SIES Graduate School of Technology
RISE WITH EDUCATION

IEEE MTS SIES GST

SIES GST IEEE

IEEE-SIESGST STUDENT BRANCH PRESENTS

TECHNOZINE 2019

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JOURNEY TO THE MOON

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ABOUT SIES GST

The South Indian Education Society (SIES) was established in the year 1932. It is a pioneer in the field of education, knowledge and learning in this metropolis. The Society has been serving the cause of education and has carved for itself a niche, as a provider of quality and value based education from Nursery to Doctoral level in a wide variety of fields. The institute seeks to achieve the educational mission by focusing on the modes of inquiry, which strengthens thinking skills and provides extensive field experiences, to bring together theory and practices.

"This society should sincerely serve the cause of education and the educational needs of the common man of this cosmopolitan city"

- SIES MISSION

(set by our founder Shri M.V.Venkateshwaran in 1932)

"To be a centre of excellence in Education and Technology committed towards Socio-Economic advancement of the country"

- SIES VISION

SIES Graduate School of Technology, an integral part of the well-established South Indian Education Society was founded in the year 2002. It is a part of an ever-growing educational hub in Navi Mumbai, imparting quality based technical education, offering four-year Bachelor of Engineering courses in Electronics and Telecommunication Engineering, Computer Engineering, Information Technology, Printing & Packaging Technology and Mechanical Engineering. SIES GST has been well known in terms of producing quality and quantity. It stands to be a prestigious institution with a rich set of qualified faculties who have always been there to serve the young growing minds. SIES GST aims to enlighten its students and bring the best out of them.

SIES GST is now NAAC Accredited successfully.

SIES
Graduate School of Technology
RISE WITH EDUCATION

SIESGST EXTC DEPARTMENT VISION

To be a Premier Department in Electronics & Telecommunications Engineering.

MISSION

1. To provide quality education satisfying the requirements of the corporate world across diverse fields.
2. To develop life-long learning skills to cater to socio-economic needs.
3. To strengthen Industry-Institute Interaction to bridge the gap between academic and industrial requirements.
4. To equip students with leadership and entrepreneurial skills.

PROGRAM EDUCATIONAL OBJECTIVES *(PEOs)*

Graduates will be able to:

1. Identify, formulate and solve engineering problems in the Industry, complying with ethical standards and societal needs.
2. Pursue higher studies and professional development courses leading to significant advancement in the field of specialization.
3. Apply technical concepts to develop applications and design products.
4. Exhibit leadership and entrepreneurial acumen in career.

ABOUT IEEE SIES GST

The IEEE student branch was established in the year 2006 in SIES GST. Ever since, it has seen a vast growth in the quality of the student branch as well as the intellectual growth of its students. It is one of the oldest student bodies of SIES GST which has been very active over the years in organizing various extracurricular activities, events, fest, and workshops.

"It is a great platform to build technical skills"
"We don't see things as they are, we see them as we are".
- IEEE SIES GST ALUMNI

We aim to imbibe the latest technological advancement and knowledge in the young growing minds by organizing innovative workshops and events for all its students. Some of the various workshops organized under the student branch are drone workshop, Arduino workshop, ML workshop, FPGA workshop and many more. IEEE SIES GST proudly presents its annual technical festival 'TECHOPEDIA' every year. In order to grab the attention and encourage the students to build on their technical knowledge, the student branch organizes three national-level events under the fest. They are INQUISITIVE (National level quiz competition), SQUABBLE (National le el debate competition), TECHNOPOLY (competition for testing the student's basic electro ic knowledge) and GOT ANY IDEA (National level poster making competition). This major event sees active participants from within the college and many more students from colleges across Mumbai and Navi Mumbai. The winners of each event are encouraged with cash prizes, certificates, and medals as a token of appreciation. We as a student branch also focus on building the student's knowledge on the current developments and advancements by organizing various seminars, lectures, and guest lectures. The speakers for each of these events are a set of well-qualified faculties from various colleges and experts from industry. We can proudly say that many of our own students have conducted many seminars successfully in recent times. Apart from increasing the student's academic excellence, IEEE SIES GST also takes its students on Industrial visits to give them exposure and learning about the many evolutions taking place in the outside world industry. As a whole IEEE has helped in carving out various young peers not only in the field of technology but also in leadership. Year by year the student branch has seen active participation and increase in interests in all its ventures which has increased the morale of IEEE SIES GST by leaps and bounds. IEEE SIES GST would like to thank our honorable I/C Principal Dr. Atul Kemkar, respected HOD Dr. Preeti Hemnani, Branch counselor Prof. Biju Balakrishnan and last but not the least, the entire student council whose culmination of efforts has helped in the progress of IEEE SIES GST.

COMMITTEE

ABHISHEK SINGH
CHAIRPERSON

SAKIB PARKAR
MTT-S CHAIRPERSON

AADITYANAND
IEEE REPRESENTATIVE

ASHISH SAHU
PROF. BODY REP.

SAHIL PANDITA
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MEGHA V. R
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CREATIVE HEAD

ATHARVA KARNIK
DESIGN HEAD

ADITYA BIRAJDAR
DESIGN HEAD

SHUBHADA PHALKE
ADMIN HEAD

SACHIN MISHRA
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WIE REP.

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M.D.O.

NIJA MANOMOHAN
HOSPITALIT HEAD

MITALEE PALWE
M.D.O.

onics and Telecommunication

FROM OUR BRANCH COUNSELOR

It is an honor for me to present the 4th edition of the annual technical magazine **'TECHNOZINE'** of our very own IEEE student branch.

