

January 2022
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IEEE

Sri Lanka Section Newsletter



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Message From The Chairman



Dr Maheshi Dissanayake

Hello Readers,

Welcome to the 1st e-newsletter of the IEEE Sri Lanka Section for the year 2022 and the last newsletter from the executive committee 2021/22.

After nearly two years of embracing virtual platform as a method of conducting activities, IEEE has finally shown green light for its volunteers to travel under strict covid-19 guidelines as set out by the health authorities. Accordingly, Sri Lanka Section would be able to host physical events and engage interactively with its membership. With this hopeful, I am honoured to present this newsletter as the chairperson of IEEE Sri Lanka

During the term of office 2021/22, our executive committee came out with many innovative activities to enhance the member engagement, through virtual platform. Their commitment to the task was evident by the member retention and recruitment statistics. As a result, Sri Lanka Section received the Gold Award at IEEE Outstanding Section Membership Recruitment and Retention Performance for 2021.

Further, the Section was able to secure USD 2500 award as 2021 R10 Section Incentives, which is awarded based on the Annual Activity Report and the merits of the engagements carried out by the Section and its Affinity groups in providing valuable resources to support the local IEEE organizational units and conducting good activities that benefit the members.

In the later months of 2021, the Section was successful in reactivating both Computer Society Chapter and Engineering in Medicine and Biology Society Chapter from their dormant states. The section hosted five webinars in collaboration with its Chapters, namely newly formed Signal Processing Society Chapter, Computer Society Chapter, Engineering in Medicine and Biology Society Chapter and the proposed Geoscience and Remote Sensing Society Chapter during the last 3 months. Furthermore, the finals of Electronic Design Competition, newly introduced 3 Minute Thesis Presentation (3MT) Competition and the newly introduced TechNarrator Competition were held in virtual platform. The Section completed the first phase of its' R10 funded project "Industry-Academia Dialog" in December with a positive feedback from participants and the resource personnel.

A Special General Meeting (SGM) was called in October to present and discuss the proposed changes to the IEEE Sri Lanka Section Bylaws. The approval of the Region 10 was received for the membership endorsed Bylaws. The Sri Lanka Section Students / Young Professional / Women in Engineering (SLSYW) Congress 2021 was held for the 10th time and successfully completed as a virtual event with the participation of approximately 500 student members.

This issue of the newsletter highlights webinars, competitions, outreach events and many more activities conducted by both the student branches and the Section during the past 4 months. The newsletter showcases the unhindered enthusiasm of our membership and their effort and the commitment rendered in achieving IEEE mission and vision.

I take this opportunity to appreciate the hard work of the editorial team. A special congratulations goes to Dr. Ahilan Kanagasundaram, the Section editor and his team for publishing another successful newsletter. My heartiest thanks goes to all contributors of articles and reports. I am confident that the readers will enjoy your hard work.

With year 2021 wrapped up in a high note, whilst organising many activities, the Section will host its Annual General Meeting (AGM) on the 29th January 2022 in virtual platform. I cordially invite you to join the AGM. I thank you all for engaging in IEEE activities, and wish to congratulate especially my executive committee and the volunteers for working towards the betterment of the local IEEE membership. It had been a great pleasure to serve you in 2021.

Enjoy reading and See you at AGM.

Dr. Maheshi Dissanayake
Chair/IEEE Sri Lanka Section

Message From The Editor



Dr Ahilan Kanagasundaram

It is my pleasure to welcome you to the third and final edition of the IEEE Sri Lanka Section newsletter from the executive committee 2021/22. We have also received more than 30 submissions from various organizational units for inclusion in this newsletter issue. We would like to thank all these units for their contribution to this newsletter.

The final edition of newsletter features 11 articles and 18 workshop updates to share expert knowledge among members and interested communities and sharing members' memories and achievements.

Thank you to all the persons who contributed writing the wonderful and inspiring articles, without which there wouldn't have been this newsletter issue. I also must thank Chairperson of IEEE Sri Lanka section Dr. Maheshi Dissanayake and executive committee for supporting me. I wish to place a special thanks to Mr. Anuraj and Mr. Heshan for their efforts behind this edition. Your feedback is of great help to us, do send us your comments to ahilan@ieee.org.

I wish you a pleasant time reading through the final Newsletter.

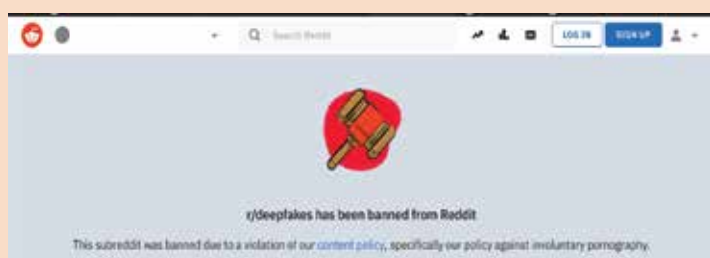
Dr. Ahilan Kanagasundaram
Editor/IEEE Sri Lanka Section

Deepfakes are getting out of hand. Are they the end of the truth?



The advancement of technology has made a new spin on the problem of digital disinformation, specifically with the Artificial Intelligence (AI), generated altered videos. Although digital picture and video fabrication is not new, the rapid development of AI technology in recent years has made it substantially easier and quicker to make convincing fake videos.

In late 2017, a Reddit account named Deepfakes posted pornographic videos built with a DNN-based face-swapping algorithm, which drew the public's attention to AI-generated fake videos for the first time. The account posted fake videos of celebrities engaging in sex acts by substituting the faces of actors in adult movies with celebrity faces. Subsequently, many other users began posting similar videos until deepfakes and the whole subreddit were banned by the Reddit moderators. [1] In consequence, the term "Deepfake" came to the surface to refer to any type of AI-generated impersonating videos. [2]



The gravity of deepfakes was realized when numerous highly convincing deepfakes were published on the internet, shocking the whole community. A popular example would be the fake Tom Cruise videos on the video-sharing platform, Tiktok. The Tiktok account dedicated solely for deepfakes of the famous actor Tom Cruise that successfully incorporated the actor's unique voice and mannerism amused the viewers with its strong resemblance to the actual person. [3]

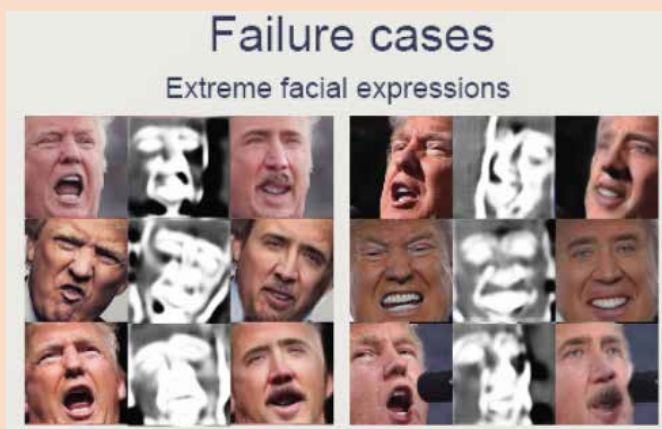
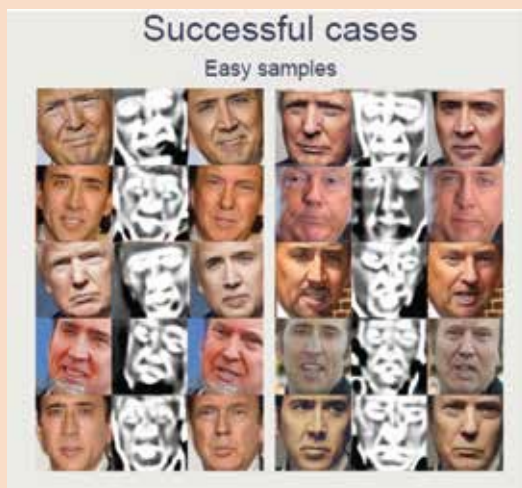


Although most deepfakes were not of any worthy purpose, it was shown that deepfakes can be used for mainstream media when the Korean television channel MBN aired a deepfake of its news anchor named Kim Joo Ha. [3]

The technology behind deepfakes is a deep-learning algorithm called "generative adversarial network". These networks generate an output by setting two AIs against each other. [4]

Deepfakes created through this technology are nearly impossible to differentiate from real faces. However, most deepfakes nowadays are not created using this technology as it is more complex and time-consuming than other techniques. Evidently, most of the well-known deepfakes are made with a combination of AI algorithms and non-AI algorithms. Many deepfake creators have also incorporated the code of the original creator of deepfakes who utilized Google's open-source deep-learning library. [5]

So, can these deepfakes be recognized? The answer would be yes but not always. Identification of deepfakes gets harder with technological advancement. The deepfakes created nowadays are comparatively harder to spot than the ones created a few years ago. In 2018, US researchers discovered that deepfake faces do not blink, which is probably because the majority of the images taken of a video have faces with open eyes. However, not long after that was discovered, countless deepfakes with blinking faces surfaced on the internet. Still, deepfakes can be identified easily when they are of poor quality with odd facial expressions and side profiles, flickering around the edges of the faces, and unsynchronized lip-synching. [6]



As entertaining as deepfakes are, they also create problems on both global and personal levels. However, with little to no legal limitations, the hype around deepfakes may be the best method we currently have to mitigate the negative impact of them.

