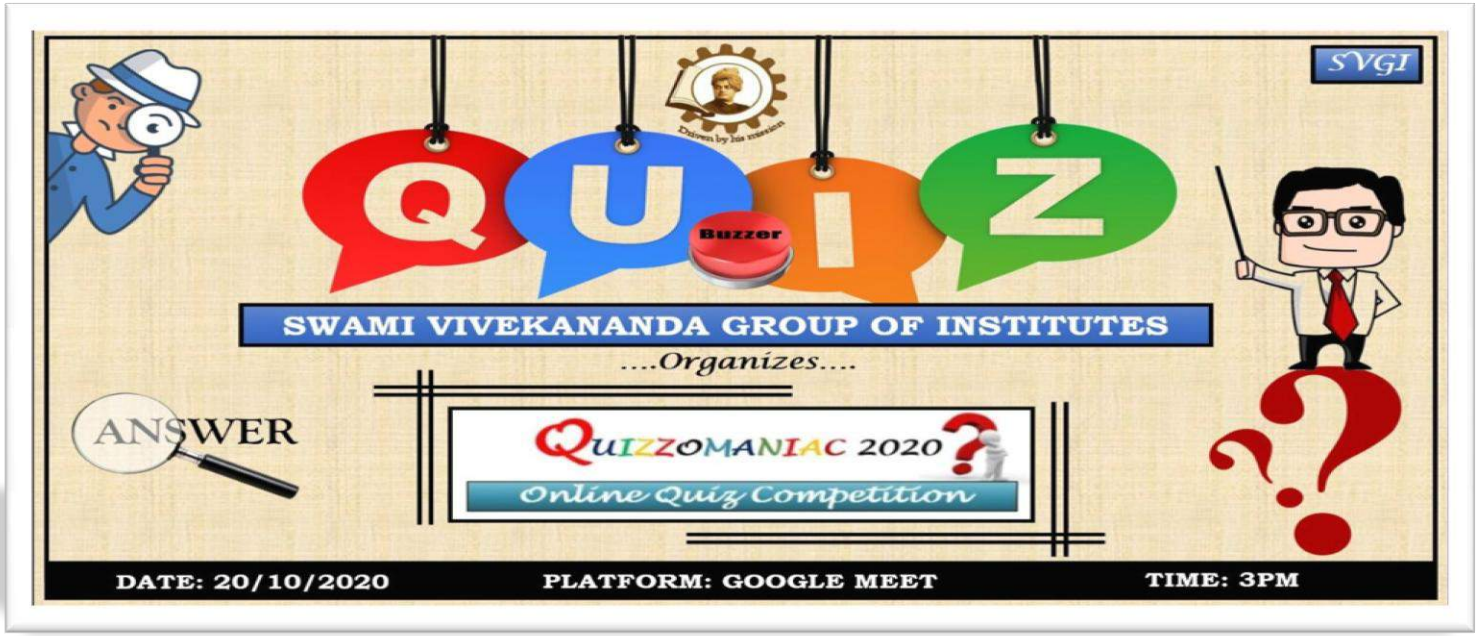
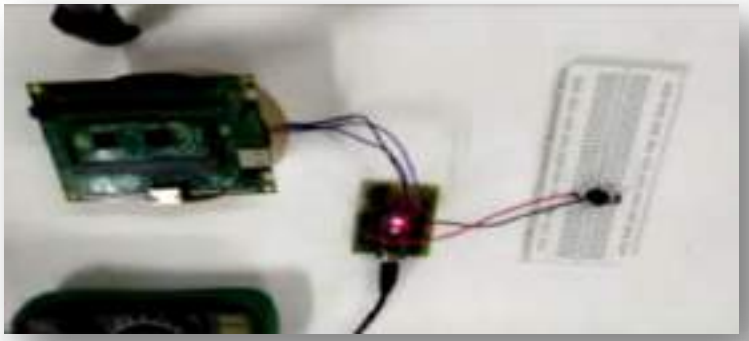
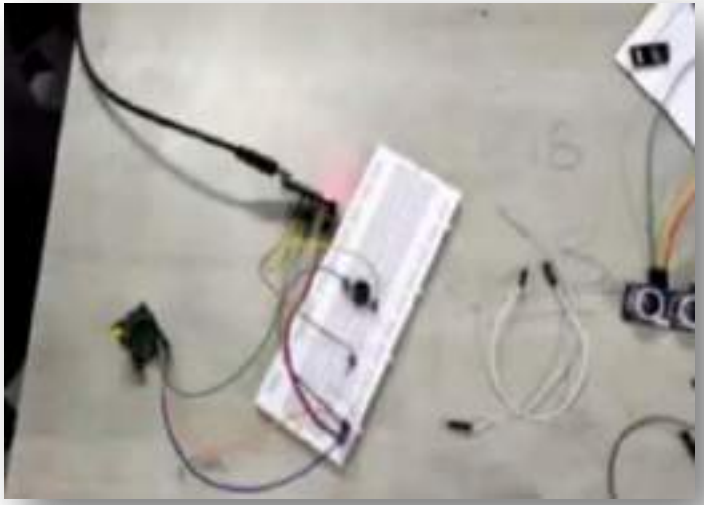