I am indeed honored to hold the post of the IEEE branch counselor in SIES GST and I aim to encourage the young growing minds of our college by igniting the spark in them. The student branch has indeed made me proud with the smooth functioning of the Executive Committee by organizing various events that would not have been possible without their cooperation and efforts.

'TECHNOZINE' is a log-book showcasing the cumulative effort of the entire IEEE team and the minds who have worked behind the success of all events that have been conducted throughout this year. It also includes a plethora of technical articles written by our own students. I am very glad the Microwave Theory and Techniques Society (MTT-s) is putting efforts to organize quality programs.

None of this would have been possible without the support of our respected Advisor **Dr. P. V. Parameswaran**, in charge principal **Dr. Atul Kemkar** and our HOD **Dr. Preeti Hemnani**. I extend my warm regards and thanks to them. I would also like to thank and appreciate the team of **IEEE SIES GST** and the ones behind **'TECHNOZINE'**. I wish success to each one of you for all your future endeavors.

- Prof. Biju Balakrishnan
IEEE Branch Counselor and MTTS Advisor

WORDS BY CHAIRPERSON

IEEE, the one platform to learn, gain knowledge, improve your skills and show professionalism. This one stage for all has made an impactful and drastic change in my college life and skill set development.

Right from my journey as a marketing volunteer in my second year to being a technical head in my third year and finally being elected as the chairperson of IEEE SIES GST, this Student Branch turned family has always been very close to my heart. Leadership and perseverance are reflected in each of them working under IEEE. Practicing and implementing team ethics and value-based discussions and executions is what I always wanted to focus on. Leading and taking forward this team involved facing various challenges but were eventually overcome by the excitement and productivity that comes to you when you along with your team can make things happen the right way and achieve ultimate success. IEEE SIES GST has organized various workshops, seminars and guest lectures as a student body under IEEE Bombay sections support, many at times having speakers from them. Alongside we have organized various industrial visits and conferences for the IEEE members in order to build our network. I can proudly say that we organized and published the successful event 'Techopedia 8' with two new events known as 'Technopoly' and 'Got Any Idea' during my very tenure. It was overwhelming to see the cumulative efforts of all my team members who worked hard day and night to think and execute their various creative ideas in order to set the benchmark high and reflect this mass event as a result. With every passing year, IEEE SIES GST has worked towards serving as an open platform to Explore and develop your skills as well as intellect in various possible fields, be it technical or in management. It has always helped one to learn how to manage this extra-curricular passion along with the academics that are to be done. I personally have had a wonderful journey working with my peers getting to learn as well as showcase the very different skills around. It was always a pride to be the chairperson of the IEEE Student Branch of my college. Needless to say, about the experience and knowledge I have gained, the best I could get in return was my IEEE family. Some memories and proud moments are for me to cherish always.

Abhishek Singh
Chairperson, IEEE SIES GST

OUR MTT-S CHAIRPERSON

The one and only 'IEEE SIES GST', has been a part of me ever since it grabbed my attention way before I started my student life in this college as a direct diploma student.
It gives me immense happiness to have come across a bunch of extremely talented and helpful seniors, under whom I could work with a lot of ease and at the same time showcase my love and dedication for the student branch.
My journey started from holding the post of the Co-Treasurer in 2018-19, to gradually rising up to eventually becoming the MTT-S Chairperson. It is a huge dream come true, yet proud moment to have had this beautiful journey filled with a lot of passion and professionalism, with this team.

MTT-S was the very first chapter that was started under IEEE SIES GST.
Being elected as the first Chairperson of this sub-chapter is definitely one of the most special things that have happened to me so far, and will always be notable for me. Oh yes!, I was very anxious in the beginning as it was my responsibility to nurture this very new addition and bring out the best in it with all my efforts. However, I took this as a challenge went forward with the aim of reflecting all the possible benefits of MTT-S in order to grab the interest of the fellow students in the college. Of course, I have to mention our branch counselor, Prof. Biju Balakrishnan Sir who has always been a constant pillar of strength and guidance for all the endeavors of this team.
We decided to start off on a small scale and pace up gradually to go on and expand the sub-chapter as it was our very first stepping stone. Nevertheless, we were successful in gathering up to 20 MTT-S members in our very first attempt itself.

IEEE SIESGST and MTT-S have played a major role in these 3 years of my college life. It has taught me the smallest of the things from management and balancing my academics. This platform was truly the best for me to explore, learn and execute. I would like to thank and appreciate each one of them who were there along with me throughout this wonderful voyage. Something that I have earned the most would be my IEEE Family with whom are some of the finest and gratified moments for me to always remember and cherish.

- Sakib Parkar
MTT-s Chairperson,
IEEE SIES GST

REPRESENTATIVE'S DESK

Are you an engineering student too? If yes, then what is it that you are looking forward to in the next four years of your engineering life; that is if you make it through?
Well, for me it was without a doubt the IEEE student branch.
To be honest, I've never felt like it was something very official like a student body that could be any sort of pressure, rather it was more of a belonging feeling that I had like that of a family and I could feel it since the day I stepped in. I have been associated with the student body since the last two years, and I must say that there are innumerable things that I have learned and each day has added making it a remarkable journey.
I still remember when it all started; I had joined in as the technical head in the 3rd year, and with time, stepping into my final year of college, I was designated for the position of IEEE's representative and the rest is history. It has been a learning experience in not just the technical but management field as well. We have worked by creating and organizing different events around the year, thinking of workarounds wherever necessary. Also while working for the student branch, we had a lot of opportunities in the innovation sector, and I am very happy and proud of how we came up with some unique ideas for the events. As a representative, I have worked for the smooth flow of the student branch, keeping in mind several factors that could affect growth while taking some risks as well.