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IEEE FOR THE COUNTRYSIDE (“GAMMEDDATA IEEE API”) - Phase 2

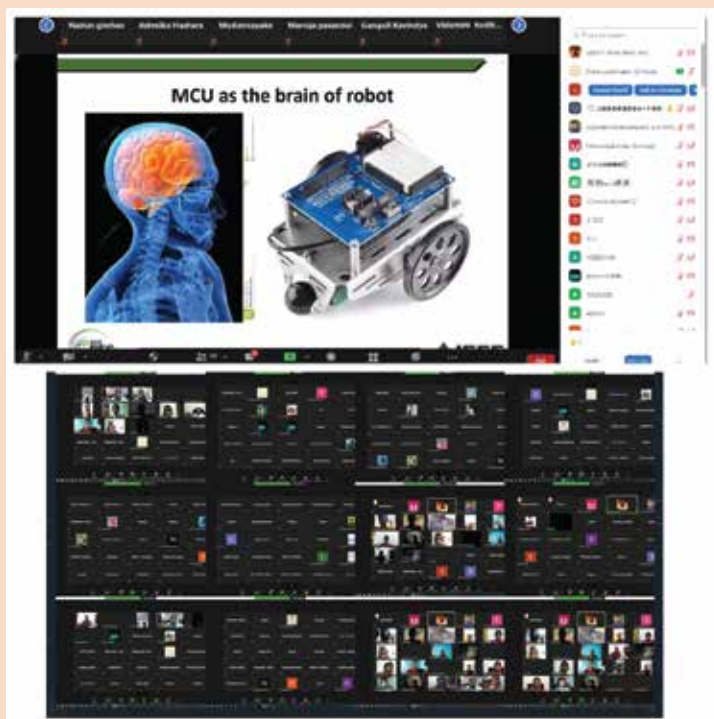
by IEEE PES Student Branch Chapter of the University of Moratuwa

IEEE FOR THE COUNTRYSIDE (“GAMMEDDATA IEEE API”) – Phase 2 which was organized by the IEEE Power & Energy Society Student Branch Chapter of the University of Moratuwa has been awarded as one of the GOLD WINNERS of DARREL CHONG STUDENT ACTIVITY AWARD 2021. It’s a remarkable milestone of the student branch chapter to be affiliated with this award by continuing its glorious streak of that phase 1 has been awarded the DARREL CHONG STUDENT ACTIVITY AWARD 2020 in Silver Category.

Due to the Covid-19 pandemic situation, phase 2 of the project could not be conducted physically. But this situation was taken positively, and an online series of workshops were conducted for two consecutive days of the 27th and 28th of March 2021, including 4 sessions in Sinhala and Tamil medium, covering the interested students throughout the country. The sessions were on “Fundamental concepts of Arduino”, “Fundamental concepts of Drone Technology and DIY Project: Arduino based CNC Machine” and “Machine Learning & Arduino Programming in C++” in Sinhala and Tamil mediums. Phase 2 of “GAMMEDDATA IEEE API” was capable of touching the hearts of over 3000 students of the whole country ranging from grade 6 to grade 13. And it is a pleasure to mention that we were able to make a profound impact and provide a source of inspiration to the students to achieve greater heights despite their backgrounds.



The project “GAMMEDDATA IEEE API” is an initiative of the IEEE Power and Energy Society (PES) Student Branch Chapter of the University of Moratuwa and organized in collaboration with Industry Applications Society (IAS) and Robotics and Automation Society (RAS) Student Branch Chapters and the IEEE Student Branch University of Moratuwa. The project was organized with the intention of motivating and lending a helping hand to the enthusiastic school children from rural areas of the country by addressing their areas of interest in the field of technology so that they can pursue their dreams and bring the maximum out of their potential.



IEEE students

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InspiHER{Tech} V1.0

by IEEE Women In Engineering Affinity Group of SLTC

Exposing and stimulating female undergraduates to adapt to the rapid development in the science and technology field has become a necessity nowadays. With that aspiration, InspiHER{Tech} V1.0 was organized by the IEEE Women In Engineering (WIE) Affinity Group of SLTC to inspire all island-wide female undergraduates to strive toward success in their STEM career paths. InspiHER{Tech} V1.0 is a technical competition dedicated to all island-wide female undergraduates which provided a platform for the rising of exemplary women professionals with strong leadership skills who can work together as a team and to show their skills in the STEM fields.

Hopefully, InspiHER{Tech} V1.0 inspired 204 female undergraduates representing 21 universities as 68 teams of 3 members each in Sri Lanka by encouraging them to strive towards their success and professional growth with a competition of 3 rounds which was very supportive for them to showcase their very own talents to the whole community.

- Round 1 - InspiHER{CircuitriX}:
A Circuit Designing Project Competition.
- Round 2 - InspiHER{MindFest}:
A Technical Quiz.
- Round 3 - InspiHER{CodeWars}:
A Programming Competition.

The opening ceremony of InspiHER{Tech} V1.0 was held on the 11th of September 2021 at 7.00 p.m. virtually with the participation of the honourable guest speakers, special invitees and the contestants. Dr.Surani Tissera, Senior Lecturer at SLTC, Mr.Keerthi Kodithuwakku, Co-founder and the Chief Executive Officer at Effective Solutions Pvt Ltd. and Ms.Shavindya Samarasinghe, Associate Consultant in Business Analysis at Zone 24x7 were the guest speakers of this glamorous evening. Valuable speeches of the guests inspired all the contestants to try their best in the competition with the utmost dedication. As a whole, the opening ceremony was a success with the industrial exposure and the participation of successful professionals in their very own career paths.



Arduino in Proteus, one-day online workshop based on the Proteus software was conducted by Mr Rangika Mark Ranasinghe, Design Engineer at Zone 24x7 prior to the competition for all island-wide undergraduates and technology enthusiasts all over the world despite of the gender. This was an immense opportunity for undergraduates who are in search of Proteus Software due to their academic necessities to expand their knowledge and also it was beneficial for all the competitors of InspiHER{Tech} V1.0 competition as it is required a simulation software in circuit designing for the first round, InspiHER{CircuitriX}.

In InspiHER{CircuitriX}, the contestants were given to design a circuit using Proteus. It was beneficial for all female undergraduates in seeking knowledge, especially for engineering undergraduates, as it is also a part of their curriculum. The participants were given a time period until 21st of September to complete the project and a verbal evaluation on their submissions was conducted by the judge panel on 25th and 26th of September. So they had the opportunity to discuss more about the difficulties they faced and to gain insights from the judge panel regarding the project.

InspiHER{Tech} V1.0

by IEEE Women In Engineering Affinity Group of SLTC

In the most popular contest, flyers were published for all the teams which contained a unique logo designed by the team and photographs of members. The winners were decided by the count of votes. InspiHER{MindFest} was a 1-hour technical quiz which was executed in the Learning Management System of SLTC where many skills such as risk management, teamwork, overcoming challenges, etc of the contestants were assessed by refining the overall knowledge. During the quiz time the contestants were provided with breakout rooms for each team to facilitate the round without any issues.

Despite the concept of a hackathon, InspiHER{CodeWars} was a 6-hour long programming competition. The HackerRank platform was used for the competition to deliver the best experience of a coding competition for the contestants. This empowered female undergraduates towards coding and enclosed the belief that women are not much good in this sector. The contestants were provided with zoom breakout rooms with assigned proctors to solve their technical issues providing a better coding environment virtually.

The Grand Finale and Awards Ceremony of InspiHER{Tech} V1.0 was held on 16th of October at 4.00 pm via Zoom. Dr. Rasara Samarasinghe, Chair of the IEEE WIE Sri Lanka Section, Ms. Warunika Hippola, IEEE R10 Student Representative and Dr. Gayana Herath, Senior Lecturer at Sri Lanka Technology Campus were the chief guests of the glorious evening. Out of 68 exemplary teams from 21 universities, Champions, 1st Runner-up and 2nd Runner-up titles of the InspiHER{Tech} V1.0 were claimed by Team Shadow, Team Divergent and Team Alpha from University of Moratuwa respectively. Team leaders of the top 3 teams shared their experiences by stating the way InspiHER{Tech} V1.0 inspired them and the importance of participating in such competitions. Ultimately, InspiHER{Tech} V1.0 was concluded successfully by inspiring all island-wide female undergraduates.



Your Time Is Now

Time is the most valuable and crucial resource that many of us take for granted. Time is also the universe's most enigmatic force. Any of us who does not understand the value fails to develop our own identity, thus everyone should dare to comprehend and value time in their life to achieve greater success. We may be questioning why time is so important in determining our daily activities; many of us may also be wondering how to take control of time, so I'm here to explain why time is the most important resource to manage.

Working and accomplishing effectively on your life goals within a specific time frame is known as time management. Effective time management entails prioritizing the most critical tasks in accordance with the timetable. Because time is usually considered to be a limited resource for everyone, time management also entails making the greatest use of it.

The first step toward successful time management is to determine which projects are worth investing time in based on your deadlines. It is critical to understand which projects and tasks should be prioritized to complete them and move on to the next.

Not only in our professional lives, but also in our personal lives, time management plays a major and crucial role in every one of our lives. Time management includes:

- Accurately setting goals.
- Prioritize each goal wisely
- Setting an appropriate time to bring your work to exact completion.
- Take the required break times in between your allocated tasks.
- Organizing yourself.

Accurately setting goals - When it comes to planning with setting the right goals it is recommended to follow the SMART method this could be a useful formula to bring your goals right from your mind to the clearer form also goals which are more Specific, Measurable, Achievable, Realistic and Timely.