SHREE RAMKRISHNA INSTITUTE OF SCIENCE AND TECHNOLOGY
QUIZZOMANIAC 2020
Online Quiz Competition
Cordially invites our
Respected Director Sir, Assistant Director Sir, Principal Sir, Vice Principal Sir, the faculty members & all the students in this online quiz competition.
Conveners:
Sudarshan Chatterjee (EE)
Mahua Chanda (Basic Science)
- Organizing Committee -
Train your minds
Members:
Abhishek Das (EE)
Abhishek Das (ETC)
Richa Roy (CST)
Ankan Sadhukhan (ME)
Amit Khan (ETC)
Abhinaba Poddar (CE)
Debasree Biswas (Arch.)
Tuhin Das (Basic Science)
Chandan Dutta (Basic Science)
Date: 14th September 2020
Time: 3:00 PM onwards
On Monday


SVGI
QUIZ
Buzzer
SWAMI VIVEKANANDA GROUP OF INSTITUTES
....Organizes....
ANSWER
QUIZZOMANIAC 2020
Online Quiz Competition
DATE: 20/10/2020
PLATFORM: GOOGLE MEET
TIME: 3PM

RECENT HANDS-ON TECHNICAL WORKSHOPS AT SRIST



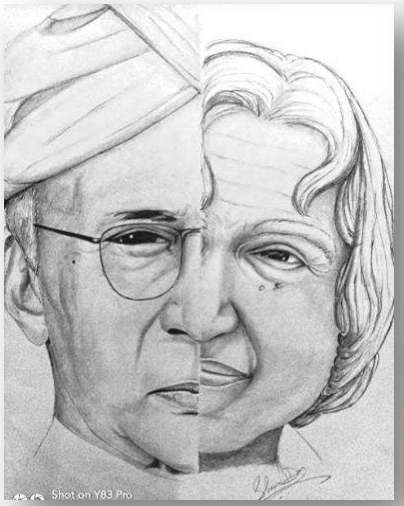


[To watch the Technical Workshop videos, please visit our official facebook page (SRIST)
https://www.facebook.com/sristofficial/photos/a.257793091872829/279139509738187/](https://www.facebook.com/sristofficial/photos/a.257793091872829/279139509738187/)

At a glance

RECENT ACTIVITIES OF THE STUDENTS AT SRIST

RECENT ACTIVITIES OF 'BRILLIANT BRUSHES CLUB' (PAINTING CLUB), SRIST



BRILLIANT BRUSHES CLUB

At a glance (“Diwali”, “Christmas”)

[To see all results of all the activities please visit our official facebook page (SRIST)
https://www.facebook.com/sristofficial/photos/a.257793091872829/279139509738187/]

Recent activities of the students, organized by the 'Cultural club, SRIST'

- ***"Teachers' Day celebration" (on 5th September, 2020).***
- ***"Antakshari" (on 17th October, 2020)***
- ***"Agomonir Sur" (19th October, 2020)***
- ***"Classical song and classical dance on Diwali theme" (21st November, 2020)***
- ***On the occasion of "MERRY CHRISTMAS" & "HAPPY NEW YEAR 2021".***
- ***"SALUTE TO THE HERO" on the occasion of Netaji Subhas Chandra Bose's Birthday.***

To see all results of all the activities please visit our official facebook page (SRIST)
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At a glance

Recent activities for the students, organized by the ***'Photography's club, SRIST'***

ACTIVITY: "SARAT KAL, DURGA PUJA O DIWALI"

To see all results of these activities please visit our official facebook page (SRIST)
https://www.facebook.com/sristofficial/photos/a.257793091872829/2791395097381 87/

At a glance

➢ *Activity: "NATUROTWINNING" & "FLORA & FOUNA"*





To see all results of these activities please visit our official Facebook page
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