While working for IEEE, I met different people, not just students but professionals in different fields too. The experience they have had was immense, and one would definitely like to take inspiration from their amazing work. Our professors guided us throughout the journey and played a very supportive and important role in helping us become, what we are today.

To conclude, I would say that IEEE made me what I am, helped me shape as a person and I take pride in believing that I am someone who can balance both technical and management aspects with a calm and stable mind. This is exactly what I had in my mind thinking of good college life and was wanting from these precious four years of engineering and here I am today.

-Adityanand
IEEE Representative, IEEE SIES GST

MOON TO MARS

Why limit the boundaries of human exploration?
When "WE" can push it forward to the Moon and to Mars as well.
Missions to the MOON are about 1,000 times farther from Earth than missions to the International Space Station, requiring systems that can reliably operate far from home, support the needs of human life, and still be light enough to launch. These technologies will become increasingly more important for the 34 million mile trip to MARS.

WHAT'S DIFFERENT?

More than 45 years since we last set foot on the Moon, now it has renewed the nation's focus on expanding humanity's presence beyond Earth. Space Policy Directive-1 provides the direction for NASA to organize more effectively government, commercial and international efforts to develop a permanent presence off Earth that generates new markets and opportunities, both scientific and economic. HOW?

ORION SPACECRAFT.

Orion will take us further than we've gone before, and dock with the Gateway in orbit around the Moon. It is designed to support astronauts traveling hundreds of thousands of miles from home, where getting back to Earth takes hours rather than days. Which saves a whole lot of time.

WHAT IS ARTEMIS?

She was the twin sister of Apollo and the goddess of the Moon in Greek mythology. Now, she personifies our path to the Moon as the name of NASA's program to return astronauts to the lunar surface by 2024, including the first woman and the next man. When they land, our American astronauts will step foot where no human has ever been before: the Moon's the South Pole. With our goal of sending humans to Mars, Artemis is the first step to begin this next era of exploration.

WHAT'S IN THERE FOR US?

NASA, in collaboration with the NSGF, is giving university teams the opportunity to develop innovative design ideas that will assist NASA's Moon to Mars mission objectives. This collaborative opportunity provides real-world, hands-on design, research and development opportunities for university students interested in any careers while strengthening NASA's efforts to optimize technology investments, foster innovation and facilitate technology infusion The 2021 Moon to Mars eXploration Systems and Habitation (M2M X-Hab) Academic Innovation Challenge is an opportunity for NASA to build partnerships and tap into the ingenuity and creativity of the rising Artemis generation space explorers. It includes areas like Habitation Systems, Vehicle Systems, Robotic Precursor Activities, Human Spaceflight Architecture Systems (Gateway-focused), etc. Our unique minds can make the journey to the MOON TO MARS the most successful one.

- Shreya Gode
FE EXTC

FAILED LUNAR MISSIONS

Space is not an easy terrain to conquer. The lunar surface lays polluted with failed attempts... In the period from 1958 to 2019, India, the USA, Russia, Japan, European Union, China, and Israel, have all launched different lunar missions and not all of them had happy endings.

The following are a few of the notable failed attempts to reach the moon:

• The first mission to the moon, planned by the US in 1958, Pioneer 0 was unsuccessful since the spacecraft's booster rocket blew up seconds after the launch.

• Luna-1, Luna 2 and Luna 3 were the only successful lunar missions launched by the USSR out of the 14 missions that failed due to launch failures.

• The Ranger program was a series of unmanned space missions by the United States in 1960. This was successful in its 7th attempt and was able to take close-up pictures of the moon.

• Luna 4 to Luna 8 also had spacecraft failures and then next successful one was Luna 9 which had the first lunar soft landing

• Apollo 1's launch pad caught fire, killing an entire crew of 3. Apollo 13 was another unsuccessful lunar mission due to an oxygen tank explosion.

• Israel's Beresheet, the world's first private moon mission ended in failure. An ill-timed technical glitch prevented the Bed Sheet from slowing down during its descent. It transmitted one last photo 14 miles above the lunar surface.

• India's Chandrayaan-2, had less than 2 miles to make history when the Vikram lander lost control and crashed onto the surface. The impact of the crash damaged the machinery onboard and the lander was out of communication. Chandrayaan-2 failed to land on the moon, but it sure did win the hearts of us Indians

All these failed attempts did not stop the space agencies from achieving their goal. They kept trying until they were finally able to reach the Moon.

-Anushka Tawte
FE CE

IS AI THE NEW GATEKEEPER OF THE COSMIC SYSTEM?

Several years after the first moon landing, experts are now looking at emerging technologies to understand space exploration a little better. With recent breakthroughs and discoveries, AI has been showing immense potential in space exploration, such as global navigation, earth observation, and communications to and fro.

Historically, machine learning algorithms have been used in monitoring the spacecraft, autonomous navigation of the spacecraft, controlling systems, and intelligently detecting objects in the route. And now, in a bid to help astronauts, AI-based assistants are being created to aid astronauts in their missions to Mars and beyond. These assistants are designed to understand and predict the requirements of the crew and comprehend astronauts' emotions and their mental health.