Prioritize each goal wisely - Another point to consider when performing an effective time management plan is to prioritize your tasks in terms of the deadlines assigned to each of them by breaking the list of activities into essential and non-essential tasks and creating a successful plan to which you must devote the most and least time of your days and months. For example, the most important task should be given the most time, while the rest can be distributed as needed.

Choosing a suitable time - Because you know how long it takes to complete a given activity, it's entirely up to you to take responsibility for meeting deadlines and completing your duties. Ask yourself how much time and for how many days you need to allocate for each work. To plan, you should use tools like your desktop calendar, to-do list, or any of your editable pages.

Take the necessary breaks in between your assigned responsibilities - It is sometimes impossible for each of us to stay concentrated and motivated until we have completed our entire activity; therefore, it is recommended to take enough rests in between to recharge your batteries. Consider listening to music, reading an offline book, going for a short stroll, or even taking a quick nap.

Organize yourself - Don't pile too many documents on your desk. Replace useless files with relevant folders and put away unnecessary documentaries. It might help you save a lot of time when looking for documentaries. Also, organize and use your schedule, which should be filled with key meetings, hang-outs with who and which friends, and time spent on whatever activity.

Your Time Is Now

Benefits of Time Management

Let us investigate it further on what are the benefits of Time Management and how does it help us succeed.

1 Makes it easier to achieve goals - Using a thorough and effective time management method makes it easier to reach our goals because it is not a system that forces you to finish two or three tasks at once, but rather one task after another. You will become more disciplined and punctual as a result. It helps you prioritize your work - As discussed above following the time management approach helps you plan and work accordingly also work and spend time on other activities in between and plan.

2 Get more done in less time - Dedicating time to a certain task allows you to concentrate more on it. If you keep to the schedule, you have a better chance of finishing the job. Consider getting involved with a project. If you don't set aside time to work on things, you'll most likely forget to finish them. If you have an effective time management plan, you can devote enough time to each task to fulfill your deadlines.

3 Decrease Stress - You may have seen that if you maintain things without a clear strategy, you are more likely to become concerned, and it may even deteriorate to the point where you are unable to complete tasks. Therefore, because you have a clear strategy in place and are now able to finish multiple projects and activities without forgetting anything, this technique helps you to reduce stress.

4 Prevent you from procrastinating - Procrastination can lead to tension, lack of attention, and results that aren't as satisfying as you'd hoped. Breaking down your duties into important and non-essential will help you work more efficiently and get things done faster from one to one, allowing you to overcome any unfavorable aspects of work.

5 Boosts self-esteem and opens doors to a promising career - Managing a proper time management approach also assists you in getting things done on time and learning this will be beneficial throughout your career development. For example, if you get hired, you will be capable of becoming a dependable employee who consistently produces high-quality work on time. This improves your professional reputation, improving your employee value and giving you more opportunities to grow your career.



Nishma Mohideen
Informatics Institute of Technology (IIT)

ROBOTRICKS 21/22

by IEEE Robotics and Automation Society of University of Peradeniya

ROBOTRICKS 21/22 is an initiative taken by the Robotics and Automation Society of the University of Peradeniya to provide theoretical and practical knowledge for young enthusiasts who are passionate about robotics and automation. Being started on the 29th of May 2021, it went on for about 5 months under two phases comprising of six webinars done by the experts in the field, two practical workshops, and robotic simulation competition.



Phase 1

Day 1 (on 29th of May 2021)

The very first event of ROBOTRICKS 21/22 was an introductory webinar to the field of robotics conducted by four graduates from the Faculty of Engineering, University of Peradeniya, who have gained extreme knowledge through their undergraduate projects and international robotics competitions.

Explaining some mind-blowing robotics projects, the panelists enhanced the enthusiasm of the young participants by elaborating the opportunities of being passionate about the modern world of robotics and automation.

Day 2 (on 11th of July 2021)

The second webinar was an introduction to the Webots simulation software which is a versatile virtual robots simulation platform. The session was done by Dr. Nalin Harischandra, a senior lecturer in the Department of Electronic and Electrical Engineering, University of Peradeniya.

Day 3 (on 28th of July 2021)

The next webinar was conducted by Dr. Tharindu Weerakoon, a senior lecturer in the Department of Electronic and Electrical Engineering, the University of Peradeniya who is also a reputed researcher in the field of robotics. Focusing on some theoretical aspects of robotics, it covered a few advanced topics namely mathematical modeling, robotic control, and path planning. These are some essential mathematical concepts to know when planning the mobilization of a robot.



The two-day workshop (on 01st and 2nd of August 2021)

Rather than piling up theories, the participants could also gain hands-on experiences on creating their robot using Webots simulation software through a two-day practical workshop done by Mr. Udula Ranasinghe, the secretary of the Robotics and Automation Society. The session became a novel experience for all the energetic participants as they finally could view the output of a simple obstacle-avoiding robot.

ROBOTRICKS 21/22

by IEEE Robotics and Automation Society of University of Peradeniya

Phase 2

Day 1 (on 17th of August 2021)

Delving deeper into the field of robotics, the first webinar of phase two covered sensor fusion, which can be defined as the ability of a robot to bring together many sensors to form an accurate image of the surrounding environment. It was interestingly conducted by Dr. Janaka Wijayakulasooriya from the Faculty of Engineering, University of Peradeniya, an expert in the field with extensive knowledge and experience.

Day 2 (on 30th of August 2021)

The second webinar was on estimator design which deals with the sensors and appropriate math to determine the state of a robot. It was conducted by a graduate from the Faculty of Engineering, University of Peradeniya, and a Ph.D. holder, Dr. Maleen Jayasuriya. The session was done along with the demonstrations covering many interesting topics such as probability theory and the Kalman filter algorithm.

Day 3 (on 15th of September 2021)

The final webinar was on motion control for robotic applications which is a concept related to controlling the movement of a robot to perform a work in precise speed, position, and torque control. The webinar was conducted by Professor Lilantha Samaranyake from the Department of Electronic and Electrical Engineering at the University of Peradeniya, who is an expert in control robotics and automation areas.

All the knowledge-sharing sessions including webinars and workshops were uploaded to the official YouTube channel of the Robotics and Automation society so that they could serve not only the registrants but also anyone with the craving to learn robotics and automation.



Webots Competition

Remarking to the end of the two phases, a competition was held in which the participants had to simulate a line following robot using Webots Simulation software which was a simple task but with some constraints. The submissions were evaluated by a panel of judges. An awarding ceremony was held at the end to applaud the newly approached souls to the field of robotics, where Robot UNICUS 1 was awarded as the most popular robot and Robot MAYWON was awarded as the fastest robot. Adding color to the awarding ceremony, Dr. Pantaleon Perera, the head of the Department of Engineering Mathematics at the University of Peradeniya delivered an inspiring keynote speech about the students' involvement in robotics.

Hereby ROBOTRICKS 21/22 was successfully concluded leaving an inspiration to all the robotics enthusiasts out there to become successful in the field of robotics.

IEEE Young Professionals Sri Lanka

Introduction of IEEE Young Professionals Sri Lanka

IEEE Young Professionals Sri Lanka framed on October 2011 is a vital piece of IEEE Sri Lanka Section and has a past filled with eight years. It is the gathering of IEEE individuals and volunteers who have moved on from their first expert degree inside the beyond 15 years. That is a worldwide local area, whose individuals are keen on lifting their expert picture, growing their worldwide organization, associating with peers locally, and rewarding their local area. Since it envelops all individuals from late college graduates to experienced experts and business people, the gathering is exceptionally different in what it has to bring to the table.

The vision of IEEE Young Professionals Sri Lanka is to be the main expert association for youthful experts and ventures in our motherland. And furthermore, the mission is to build the business individuals' association in the association and enhancing the acknowledgment for the association among the enterprises to draw in and advantage new alumni.



What do you expect from an IEEE Young Professionals Sri Lanka?

IEEE Young Professionals is a dynamic local area of architects, researchers, and specialized specialists with part portrayal around the world and all through IEEE social orders. IEEE Graduates of the Final Decade (GOLD) was made in 1996 as a participation program to help understudies progress to youthful experts inside the bigger IEEE people group and in recent years it has changed to IEEE Young Professionals.

IEEE is the main expert relationship for the headway of innovation. Within excess of 400,000 individuals in more than 160 nations, IEEE is the world's biggest specialized proficient society. Through its worldwide participation, IEEE is a main expert in regions going from aviation frameworks, PCs, and media communications to biomedical designing, electric force, buyer gadgets, and numerous other specialized regions. Individuals depend on IEEE as a wellspring of specialized and expert data, assets, and administrations. To cultivate an interest in the designing calling, IEEE likewise serves understudy individuals in schools and colleges all throughout the planet, advocates for the calling, and assists with acquainting innovation professions with youngsters around the world.

As indicated by my perspective, IEEE Young Professionals in Sri Lanka is the world's biggest expert association committed to progressing mechanical advancement and greatness.

What do you hope to accomplish if you join the "IEEE Young Professionals Sri Lanka"?

When joining the "IEEE Young Professionals Sri Lanka", I can acquire important advantages to my future life achievement.

Some of them are,

- I can get familiar with myself
- I can grow delicate abilities
- I can figure out how to draw in with different gatherings of individuals
- I can acquire administration abilities
- I can get a break from my examinations
- I can grow my resume
- I will actually want to reward the local area.