Distinct advantages in Space Exploration:

AI has positioned itself as a game-changer, even for the space industry. The governments and agencies have been leveraging AI technologies, for a long time, to gather imaging data related to space exploration. Robotics is also seen to be used by government agencies to conduct modern surveillance, identify and mitigate risks, and also to analyze the substantial amount of collected data. According to the European Space Agency (ESA), satellites can produce over 150 terabytes of data per day. With the use of AI technologies, one can reduce the mission costs, extend battery life, and can analyze a vast amount of imaging data produced by the satellites. Earth Observer 1 (EO-1) satellite, SKICAT, ENVISAT are a few of the satellite examples around that use AI to provide actionable insights for agencies, governments, and businesses, and help them in making accurate decisions. Another critical utilization of AI in the space business is the dynamic range use, which is a procedure of expanding the range proficiency of the availability through continuous modifications. On account of room investigation, while satellites can figure out how to transmit information utilizing the fitting frequencies, profound learning innovation can streamline this correspondence. According to a report, the technology used for RLAN can be enhanced to lower the chance of interference and increase spectral efficiency. These technologies also help in the telemetry and control of geostationary orbit and non-geostationary orbit's frequency and physical coordination. Deep learning technologies are not only reducing the interference burden for satellite networks but also avoiding co-channel interference at different stages of the satellite orbit.

Space Exploration with AI

To explore space travel effectively, NASA is consistently making progress towards AI applications. In 2018, NASA awarded $330,000 as a research grant to a team to develop an AI to guide the ships in space amid the debris. This auto-

nomous navigation used Ethereum blockchain technology to create a "decentralized, secure, and cognitive networking, and computing infrastructure for deep space exploration." Alongside, NASA has developed an AI upgrade — AEGIS (Autonomous Exploration for Gathering Increased Science), which helped in automating the laser-firing capabilities of the rover. With an increased pace in data collection, a trained AI system is a perfect match to monitor the spacecraft as well as reduce the downtime and possible risks. The partner between NASA Frontier Development Lab (FDL) and Intel, in 2018, also provided directions to astronauts in space. In this program, NASA appointed a few researchers to develop an AI system that will simulate the moon's surface and then compare the same with the local environment. The AI would be trained with millions of moon images and then would use a neural network to create a virtual moon. With the help of Google's trained model, NASA also managed to discover two obscure planets — Kepler-90i and Kepler-80g. Aside from NASA, that year, European aviation organization — Airbus had likewise presented AI in space investigation. AI-powered 3D printed spherical robots — Crew Interactive Mobile Companion (CIMON) was being developed to help astronauts with their everyday tasks at the International Space Station with the empathy level of a human. A second version of the technology, with extended capabilities and functionalities, is also in process, known as CIMON-2. Apart from CIMON, Robonaut, Valkyrie, RoboSimian from NASA; Kirobo from Japan Aerospace Exploration Agency; Dextre from Canadian Space Agency; and AILA from German Research Center for Artificial Intelligence are a few of the humanoids developed by NASA and other space agencies to help astronauts in the space. Another significant example is the Japanese Space Agency, which has developed an intelligent system — JAXA's Int-Ball, for the ISS, to take images of experiments in the Japanese module. This autonomous, self-propelled, and maneuverable ball camera used existing drone technology and was developed to help astronauts with on-board problems and exploration missions.

Space Race - The Beginning Throughout the most recent 20 years, these billion-dollar organizations made considerable progress by utilizing man-made reasoning in their space investigation. And, in more recent years, they have taken bold steps towards their goals. So, with such huge developments and involvement of artificial intelligence in space, it is difficult to say who will be the first, among the billionaires, to crack the AI market and take the lead in this space race. Albeit, as different uses of AI, nothing can be concrete and secure with AI; be that as it may, the innovation of computerized reasoning is indicating clear potential in investigating the interstellar space with innovative machines and projects. With each innovation, technology is coming closer to providing newer insights and proving to be an advantage for humans. Humanoids and other machine innovations with artificial intelligence are propelling the space industry, which means the future is exciting, and the potential is immense.

-Prathamesh Thakur
SE EXTC

SpaceX: #dearMoon!!

Space Exploration Technologies Corp. also is known as SpaceX is a well known private American Aerospace Manufacturer and space transformation service company based in California owned by Elon Musk. What makes this company different from others? Let's check some of the facts:

- Dragon Capsule: In 2012, SpaceX launched a craft that circled the globe, a Dragon capsule that circled the world twice and parachuted back into the Pacific Ocean.
- Budget Cuts: Most of the projects they work on are one-third of the budget that NASA would have put into this. This is a surprising fact and the company is very proud of its efficiency.
- Naming the craft: The company tries to come up with catchy popular names that people would relate to.
- Team Microsoft: Microsoft and SpaceX started a joint project to create the largest aircraft ever. The project is set to be launched in 2020.
- Musk's ultimate goal: His biggest and dreamiest project is sending people to Mars as little for $500,000!!

dearMoon Project

"I choose to go to the moon, with artists – Yusaku Maezawa."

#dearMoon Project is a lunar tourism mission and it is financed Japanese tycoon Yusaku Maezawa. This project will feature the Starship and will be a single circumlunar trajectory around the Moon. This amazing project was unveiled in 2018 and has been trending since. The project is expected to start in 2023.

This project was planned to launch with much smaller craft the Dragon2 with the help of launch vehicle Falcon Heavy, which would have carried only 2 passengers. Later on, they decided on a bigger craft, The Starship. Starship is still in development and will be thoroughly tested along with uncrewed circumlunar test flight. This flight will take 6 days to complete. There will be 6 to 7 well-known artists accompanied by Maezawa and 2 crew members. Even though this mission looks too ambitious, SpaceX is determined to achieve this ultimate goal.

This project is meant to restore humanity with the help of various artists like painters, musicians, fashion designers. They will inspire art with this experience and later display it to everyone after their return. This project is meant to inspire the dreamer within us with the help of these artists. #dearMoon is a revolutionary space tourism project of the 21 st century and one of a kind. This project not only encourages space tourism but also a fine opportunity for aspiring astronauts to know about space more. A similar project is being planned for Mars and it's mesmerizing. Our vision is to know about our #dearMoon and space beyond that.

- Shruti Singh
FE EXTC

MOON IS JUST FEW STEPS AWAY

The moon has always been a fascinating topic for all of us humans. We've come a long way, from viewing the moon with a telescope to actually walking on the surface of our cosmic partner. 2019 marked the 50th Anniversary of NASA's Apollo 11's successful landing of humans on the moon. In all, six missions landed men on the Moon, beginning with Apollo 11 in July 1969 in which Neil Armstrong became the first man to walk on the It's only fair to wonder: When are we going back? Here are some of the future Lunar Missions that might spark your interest:

NASA's Artemis:

By 2024 NASA is committed to landing American astronauts, including the first woman and the next man on the Moon. This would be the first time that people have walked on the moon since the crew of Apollo 17, in December 1972. (humans have been back to the moon since Apollo 17 in 1972. NASA is planning to launch Artemis I, a crewless flight to test the new rocket, SLS (Space Launch System) and the Orion spacecraft together, followed by the Artemis II mission, the first rocket and Orion test flight with crew. NASA will land astronauts on the Moon by 2024 on the Artemis III mission and about once a year thereafter. Chinese Lunar Exploration program: Missions namely Chang'e 6,7 and 8 are planned to launch between 2023 and 2027. The first, Chang'e 6, will investigate the topography, composition and surface conditions of the proposed site. Chang'e 7, set to launch shortly after will explore the south pole. Then Change'8 will then attempt to print a 3D structure using the on-site resources. These missions will also have lunar rovers that will help in the study of the moon.

Chandrayaan-3:

Following the failure of Chandrayaan-2, India will again try to land on the moon. Chandrayaan-3 mission is going to be a collaboration between Japan's JAXA space agency and the Indian Space Research Organization (ISRO) and would deploy both a lunar rover and lander to aid further exploration. As per reports, ISRO has already started designing the mission and the launch could be scheduled anytime around November of this month.

All these missions will make sure that the coming years will not have a shortage of excitement for the next generation of space explorers. We can finally walk on the moon which is something that we have been looking up to since our birth. The goal to get to the moon has been accomplished, so what's next? The journey to Mars?

-Sanskruti Wathare
FE CE

YOURS TRULY, THE MOON!

Respected Madam/Sir,
Team 17th was celebrating. It seems they pulled off the feat in record time, I could see that. Kudos! Compared to your previous tries this one was considerably good. Thank god you did modify your vehicle as this time you could enjoy my hospitality for a good time.

I still remember your eighth, successful one it was! The one where you entered from my back. I could see you circling me but boom I wasn't expecting your vehicle over me. That was my first revelation to you guys. The ninth was I could say testing the waters again, was it? Oh no, you did videotape me this time if I am not wrong. And the 10th one was a very planned one. Your vehicle descended in my module to an altitude of less than 47,000 human feet above my body and took many photographs.

Finally your eleventh one, you were walking on me. I could see you humans carrying out a sequence of activities that included some Solar experiment, collection of a larger sample of my material. Just out of curiosity, what did you do with my collected samples? Approximately two and a quarter human hours after descending to my surface, the humans began preparations to exit. Your 12th mission was just a modification to your 11th it seemed. Your research on me could be seen. What happened on the 13th, I could see your vehicle but you didn't land, why? And also I did hear an explosion. The 14th and 15th were successful too. The 15th one brought some other vehicle too with the Humans. (Lunar Roving Vehicle) Your 16th entered my new region unknown to you, I could see your confusion. You seem to be comfortable with me by now. The humans from 16th one walked past different regions of my body and collected a lot of my parts too! Now comes the 17th, it was a very smooth landing and needless to say you are enjoying your stay over me...
Just don't harm me, I am scared of what you did to Earth!
According to my sources, I should expect some guests again now should I?
My dear humans, a strategic time out is what I need now the most!
I hope this letter reaches you before your mission.
Sent time: 2000 human years.

P.s - please send my best photos and videos as soon as possible.

Yours in satisfaction,
Moon.

- Vaishnavi Sreekumar
SE EXTC

AISYWC 19

IEEE India Council and IEEE Hyderabad Section conducted a three-day program called All India Student Young Professional and Women in Engineering Congress 2019(AISYWC'19) from 28th-30th September 2019 at CMR Group of Institution, Hyderabad.

IEEE Hyderabad Section is one of the biggest sections in terms of student members as well as the geographic region which is spread over Madhya Pradesh, Goa, Chhattisgarh, and Maharashtra. Section Congress, a collaborative and engaging gathering was organized at the CMR Group of Institution, Hyderabad, to strengthen the relation between all the IEEE Volunteers and Student Members. It was a collaborative and egaging gathering which motivated them to guide their career. This event was organized to make the inner and hidden Student Volunteers from different regions to come up with their idea to make them feel free to network with different students.

All India Student, Young Professional and Women in Engineering Congress (AISYWC) is a pan India congress hosted every year by one IEEE section to bring and enable IEEE members from various walks of life to step onto one common platform.

IEEE XTREME 13.0

A worldwide coding competition was conducted under the IEEE organization called "**IEEE XTREME**" on 19th October 2019 from 5.30 am, Saturday to 5:30 am IST Sunday. It's a 24-hour coding competition, in which the students of SIES GST participated.