Cybercrimes and Security on Social Media

The impact of social media on people's lives is enormous. Through social media, people can communicate and collaborate with anyone in the world and can entertain themselves. Social media is a good platform for entrepreneurs to promote their business too. As a result of the Covid-19 pandemic, people tend to work from home relying on computer systems, mobile devices, and different social media platforms. The usage of social media platforms for communication, sharing information, business purposes, and shopping increased to mitigate the impact of social distancing. Cybercrime will rapidly rise because of the widespread use of social media. The increase in volume, velocity, veracity, and variety of data in social media networking is a major concern that may lead to privacy and security issues. Cybercrimes will create a massive impact on the security of people in the future.

Social media is a computer-based technology that enables people to interact with each other around the world and it helps to discover new things too. People can exchange data, pictures, videos through social media platforms.

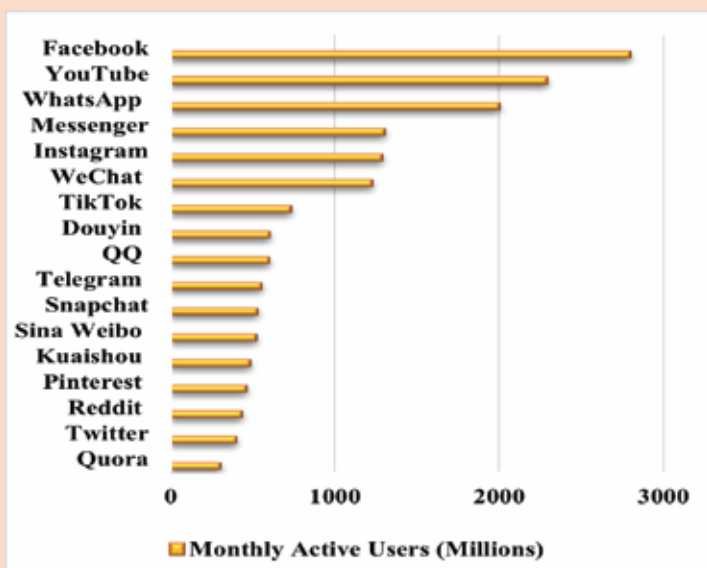


Figure 1. Different social media platform users of April 2021

Among all the social media platforms Facebook, YouTube, WhatsApp, Messenger, Instagram, TikTok, Twitter, LinkedIn, Telegram, etc. are at the top. There are around 4.33 billion social media users worldwide in 2021, which's more than 55% of the global population.

Cybercrime is a criminal activity carried out against computers or devices to damage them or to harm sensitive data of individuals. Cybercrimes such as committing frauds, trafficking pornography of children, stealing identities, trafficking intellectual property, etc. can happen through social media. With the huge increase in social media usage cybercrimes raised day by day. Hackers try to get access to social media accounts of people and attack the financial and personal information of people suspiciously. As a result of the Covid-19 pandemic, people all around the world were compelled to work from home, reliant on the internet. As a result of this situation, cybercrime will become a bigger problem in 2020 and 2021.

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Cybercrime has been identified as a major global threat. Cybercrime rate increases with the rapid use of social media platforms. Figure 2 shows how cybercrime complaints increased from 2016 to 2020 according to the data provided by the internet crime complaint center (Institute.org, 2020).

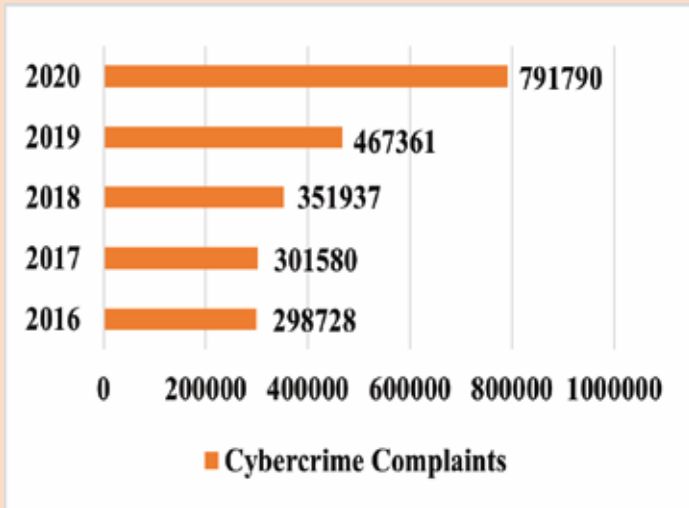


Figure 2. cybercrimes complaints (2016-2020)

Main cybercrimes related to social media are discussed here.

1. Cyberstalking and cyberbullying

Cyberstalking and cyberbullying mean a crime where an attacker harasses a man/ woman using any social media platform or any other medium. Cyberstalking may include threats, cryptic messages, or sexual content.

2. Identity theft

Identity theft means obtaining Personally Identifiable Information (PII) of people through social media platforms. Credit and Debit card frauds, online shopping frauds, driver license identity theft, child identity theft, mail identity theft, etc. are some identity thefts that occur mainly.

3. Social engineering and phishing

Social engineering can be defined as tricking a user into giving up his or her private information. Phishing is a type of fraud that uses social engineering techniques. It is an attempt to acquire sensitive data of people such as passwords and credit card details by masquerading as a trustworthy person or business in an electronic communication.

4. Burglary using social networking

Social media burglars search for the personal information of people such as place of work, birthday, contact numbers, interests, etc. using their bio. Burglars keep attention to the posts shared by people about their trips, dinner outings, etc. to make their targets easy.

5. Malware (Malicious software)

Malware can be defined as a program file that will be harmful to computer users. It includes computer viruses, trojan horses, bots, worms, spyware, adware, etc. Through malware deleting sensitive data, monitoring user's activities, stealing data, encrypting sensitive data can happen.

6. Cyber-casing

Cyber-casing uses geotagged text, photos, and videos to criminals. Geotagging refers to the process of adding geographical identification to the photographs, videos, etc.

7. Cyber intrusion and data breaches

In Cyber intrusion, hackers use automated computer programs or files to access the computers or social media accounts of users. Data breaching means accessing the sensitive information of people without their permission.

Most social media-related cybercrimes can be avoided by sharing photos and other personal information only with friends, using separate email addresses for personal and professional accounts, adding an extra authentication step to social media accounts, strengthening passwords while using unique passwords for different social media platforms, and limiting connections on social media platforms. People shouldn't provide their details unless verifying the identity of websites, emails, or messages, and shouldn't share locations when sharing photos. And people can enhance their security by installing anti-virus software, firewalls and updating and upgrading software on time.

Article by:

Shalani Avodya Anudini

IEEE Student Branch of General Sir John Kotela-

HackTron V1.0 - Game Development Bootcamp and Hackathon

by IEEE Computer Society Student Branch Chapter of Sri Lanka Technological Campus

The IEEE Computer Society Student Branch Chapter of Sri Lanka Technological Campus has organized "HackTron v1.0" powered by 99x, the first-ever Virtual Game Development Bootcamp and Hackathon in Sri Lanka to impart knowledge on game development for all enthusiasts and to make new impetus to the game development industry in Sri Lanka. To enhance that aim, we launched the project; "HackTron v1.0" with the highly motivated participation of over 30 universities in Sri Lanka through 90-degree programs related to the Information and Communication Industry.

The project consists of three main chapters

- **Chapter 01: Game Development Bootcamp.**
- **Chapter 02: Inter-University Game Development Hackathon.**
- **Chapter 03: RiseUp -Industrial talks with entrepreneurs.**

As the first chapter of the project, it consists of 10 continuous days of Bootcamp held from 30th September to 09th October 2021. Through the Bootcamp, enthusiasts were able to sharpen their knowledge on 3D & 2D Game Developing, Concept Art Designing, and 3D Designing with Unity Engine, to compete in the Hackathon to be the best. The entire Bootcamp was conducted by Resource Persons from Prodigy Interactive, RAM Studios, and Heladev. Upon completion, participants were evaluated by four tasks; Concept Art & 2D Designing, Scripting Task, 3D Graphic Designing, and Terrain Designing Task, and top performers in each task were awarded specialization certificates and 2 million worth of game development scholarships.

Parallel to both chapters, a Panel Discussion named "RiseUp -Industrial talks with entrepreneurs" was held for 3 days about the future of the industries; IT, Game Development, and its startups with the presence of well-recognized entrepreneurs from Shout-OUT Labs, Prodigy Interactive, RAM Studios, Youlead, Magicbit (Pvt)Ltd and Fcode Labs, to impart the knowledge on startups for the younger generation, willing to bloom in those industries.

As the second chapter of the project, the Inter-University Hackathon consisted of 6 weeks held from 11th of October 2021 to 14th of November 2021 in three main rounds. Teams, consisting of 2-5 members in the same university were asked to submit a game development idea through a proposal, under the given structure for the first round. Thereafter, 30 teams with the best gaming concepts were selected by a judging panel and asked to provide their gaming ideas through a proposal with the demonstration in front of a judging board for the semi-final round. In the final round, top-ten gaming ideas were selected among them and invited to demonstrate their developed game in front of the judging board, after being given 2 weeks to implement the gaming ideas as their preference. Upon completion of three rounds, the top three developed games were awarded the cash prizes of;

■ **Rs. 100,000 for the winner**

■ **Rs.75,000 for the first runner-up**

■ **Rs. 50,000 for the second runner-up**

Meanwhile, the Most Popular Game Trailer Video was selected through a voting round. Apart from that, two teams were awarded internships at RAM studios as special awards and all competitors were given a participation certificate.

The main purpose of this Hackathon program is to provide the practical knowledge, guidance, and assistance of the game development sector to undergraduates who are willing to bloom in the IT industry. Therefore, if any undergraduates who will participate in this Hackathon program, will be able to enter the IT industry without any fear or any unconfident level of themselves. Therefore, they will eventually be able to decide the path that they need to achieve their dream careers and the way to rise in the IT industry to gather experiences from the Hackathon of the project; "HackTron v1.0".