IEEE Xtreme is a global challenge in which teams of IEEE Student members, advised and proctored by an IEEE member, and often supported by an IEEE Student Branch compete in a 24-hour time span against each other to solve a set of programming problems. Six teams from SIES GST participated in this competition, where they were given set of questions of increasing difficulty every 2 hours of varying logic and algorithms to be solved using math, graphs, dynamic programming, brute-force, static programming, Game theory and other commonly used tags using any language of comfort. This meant tireless and problem-solving coding without any major breaks for the 24-hour time period.

The team named '**ShadowCoders**' secured the top 800th rank in the worldwide competition.

All the teams gained a lot of valuable experience in the field of competitive programming as the contest came to an exciting end at 5:30 AM in the morning.

IMaRC 2019

The IEEE Microwave Theory and Techniques Society (MTT-S), with technical co-sponsorship from **IEEE Bombay Section** and IIT Bombay, organized the 2019 **IEEE MTT-S International Microwave and RF Conference** (IMaRC) during December 13-15, 2019 at IIT Bombay, Mumbai, India.

This conference is held annually in India and provides a forum for the international community of microwave engineers to meet and present their latest technical achievements in the field of microwave and RF components, circuits, systems, and modeling techniques. The Student Travel Program (STP) helped 2 students of SIES Graduate School of Technology, Nerul to attend this conference. STP is a program that provides students with sponsorship for attending the conference.

IMaRC 2019 required many volunteers for organizing this conference. Sachin Mishra of SIES GST volunteered at the conference.

IEEE DAY

IEEE SIES GST organized a celebratory program on the account of "IEEE Day", on Monday, 14th October 2019 between 4:30 pm to 5:30 pm at SIES Graduate School of Technology, Nerul. The chief guest for this program was Dr. Vinit Kotak, Vice-Chairperson of the IEEE Bombay Section. He is a Professor and the Vice Principal at Shah and Anchor Kutchi College of Engineering, Chembur. His field of interest and expertise includes Radio Frequency Identification, Networking, and Internet of Things (IoT). The program started with the welcoming of the chief guest, branch counselor and all the faculty members present. The hosts for the event were Prathamesh Thakur and Swapnil Vishwakarma, IEEE members of SIES GST. Then Mr. Abhishek Singh, Chairperson of IEEE SIES GST, welcomed everyone and spoke about his experience as an IEEE member, the workshops and seminars conducted by IEEE SIES GST and the extent to which IEEE has grown in our institution. After this, Dr. Vinit Kotak shared a few words regarding how far IEEE has come over the years, opportunities and advantages offered by IEEE, the development of IEEE SIES GST and their strong code of ethics. His speech ended with a word of thanks and wishes to all the members of IEEE SIES GST.

Later, a quiz competition was organized, where technical questions were asked to the members and goodies were awarded for the right answers. The quizmaster for this competition was Harsh Agrawal, Technical Head of IEEE SIES GST. This was followed by cake cutting and group photo sessions. Around 80 students attended this program. The concluding remarks were given by Poorva Chaudhary, member of IEEE SIES GST. She appreciated the efforts of the hosts.
The program ended with gratuity to the guest and the vote of thanks.

MTT-S INAUGURATION

MTT-S sub-chapter of **IEEE SIES GST** was officially inaugurated by **Dr. Aswhwini Kotra Shetty** on 3rd April 2019. A seminar cum guest lecture for the students of IEEE was organized by MTT-S chapter on the same day.

The seminar is useful for the selection and scope of antennas in BE projects.
The seminar contents are:
1) Prerequisite of Antennas
2) Advancements in antennas
3) 4G antennas
4) Massive MIMO antennas for 5G
5) Challenges in antenna design

The Guest lecture by Dr. Ashwini Kotra Shetty from Don Bosco Institute of Technology, on ARWP (Antenna Radio Wave Propagation), Sem. VI Subject of Electronics and Telecommunication engineering was arranged on 3 rd April 2019. She explained the importance of antennas in communication engineering. Antennas are the heart of wireless communication systems, without which, wireless communication cannot exist. She also discussed the career opportunities available in the field of RF, microwave and antenna domain and motivated students to do their career in these domains. She has discussed the various advanced antennas used in recent communication technologies. The different antennas used in mobile phones such as antennas for Bluetooth, data and Wi-fi applications were discussed. Also, cell phone tower antennas were discussed. She explained MIMO and massive MIMO antenna technology in brief. The challenges in the designing of the MIMO antenna required in 4G mobile communication are also discussed. The different diversity techniques based on MIMO antenna systems were discussed. A total of about 70 students attended the lecture. The speaker addressed the queries of the students and the lecture was very fruitful to the students.

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TECHOPEDIA 2019

IEEE Student Branch of SIES Graduate School of Technology organized the 8th Edition of TECHOPEDIA. **Techopedia** is a national level technical festival organized under the IEEE Student Branch of SIES GST. It included 4 events, namely Inquisitive (National Level Quiz), Squabble (Debate), Got Any Idea (Poster Presentation) & our flagship event Technopoly (Mini Hack-a-thon). For the first time, we had a theme for our fest i.e. **JOURNEY TO THE MOON**.

The motive of this Tech Fest was to develop various skills of students in Co-Curricular activities and to expose them to the current trends in the technical and professional fields. There was a great response from the students of our college and from other colleges all over the city. The feedback that we have received from the participants was very positive and appreciative.