HackTron V1.0 - Game Development Bootcamp and Hackathon

by IEEE Computer Society Student Branch Chapter of Sri Lanka Technological Campus

In conclusion, we were able to carry out the responsibility of developing the strategic initiative HackTron v1.0 as the first-game development platform for enthusiasts in Sri Lanka. With the hope of making a new revival in the fields of IT and game development, we are planning to launch this project in the next coming years, targeting to reach the international stage as the newest impetus in Sri Lankan gaming history.



The Circuito' 21

by IEEE IES student branch chapter of SLTC

The 'Circuito '21' is an ingenious project that was structured for the first time in SLTC history. This project was organized by the IEEE IES student branch chapter of SLTC, with their immense support the event was conducted through three complete months. This project was able to bring knowledge of circuits and PCBs while craving the skills of innovation. From the project point of view, this was a great opportunity for the Sri Lankan youth. Moreover, our university opened a new door for all our young inventors to nail their capabilities and it was an inspiration for all Sri Lankan inventors to think differently and creatively. The whole project was categorized into three main phases. 1. The Awareness Webinar on Inventions and Innovations 2. The PCB Workshop Series 3. The Virtual Exhibition and Competition. Our basic project aims were to provide the basic and practical knowledge on designing PCBs, to create a great opportunity to discover new innovations among the Sri Lankan youth and exhibit their creations via an island wide virtual exhibition.

An Awareness Webinar on Inventions and Innovations was conducted as the first event. This made participants aware about Inventions and Innovations. The Webinar was conducted on 7th of September 2021, via zoom online platform and Dr. R. U. Halwathura was our honorable keynote speaker for the event. . He is the youngest professor of Civil Engineering in Sri Lanka and a senior professor at University of Moratuwa, Sri Lanka also he joined as a judge in the judgment panel of our competition. Main Objectives of the Webinar were to give the participants good guidance to be an Inventor, to provide knowledge about the basics required to become an inventor, for the beginners of the field. Further discussed the common problems faced by the inventors and answered the problems of the participants and informed the participants about the Virtual Exhibition and the Competition.

The Circuito' 21

by IEEE IES student branch chapter of SLTC



CIRCUITO '21
AND OF YOUR ELECTRICITY

PHASE 1
WEBINAR
6th SEPTEMBER

Prof. Rangika Halwatura who is an outstanding senior professor at University of Moratuwa and a Civil Engineer in Sri Lanka will be the guest speaker. Motivation and enthusiasm will be delivered to the inventors who are willing to invent something new.

PHASE 2
WORKSHOP SERIES
13th SEPTEMBER
20th SEPTEMBER
27th SEPTEMBER

The PCB designing webinar series will be held for 3 days and the first two days will be based on theoretical knowledge. The final day will consist of a practical workshop which includes manufacturing PCBs and a workshop project. The participants who score more than the allocated cutoff marks for the assignment will be offered an e-certificate.

PHASE 3
EXHIBITION
2nd OCTOBER
3rd OCTOBER

Present your new ideas and inventions through the Virtual exhibition to showcase your talents. The winners will be given amazing cash prizes and scholarships.

REGISTER NOW

SLTC INSTITUTE OF INNOVATORS

The PCB Workshop Series was conducted as a webinar series and there was one session per week. In other words the event took place for 3 consecutive weeks, one session per week. The workshop series was conducted by Prof. Ruwantha Pushpika. He is currently working as a Mechatronics engineer who likes to take a multidisciplinary approach in product designing involving conceptualization ideation, R&D to production & after services. In addition, to make this project more interesting for our workshop participants a take home assignment was assigned. It consisted of questions from the content of the theory sessions to improve and evoke innovative thinking. The assignment was evaluated by the instructors from the Institute of innovators and further supervised under our professors. The Originality of idea, clarity of idea, skill and thoroughness, creativity, understanding of engineering, scientific, technological principles were the criteria for the assignment.

At the end of the Workshop Series, a Virtual Exhibition was held along with a competition. This was the third and last phase of the project. The exhibition commenced from 22nd to 24th of October 2021.

This was an open exhibition which was categorized into College Level and Above College level, to showcase new inventions and innovations. The participants had to throw one's hat in the ring under the theme of Combating challenges of the 21st century through innovation. This platform was introduced for all the inventors and those who are willing to think creatively. All the creative innovators, island wide can publish their creations for the exhibition under the theme that is mentioned above.

The submitted inventory exhibits were judged by a respected panel of judges. It was important to vote on the submissions that had been published. Winners of the above college category which also includes undergraduates received scholarships packs and valuable certificates and the winners of the above College category received valuable awards. In detail, out of all the contestants who participated in the competition and the virtual exhibition, five innovations were selected by the judgment panel and they were awarded the prestigious title of "Most Honorary Invention" with a medal and a certificate of recommendation.

On 30th of October the project was successfully terminated with a grand closing ceremony and a prize giving. Fortunately we were to fill everyone's heart with happiness and a value for their talents. In reality we faced few ups and downs while we were walking on the path of success but, gladly there were strong stems who remained continuously to give us hope, strength and courage. Herewith, we would like to express our heartfelt gratitude for all our advisors, sponsors, seniors, organizing committee and our participants for their immense support.

Change Management & Mind Shifting in Cloud-Based Systems

Regardless of whether or not the workforce adapts to changes, the arena always produces challenges. Shifting from old methods of working to digitalized techniques requires shattering the glass seal, but in order to do so, we may need to employ a variety of strategies. Taking end users out of their comfort zone to increase agility is what we need to do if we are to succeed in change management.

Before we get into the details, let's take a look at the top six typical challenges that any organization faces during critical changes due to a lack of

01) Mentoring & Coaching - Employee stress and anxiety are rising as a result of increased workload and pressure from new changes that are not being communicated and coached.

02) Communication Plan - The communication vacuum that exists between the user and the management during the transition period and beyond. As a result of this misinterpretation, erroneous output and the implementation of inconsistent processes and workflows may result. Making necessary corrections will be a time-consuming undertaking.

03) Lack of expertise resources - Most organizations do not have the necessary skills to respond to these changes. As a result, handling inconsistencies and execution delays are introduced. While the staff is capable of working, some staff members may have less capacity for adapting to changes and delegating.

04) Monitoring - An inadequate level of end-user monitoring, leading to difficulty in executing and completing specific processes on time, could lead to unexpected issues & risks.

05) Data Migrations - If you do not have a plan in place to migrate data from legacy systems to the cloud, most enterprises will face numerous difficulties. As a result, data discrepancies arise, and an inaccurate picture of the organization is painted.

06) Quality Management - If the system is not verified to guarantee that it is functional software and that the data migrated & existing is producing accurate information, the deployment may be delayed, resulting in additional resources, funds, and time being spent.

On the other hand, cloud-based systems have a plethora of benefits for any organization, including cost savings, mobility, adaptability to change, competitive advantage, and disaster recovery, to name a few. As a result, addressing the six factors mentioned above is essential for successful change management. Let's take a deep dive into some of the solutions we can use to either eradicate or ensure that those do not occur in the first place.

On a broad scale, the solutions include

A)

Realization of Benefits - Change management could begin with instilling a great deal of insight & the benefits to the employees and the business in the minds of their employees. Identifying and addressing the need to improve the overall corporate experience has measurable financial and personal benefits. In this case, reducing the current workload the advantages of being able to see data at a glance and meeting milestones on time are examples.

B)

Coaching Camps - Many companies hold coaching camps as improvement strategies. However, the key question any business should ask themselves is: "Is this coaching realistic and appropriate for our ever-changing world?" Delegation of work at work, work-life balance, communication training, professional growth of their work ethics and time management are some of the types of coaching that are required in Change Management.

Change Management & Mind Shifting in Cloud-Based Systems

C)

The method of communication - Change management should welcome staff comments, suggestions, and recognition of those who have invested can instill confidence in them that they are valued. It is beneficial to start with a positive feedback channel for the organization. For example, Human Resources has a dedicated channel to communicate with employees.

When a new system is introduced, some may fear they won't be able to adapt due to the speed of adoption, while others question their job roles. Others are extroverts who prefer face-to-face conversation. Maintaining excellent working relationships with employees is crucial to a smooth cloud-based transition.

D)

Building skilled workforce - It is desirable to adapt a hiring plan specifically for the transition in order to pick qualified people to lead the transition process. It should be part of the plan to further integrate them into the organization in order to ensure the system's long-term viability. Organizations may need to invest additional time in end-user training and refresh training on the system and processes for a period of up to a year or longer, and then as needed in the future, depending on organizational requirements.

Conclusion

The success of a cloud-based system implementation relies heavily on effective change management. People management and mindset shifts are equally vital to address during this process. As a result of this engagement, the business will meet its forecasted ROIs.

Chathura D. Wijeratne
Manager - Projects and System Support Division
Berendina Micro Investments Company Private Limited



5-Minute Video Clip Contest

by IEEE Signal Processing Society, Student Branch Chapter, University of Moratuwa.

● Purpose of our Student Branch Chapter

The first technical society of IEEE, the Signal Processing Society's mission is to advance and disseminate state-of-the-art scientific information and resources. The signal processing community within our university, being a supportive pillar to this global mission, we aspire to increase enthusiasm about signal processing among Sri Lankan undergraduates and provide a venue to interact and exchange ideas.