TECHOPEDIA was one such small world created by our very own IEEE team!

Work done by Creative Team:

Events held during Techopedia 2019:

SQUABBLE:

A national level debate, is an event where one can explore their ability to speak, convince and engage in thought provoking topics over three rounds. This event is played with team of two, participating to compete with other teams to be the best.

Winners of SQUABBLE:

1st Prize: Arman & Usama

2nd Prize: Harshita Shrivastav & Shreyasi Gode

INQUISITIVE:

A veritable national level quiz competition where the students can test & unveil their knowledge beyond limits; so as to see where they stand in this world of Technology. This event is played in teams of 2 people, wherein the collective thinking and display of knowledge reflects one's srength while competing with the rest.

Winners of INQUISITIVE:

1st Prize: Amogh Gokhale & Siddheshwar Nadar

2nd Prize: Siddhi Thorat & Nishchay Verma

Got Any Idea?

GAI? is a team event where a team consists of three members and together they have to think about a project on women development and they have to prepare a poster for the same. For the next round there will be a presentation on how the project will be implemented.

Winners of Got Any Idea?:

1st Prize: Aditi Sawant, Arfah Upade and S. Ananthaselvi

2nd Prize: Rohan Shind, Srishti Patil and Nija

TECHNOPOLY:

A national level project making competition, where participants can test their technical creativity and ability to brainstorm ideas to make a working model project, out of some components(eg: sensors,resistors etc) which will be provided to them on the lines of the most common MONOPOLY game. They will be judged on how smartly they put together the least and most effective components to showcase their technical perspective. They will participate in groups of 2 or 3 competing against the fellow teams to be the best.

Winners of Technopoly:

FE 1st Prize: Nandita Kumar, Pourmami Pottekad, Kaushik

SE 1st Prize: Atharva, Shubham Loya and Atharva Kshirsagar

TE 1st Prize: Dheeraj, Honey Berman and Kamal

SHORT-TERM TRAINING PROGRAM

The year 2019-20 saw an upliftment in the standards of the IEEE student branch at SIES GST. Another milestone was achieved, and all the events, workshops and informative seminars helped the members and students.

The events served as a knowledgeable and interesting experience for the students. A week-long STTP i.e. short-term training program held on "Antennas and RF Components Design, Fabrication and Testing" was a highlight event for the year 2019-20. The event had research scholars and PG students and Industry persons who aimed to be inspired and get insight into the various antenna designs, RF components, and its applications. Seminars communication skills, WIE and its Advantages, Higher Studies, Competitive Exams were conducted to induce students with soft skills and preparedness. Line Robotics workshop by Prof. Vivek Nar, IEEE Bombay Section helped the students gain mastery over basic wired robotics. Prof. Priyanka Kadam and Prof. Madhuri Kulkarni conducted a Latex Workshop to educate students about latex software and its applications. Technical head at IEEE SIES GST conducted a 4-day long Python Workshop to teach students the basics of Python. Digital Marketing workshop and Amazon Alexa workshop helped students learn about the knowledge matrix that comes with working as a developer.

The active participation of members, as well as non-member students across all branches, was seen which helped boost the morale of the team and helped them work harder to conduct these events. The year saw a rise in enthusiasm and made it a memorable year for IEEE SIES GST.

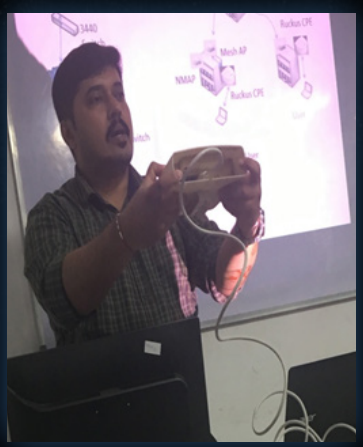
RELIANCE JIO

JIO Industrial Visit was held on 5th September 2019. Students were taken to the Mahape Industrial area to visit Reliance JIO company. Students were enlightened about the various policies and steps taken in the direction to flourish the Indian Electronics Industry and make it compete with the international market. At our industrial visit we studied about Control of home appliances using mobile phones, Home automation through JIO technologies, Role of Internet of Things (IoT) in Home automation, Operation of On-board Diagnostic devices in cars using JIO Applications, Use of JIO Prime Merchant application & Brief introduction to the voice video messaging to be launched in the market.

TIKONA

An Industrial visit to "TIKONA", D-1, Sector 22, MIDC Industrial Area, Mahape Road, Millenium Business Park, Sector 2, Kopar Khairane, Mumbai, Maharashtra was organized by IEEE SIES GST on Thursday, 5th September 2019. Twenty Five students of IEEE SIES GST Student Branch with the Branch Counselor, Prof Biju Balakrishnan visited Tikona to interact with the networking industry and to understand current market scenarios, latest technologies, etc. Students were very excited about this Industrial Visit.

In the afternoon at 1:00 pm, we reached Tikona. We were greeted by Mr. Jayakrishnan Nair, DGM of Tikona, Ghansoli Office. Mr. Jayakrishnan gave us a brief introduction to Tikona and told us about the aims and ambitions of the company. He then introduced us to his Manager. Mr. Rohit Shetty. The manager spoke to us about the Tikona with the help of PowerPoint Presentation. He told us about the development of Tikona Internet service using a free spectrum, no other company is able to provide internet service through free spectrum and hence, they distribute the internet at such low cost. They are able to do this with the help of software developed by their technical team. He explained to us the netblock diagram and Wireless User Flow. In addition to that, he talked about point to point communication, advantages, and disadvantages of wireless systems. In Surat, Tikona has launched the internet through Facebook. In the end, they showed us a video of Prakash Bajpai (CEO of Tikona) talking about his vision towards his company. The session concluded with a Question-Answer session. Many of the students asked different questions to the manager on current demanding technologies, market scenarios, etc. and he cleared all the doubt and myths which were in students mind about the technologies and the Networking sector. All students were happy with the session.