● 5-Minute Video Clip Contest

Our Society has been able to take our country's name to the world by becoming the global champions of the IEEE Signal Processing Cup 2021 and IEEE ICAS Challenge 2021. In our attempt to share these experiences among Sri Lankan undergraduates and provide a platform for them to disseminate their knowledge to others in the community. With the support from the London Stock Exchange Group, we were able to propel students to explore signal processing concepts we organized the 5-Minute Video Clip Contest.

● Workshop 1 - "How to tackle a global competition"

Our first workshop in the competition provided a platform for the supervisors and team members of Team T-Cubed and Team DigitX from University of Moratuwa, the global champions of IEEE Signal Processing Cup 2021 and IEEE ICAS Challenge 2021 Challenge to share their valuable experience on competing in a global competition. Both teams elaborated on presenting and how they approached each task for their respective competitions. Team DigitX further focused on the use of animations for presenting and how to cater the audience. Team T-cubed while doing presentations not to underestimate the intelligence of the audience or over-estimate their knowledge and how to prepare for Q and A sessions.

With the live participation of more than 50 students from various universities, this workshop concluded successfully while encouraging and inspiring participants through some wonderful ideas to improve their videos for the competition.

5-Minute Video Clip Contest

by IEEE Signal Processing Society, Student Branch Chapter, University of Moratuwa.

● Workshop 2 - "Signal Processing in Financial Markets"- Greener Pastures in Global Fintech for Engineers

For our second workshop, our sponsor LSEG helped us showcase real-world use of signal processing. Mr. Thayaparan Sripavan and Mr. Najith Liyanage from LSEG were the speakers of this workshop, who showcased how the signal processing techniques are used in financial markets for risk analysis, hardware acceleration and many other latest technologies in real world application.

Participants of this session were able to gain some knowledge of opportunities in Fintech. At the end of the session, the audience got a remarkable opportunity to clarify their doubts regarding their prospective career goals in Fintech from the speakers. With over 50 live participants, this workshop was another success of the workshop series for the 5MVC Contest.

● Evaluating the videos of the contest

The evaluations and the awarding ceremony was successfully conducted to acknowledge and showcase the hard work done by the competing teams to win the grand prize of the 5-Minute Video Clip Contest. The contestant videos were evaluated by Dr. Ranga Rodrigo, Dr. Tharaka Samarasinghe, and Dr. Kasun Hemachandra from the Department of Electronic and Telecommunication Engineering, University of Moratuwa, who have years of experience researching and teaching complicated signal processing topics. The judges encouraged the contestants to keep making educational videos and to look into conferences such as the Conference on Computer Vision and Pattern Recognition (CVPR) to get an idea about the gold standard. And finally, thanked organizers for taking such an initiative to improve presentation skills of students.

The Chief Guest Dr. Maheshi Dissanayake, Chairman of the IEEE Sri Lanka Section, apprised the participants about the significance of taking an interest in competitions as a step of the learning process. Concluding the award ceremony was recognizing the effort put by the participants to disseminate their knowledge to the community. The winning teams of the competition are as follows.

- Grand Prize – Team Focus from University of Moratuwa
- 1st runners up – Team Quattro from University of Jaffna
- 2nd runners up – Team Cura4 from University of Moratuwa
- Sponsor's choice award – DOPLgangers from University of Moratuwa
- Most popular award – Mora Blasters from University of Moratuwa
- Best Tamil video – Mora Blasters from University of Moratuwa
- Best English video – Team Crew from University of Moratuwa



Data is the New Oil in This Era

Welcome to the Age of Big Data!!!



In this era, data is the most valuable asset for us. Just as how we can make the best when oil is transformed into more productive objects when data is also processed, analyzed, and utilized effectively and efficiently it has a better value [1].

Big data can be understood as the data characterized by four main attributes: volume, variety, velocity, and value. Since the evolution of data from early days it has been in bytes, kilobytes and when moved into desktops data increased to megabytes and gigabytes. Then after the introduction of the World Wide Web data increased further to terabytes, petabytes and today data is available in exabytes and zettabytes as well. So in this era, big data is used and stored in the top big databases of large companies for many useful purposes which include their customer's data.

Why do companies rely on big data?



Figure 2 : Analyzing of Big Data
Source : Adapeted from [2][3]

The main straightforward answer is to use this data to analyze customer behavior and to make predictions based on the analysis[2]. This concept is evolved at the beginning of the 21st century and by now every giant company is making use of this concept. A very enormous amount of data is produced by these giants every day. So this is one of the biggest revolutions in the field of information technology. The data obtained from different resources[3] in a variety of sizes use advanced Tools and techniques to analyze these data sets.

How big data is used in user profiling?

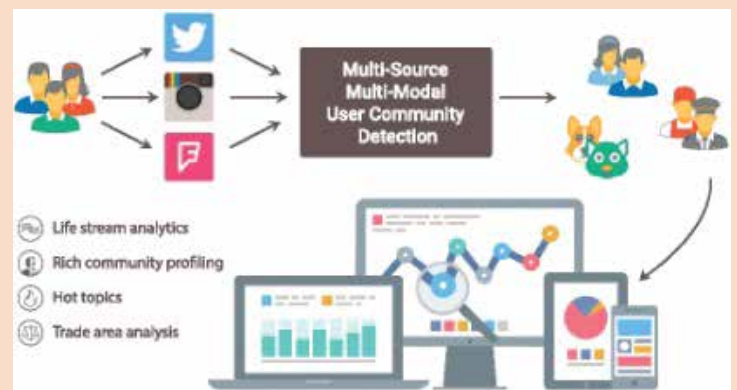
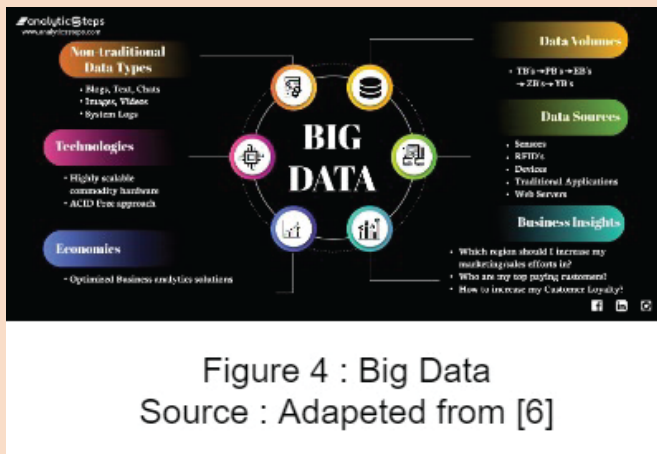


Figure 3 : Big Data
Source : Adapeted from [4][5]

Data profiling is the process of examining data from an existing source and summarizing information based on that data.[4] The quantity of data is simply one aspect of the equation. Data quality is also important. Data that isn't properly formatted, standardized, or integrated with the rest of the database can cause delays and issues, resulting in missed opportunities, perplexed consumers, and poor decisions. [5] Data profiling can assist you in avoiding these problems. You may proactively establish a plan to repair many of your data problems and clean up your data warehouse by ensuring that you run a diagnosis and review the data you have before they have an impact on your company by ensuring that you perform a diagnosis and investigate the data you have.



Techniques for advanced data profiling include using null analysis, key integrity ensures that keys are always present in the data. It also aids in the detection of orphan keys, which provides a difficulty for future analysis. Cardinality examines one-to-one, one-to-many, and many-to-many links between related data sets. This enables BI tools to accurately conduct inner or outer joins. Pattern and frequency distributions check if data fields are formatted correctly, such as emails. Data fields utilized in outgoing messages are quite important like contact details.[6] This work could go in a lot of different areas in the future. Material on the Internet is always changing. The difficulty of determining what is out-of-date and what is still valid is a difficult one and kept for future data scientists to handle.

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Intellecto 1.0

by IEEE WIE Student Branch Affinity Group of General Sir John Kotelawala Defence University

Intellecto 1.0 was a virtual event organized by the IEEE WIE Student Branch Affinity Group of General Sir John Kotelawala Defence University. The sessions were organized to provide an insight to the undergraduates about how programming theories are practically applied in the industry. Intellecto 1.0 consisted of 4 sessions. The first session was held on 30th July 2021 followed by the other three sessions on 06th August, 13th August, and 20th August 2021.



Also, session 4 was focused on different types of Software Testing. At the end of each workshop, a question was submitted through HackerRank for the audience to submit answers.

We are truly grateful to Mr. Nadun Liyanage, Mr. Priyan Perera, Mr. Bimsara Yapa, and Ms. Vindya Gunawardena and for the immense contribution given to our event "Intellecto 1.0" by attending as a speaker and sharing valuable knowledge and experiences to educate our audience.

Also, the collective effort of the Executive Committee members of the IEEE WIE Affinity group and the lecturers of the Faculty of Computing of General Sir John Kotelawala Defence University made the whole event a huge success. All the members of the teams of the event worked in perfect sync with each other.

At the beginning of each session, a reference document was given to the audience. Each session consisted of a practical session and a Q/A session. Sessions 1 covered the OOP concepts using real-world applications and how these concepts are used in the industry. Also, a brief introduction on the currently used tools and technologies in the industry and how to implement a step-by-step case study using those tools and diagrams were unfolded.

Session 2 was focused on describing the usage of data structures, the implementation by using real-world applications, and how to use data structures in competitive programming. Session 3 was focused on threads and Exception Handling in java.