TIFR

The industrial visit to the **Tata Institute of Fundamental Research (TIFR), Colaba** was held on 21st September 2019. Students were introduced to Dr. Satyanarayana Bheesette. He is the scientific officer for the Department of High Energy Physics in TIFR. Students were also introduced to Mr. Yuvraj who is working along with Satyanarayana Sir. He is an expert in FPGA designs and electronics specialist.

At our industrial visit we studied about the following points:

- Introduction to the particles that are further beyond the basic 3 elements of an atom.The elementary particles such as muons, neutrinos, and quarks.
- Dr. Satyanarayana Sir then explained about his field of study, The High Energy Physics and explained where the studies are used. He then explained about the high energy physics detectors that were built in the 1990s used to detect the elementary particles. He also made us aware of the contributions of the Indian scientists to the CERN hadron collider experiments.
- Iron Calorimeter (ICAL) detector, India's Neutrino Observatory project was introduced and explained. The location of the laboratory and the final goals of the project were explained. After explaining the basics of physics, Sir then further enlightened about the need for Electronics Engineers in the FPGA field.
- The Data acquisition Systems designed for the fast recording of the outputs from the Detectors whose speed tends up to picosecond.

ACHIEVEMENTS

BYTECAMP'19

ByteCamp is the official hackathon of SIES GST organized under ISTE. The theme for this edition was "Giving back to the society". Team Sneaky Beaver(Harsh S. Agrawal, Sricharran Ramaswamy, and Siddhant Meshram) of IEEESIESGST were the 2nd runner up.

PHOENIX 1.0

The Student Activity Committee and IEEE Bombay Section conducted a one day program called "Phoneix 1.0" at K. J. Somaiya Institute of Engineering and Information Technology, Sion. Team IEEE SIES GST secured 1st place in the poster presentation competition.

RF TRAINER KIT

Microwave Theory and Techniques Society of IEEE SIES GST Student Branch received a trainer kit worth $500 for our impaccable performance throughout the year. It was received by Prof. Biju Balakrishnan (IEEE SIES GST Branch Counselor).

STUDENT TRAVEL GRANTS

The IEEE Foundation supports various Education Funds including Student Travel Grants (STG). These grants were offered to help students focus on their goals of advancing their potential in areas not local to them. STG is one of the "Benefits of being an IEEE Member". Students of SIES GST IEEE Student Branch applied for these travel grants. Some of the students who were accepted for the STG are:

Harsh Ramesh (AISYWC'19, Hyderabad)- Rupees 5000
Cibin Chandrasekhar (TELSIKS'19, Serbia) - $500
Siddhant Meshram (IMaRC'19,) - $500
Namit Naik (IMaRC'19) - $500

CHANDRAYAAN-2

7th September 2019 saw great enthusiasm from not only India but all across the world towards a space mission, planned by ISRO (Indian Space Research Organization). It was the 'Chandrayaan-2', an intricate and ambitious mission of landing on the South Pole of the Moon. After the glorious success of Chandrayan-1 and Mangalayaan, all eyes were on the ISRO team that night. Sadly, the mission was not 100% successful, yet it represented a HUGE technological leap compared to previous missions of ISRO. The mission was designed for a detailed study of lunar topography, seismography, mineral identification & distribution, surface chemical composition, thermo-physical characteristics of topsoil, and composition of the tenuous lunar atmosphere, leading to the understanding of origin and evolution of our Moon.

Chandrayaan-2 was launched from Satish Dhawan Space Center, Sriharikota aboard a GSLV Mk-III rocket on the 22nd of July, 2019. It had 3 integrants viz. Orbiter, Vikram Lander, and Pragyan Rover with respective weights of 2379 kg, 1471 kg, and 27 kg. The word 'Vikram' means 'Victory' and 'Pragyan' translates as 'Wisdom' in Sanskrit. The primary mission of Chandrayaan-2 was to demonstrate a soft landing on the South Pole of the Moon and deploy the Pragyan rover. However, during the last minutes of the landing, the communication link between Vikram lander and IDSN (Indian Deep Space Network) snapped when it was just 2.1 km away from setting a milestone. Yet, after 3 days, K. Sivan (ISRO Chief) confirmed that the lander has not broken according to the images acquired by the Orbiter. Even though not fully successful, the mission fulfilled many of its objectives by collecting useful data. The GSLV was also fully successful in the completion of all its maneuvers smoothly to reach the Lunar Orbit. The mission thusly stands 90-95% successful and the first to reach the South Pole of the Moon.

Key Outcomes of Chandrayaan-2:

- A close-up view of Lunar Surface by OHRC (Orbiter High-Resolution Camera)
- Highest resolution solar X-ray Spectrograph
- Mineralogical variations of lunar surface and atmosphere by analyzing reflected solar radiation
- Dual Frequency SAR L-Band Polarimetry Images to study inside of Moon
- Detection of Argon-40 in the lunar exosphere indicating the presence of radioactive Potassium-40 below the surface
- High-Defination 3D mapping of craters, lava tubes(potential sites for habitability), Riles, Graben structures (structural dislocation of lunar surface), and Lunar domes (denoting past volcanism on the Moon)

- Atharva Karnik
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