Intellecto 2.0

by IEEE WIE Student Branch Affinity Group General Sir John Kotelawala Defence University



INTELLECTO 2.0
Advanced Java
with Spring Framework
Exploring the world of Java

24th September 2021
6.30 PM Onwards

SPEAKER
MR. DINANJANA GUNARATNE
Associate Tech Lead at :Different PVT. LTD

Organised by IEEE WIE Student Branch Affinity Group
General Sir John Kotelawala Defence University

scan me

Intellecto 2.0 is a virtual event organized by the 2021 Executive Committee of the IEEE WIE Student Branch Affinity Group of General Sir John Kotelawala Defence University. The session was organized to provide an insight to the undergraduates on the fundamentals of the Java Spring Framework; a popular framework currently used in the industry. The main objective of this workshop was to educate participants on the application level of Java within a framework. The target audience of the session were 1st year, 2nd year, and 3rd year undergraduates from all the universities in Sri Lanka, who are looking forward to work in the industry.

Following the completion of the registration process for the session, a reference document containing the setup guidelines to download and install Spring Framework was distributed. Thereby, it helped the participants to be prepared to do hands-on activities during the session. Mr. Dinanjana Gunaratne, an Associate Technical Lead at :Different Pvt Ltd and also an expert in the Spring framework was invited as the speaker for the session. The workshop was conducted via Zoom platform on September 24th 2021, at 6.30 pm with an audience of more than 90 participants.

Mr. Dinanjana started off the session by giving a brief theoretical introduction to the Spring framework which was followed by a practical session and a Q/A session.

We are truly grateful to Mr. Dinanjana Gunaratne for the immense contribution given to our event "Intellecto 2.0" by attending as the speaker and sharing valuable knowledge and experiences to educate our audience. Also, the collective efforts of the Executive Committee members, the guidance and support that was given by the IEEE Student Branch Counselor Dr. Asela Gunesekera, and our Student Branch advisors Ms. Isuri Uwanthika and Ms. Kalani Ilmini of the IEEE WIE Student Branch Affinity Group of KDU made the whole event a huge success.



INTELLECTO 2.0
Exploring the world of Java

THANK YOU!
FOR JOINING WITH US

Organised by IEEE WIE Student Branch Affinity Group
General Sir John Kotelawala Defence University

TechTalk Rajarata

by IEEE Student Branch of Rajarata University of Sri Lanka

The Rajarata University of Sri Lanka hosts TechTalk Rajarata, a monthly technical session. As a result of the epidemic, we're hosting webinars. We held lot of webinars based on information and technology at each TechTalk session. Accordingly, we held a webinar this year. Our organizing committee envisioned the TechTalk Rajarata for October as a webinar on the Internet of Things that would be relevant to a wide number of undergraduates, and we were able to pull it off.

The way we kicked off our fantastic event

IEEE Student Branch of Rajarata University of Sri Lanka organized an online session on the Internet of Things which came under the 'TechTalk Rajarata' series for October. We conducted this year's TechTalk on October 5th, 2021, at 7pm in the Zoom platform. We used a brief video clip kicked off the event and our program committee chair gave an outstanding welcoming message after that. Following that, we added additional spices to ensure the success of our webinar. Below is a quick guide to this.

What is IoT?

The Internet of Things (IoT) is the capacity for devices to connect with one another over the internet or other networks, providing input to help with decision-making in commercial, industrial, and household settings. This is often accomplished through the use of sensors linked to a back-to-base system. People can use the internet of things to live and work smarter and achieve complete control over their lives. IoT is critical to business in addition to providing smart gadgets to automate homes. IoT gives businesses a real-time view of how their systems work, providing information on anything from machine performance to supply chain and logistical operations.

Who is our outstanding speaker?

Mr. Kasun Dananjaya Delgolla, Chief Technology Officer of Paladin Analytics, our outstanding speaker presented an informative talk on the Internet of Things. I mentioned about Internet of Things earlier. As an example, he presented a clear picture of IoT and demonstrated Arduino in the effective manner. Using a tiny Arduino-based demonstration, he demonstrated how IoT devices can interact with the cloud and how we may remotely operate an IoT device. Mr. Kasun then demonstrated a basic Arduino coding demo and briefly explained a small practical on Arduino.

He demonstrated how IoT devices may interface with the cloud and how we can remotely operate an IoT device via a simple Arduino-based example. As an IoT enthusiast, the speaker has a lot of expertise with the IoT platform.

What is Arduino?

Arduino is an open-source electronics platform that uses simple hardware and software to make it easy to use. Arduino boards can take inputs - such as light from a sensor, a finger on a button, or a Twitter message - and convert them to outputs - such as turning on an LED, triggering a motor, or publishing anything online. By providing a set of instructions to the board's microcontroller, you may tell it what to do. The Arduino programming language (based on Wiring) and the Arduino Software (IDE) (based on Processing) are used to accomplish this. Thousands of projects have used Arduino throughout the years, ranging from simple household items to complicated scientific apparatus. This open-source platform has united a global community of makers - students, amateurs, artists, programmers, and professionals - whose contributions have added up to an enormous quantity of accessible knowledge that may be of tremendous benefit to novices and specialists alike.

Final Touch of our Session

At the end of each webinar, we had a fantastic Kahoot game. In the same way, we had it in this webinar and successfully completed it. In this Kahoot Session, Sivasoruby Kanapathipillai, out 1st Year Student of Rajarata University comes in first, Nipun Dilshan, 1st Year Student of Rajarata University comes in second, and Faseem, 1st Year Student of Rajarata University comes in third. With such a surprise, the speaker astonished both the winners and all of the participants. Finally, Vithurshana Puvenendrarasa, our secretary, offered the concluding vote of gratitude.

At the conclusion of the session, we snapped a picture for this year's remembrance.

This year's TechTalk went off without a hitch and we made it.

Augmented Reality Face Filters – How do they work?



Figure 1: Example faces with face filters applied.



Figure 2: Rainbow Barfing from Snapchat

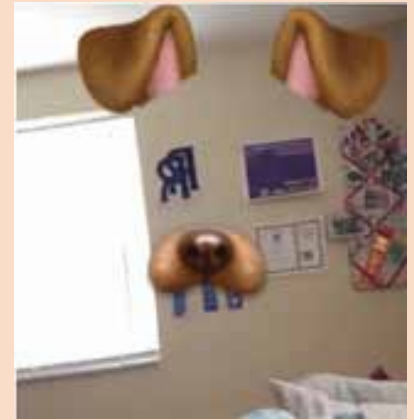


Figure 3: A non-facial region is wrongly identified as face and AR filter is applied to that region.

Nowadays, Augmented Reality-based face filters (AR filters, Figure 1) become more and more popular as they provide endless fun. Although thousands of such filters already exist, more and more new filters are continuously introduced everyday mainly for entertainment purpose. These AR filters can do various things with your face; they can grow mustache in your face, they can wear flower crown on your head, they can transform your face into a bunny face, etc. In addition, some AR filters can also beautify your face and even modify facial features, for example, they can make your nose bigger. Many teenage girls are addicted to face beautification filters and share their beautified faces on social media. Importantly, all of these AR filters run in real time, and with limited resources available on your smart phone. As most of us are familiar with these filters, have you ever wondered what is the technology behind these filters?

In fact, all of these started in 2015 when Snapchat (an instant messaging app) released its version of face filters called Lenses [1], and rainbow barfing (vomiting rainbow, Figure 2) was the first AR lenses launched by Snapchat [2]. Actually, the technology was originally developed by Lookery – a Ukrainian start-up company that developed an application which allowed users to modify their facial features during photos and video chats [3]. Snapchat acquired this company in September 2015 for 150 million dollars, reportedly the largest tech acquisi-

tion in Ukrainian history, and AR filters became a new era for selfie. Later on, in 2017 Instagram and Facebook also adapted this technology.

These AR filters are one of the applications of a rapidly growing, vast field called Computer Vision. Computer vision develops techniques to help computers understand the content of digital images and videos. Although different computer vision techniques are used to develop AR filters by different companies/developers, they have some common stages. They first detect the faces in the selfie (image or video frame), and then find the landmarks of the faces such as nose, eyes, etc., and finally warp the filters on the faces based on these identified landmarks. For example, if you want to wear a virtual hat, you first identify where the face is in the image, and then identify where your head is in the detected face, and finally, you place the hat at the identified head position. The following sections explain these stages in detail.

1. Face detection

Face detection is one of the widely explored area in Computer Vision for locating faces in given images. Face detection has been widely used as the first step of various tasks; E.g., in cameras it is used to auto adjust the focus, in social media such as Facebook it is used for facial recognition, it is used as the first step for biometric identification. There are multiple approaches have been investigated for face detection. One of the milestones among them is

proposed by Paul Viola and Michael Jones in 2001, which is based on Harr filters and an AdaBoost framework. Although it is a popular approach capable of detecting faces in real-time with high accuracy, it may not work properly if a face is covered with a mask or scarf, or if a face is not facing the camera [4]. In addition, various other approaches were also proposed, which ranges from hand-designed features such as SIFT and HOG with classifiers such as SVM to the state-of-the-art Deep Learning models. Deep learning models provide state-of-the-art detection performance; however, they require high-end hardware such as GPUs, which limits their usage in mobile devices. Although there are lightweight deep learning approaches explored recently which are specifically designed for mobile devices (E.g., “BlazeFace” [5] by Google which can process over 200 frames in a second) simpler algorithms are preferred as they provide a good trade-off between high performance and hardware and power constraints. These simpler algorithms sometimes miss faces and wrongly identify non-facial regions as faces and apply AR filters on those regions (Figure 3).

2. Identification of facial landmarks

Once the face is detected, its orientation and its landmarks such as nose, eyes, etc. must be determined. Although the methods proposed for this purpose vary, Active Shape Models (ASM) [6] are one of the prominent methods for this purpose. An ASM is an interpretable 3D statistical shape which represents the average human face by representing it by a set of landmarks. This statistical model is constructed offline with the aid of Principal Component Analysis (PCA) using a database of human faces where the landmarks are manually annotated. To identify the landmarks of the detected face, an iterative algorithm is employed, where the ASM of the average human face is deformed to fit the detected face (Figure 4).



Figure 4: Fitting an Active Shape Model to a detected face through iterations [7].

3. Deform faces or applying filters

Once the facial landmarks are identified the ASM can be deformed to manipulate the original face as in shown in Figure 5, or new filters can be applied on the identified facial landmarks as shown in Figures 1 and 2.



Figure 5: Face manipulation: (a) a face, (b) ASM model is fitted on the face, (c) the model is deformed to close the eyes, (d) The face with closed eyes.

The technology behind AR filters is not new, but developing this to perform in real-time on mobile devices which have limited computational resources is challenging. That’s why Snapchat paid 150 million dollars to acquire Lookery instead of just building its platform [3].

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How to Start a Career in UI/UX

by IEEE WIE Student Branch Affinity Group of Wayamba University of Sri Lanka

Due to the Covid 19 pandemic the possibilities of getting opportunities and experience to shape our career paths have been hindered. So as a helping hand, we thought of bringing a worthwhile session on a modern topic.

The IEEE WIE student branch affinity group of Wayamba University organized a webinar on 'How to start a career in UI/UX' on the 4th of September 2021 via zoom platform for everyone who is passionate about starting up with UI/UX. The webinar was a great success with more than 200+ participants.

The guest speaker for the day was Ms. Sandaru Paranehwa a user experience lead designer currently working at H2O.AI. She conveyed a lot of valuable information that will be important for a beginner to get started and carry on. She gave a well appealing introduction to the topic, explained the difference between UI and UX through examples and made the points more clear through a simple demonstration.

She also marked out the career paths in the field and how to get started. At the end of the session, we had a Q&A session where many attendees raised their doubts and Ms. Paranehwa made clear clarifications for those all.

The feedback we got at the end of the session was really impressive as many were highly satisfied with the session and stated that they had learned a lot. Also they were thankful for bringing an up-to-date but less frequently spoken topic onto the stage. We as a team are focusing on conducting more valuable sessions in the near future too.

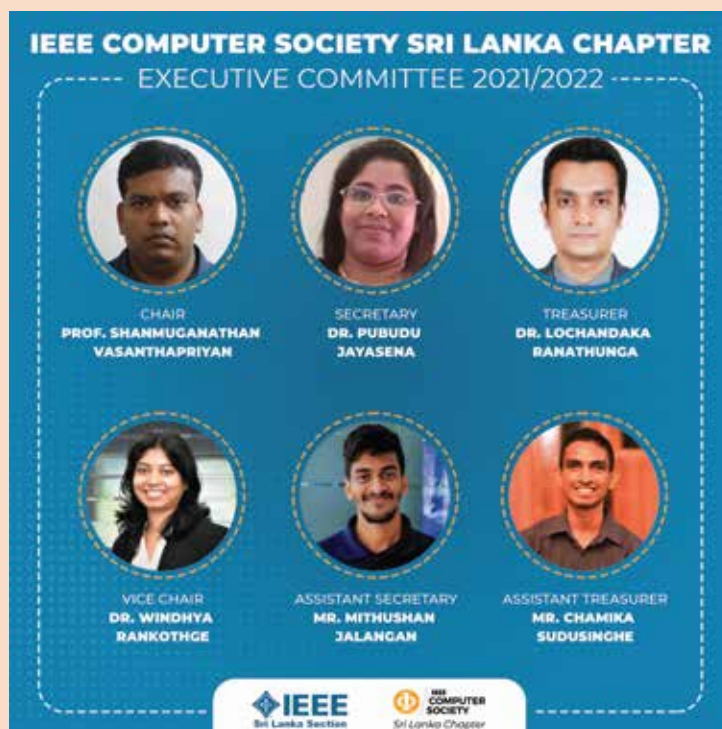


IEEE Computer Society Sri Lanka Chapter

The IEEE Computer Society Sri Lanka Chapter has a well-earned and highly-respected reputation for innovative conferences, engaged chapter activities, trusted standards, quality publications, and dedicated, diverse volunteers.

The Annual General Meeting of the IEEE Computer Society Sri Lanka Chapter was held on the 26th of September 2021.

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A New Approach in Evaluating Container Terminal Efficiency Through Planners' Tasks: A System Dynamics Perspective

Ports are a critical component in the global supply chain. A melting pot of multidisciplinary activities, ports can be considered as an integrated system that relies on each other for smooth operations. This article reports findings of a research based on System Dynamics and simulations using Vensim to showcase the importance of integrated operations and the avoidance of decision alterations

1 Operations Planning in Container Terminals

Container trade handles over 70% of the seaborne trade in terms of value [1]. Total container port throughput is predicted to be 827 million TEUs (Twenty-foot Equivalent Unit) in 2021. If we lay these containers on the equator of the earth, we will replicate it approximately 126 times. That signifies how massive this industry is. When it comes to container terminal operations, container terminal planning performs a critical role which is dynamic. Figure 1 displays how the sub-functions in planning are integrated within the main two functions: i) Quayside planning, and ii) Landside planning.

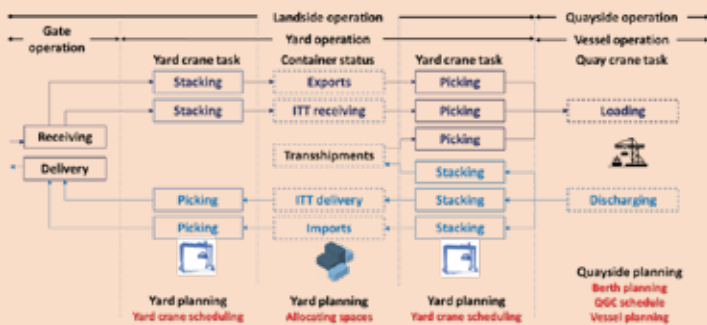


Figure 1 : Container terminal operations flow

Quayside performs loading and discharging operations which are the most important and prioritized tasks within a container terminal according to the interviews that we conducted with terminal managers and planners. Landside includes gate and yard operations. We can categorize container flows based on their operation as Figure 1 displays.

We can find two main agents who perform planning tasks within these two distinguishable areas when the operation is performed: i.) Yard planner for land-side and ii.) Vessel planner for quayside. Kizilay & Eliiyi, [2], have found that around 85% studies focus on separate planning functions. The integrated studies also did not cover the overall integrated planning function [2]. We further find that most of the studies did not cover this aspect in the planner's role within container terminal planning. However, the real dynamics on uncertainty under integrated planning function was not considered in studies [3]. Gunawardhana, Perera, & Thibbotuwawa [4], have discussed the dynamic stacking approach highlighting the importance of understanding the real dynamics in container terminal operations. The key objective of this article is to investigate how this dynamic environment has affected container terminal efficiency by focusing three directions based on the literature: : i.) Limited understanding of integrated planning perspective [2] , ii.) Limited understanding of the uncertainty factor considering crane breakdowns [3] iii.) Insufficient understanding of the planner's role in the terminal planning task [4].

2 Applying System Dynamics into Container Terminal Operations

System Dynamics (SD) is heavily used to approach dynamic problems within operations context [5]. However, it was not a trend in container terminal operations except few studies [6]. SD is used to build the dynamic nature inside container terminals. The stage of problem articulation identifies alterations in the initial plan that is created by the vessel planners and the yard planners is the key to build this dynamic environment. 50 variables are identified after the integrated process was observed carefully. Stock and Flow Diagram (SFD) which is a key step in SD is developed based on these findings as Figure 2 displays. Identifying the loops accurately is one of the challenges in SD. 12 loops are identified where 6 loops are balancing the planning alterations and rest of the 6 loops are reinforcing the occurrences (4). When the model is tested it is verified that the model is accurate based on the tests that are introduced by Sterman [5].

Rise Up Mora 2021

by IEEE Student Branch of University of Moratuwa



IEEE Student Branch University of Moratuwa forged ahead in enhancing the professional skills of the undergraduate community in Sri Lanka with their pioneering initiative RISE UP MORA 2021, which was held from 6th of March to 21st of March 2021. The event, which comprised three phases including two webinars and a series of mock interviews, was held virtually, adapting to the new normal with the COVID-19 pandemic.

Phase 1

Embarking on the journey of “Rise Up Mora-2021”, a webinar - **How to Make a Job-Winning Resume** was held on the 6th of March, 2021. Eng. Zahra Marzook, Electrical Engineer at Ceylon Electricity Board and the winner of the IET Young Woman Engineer Award in 2019, shared expertise on crafting the ideal resume to land on the dream job. Over 250 undergraduates from different universities took part in the webinar and cleared their doubts about making an effective resume that could get an edge on the competition.

Phase 2

The novel initiative “Rise Up Mora” made progress and successfully concluded the second webinar of the series, **How to Excel in an Interview** on the 13th of March 2021, with over 200 attendees.

The guest speaker, Ms. Rovina Vandersay, Assistant Manager of People Development at Nestle Lanka, delivered an extraordinary session covering tips on creating a lasting impression upon the employer and getting hired for the dream job.

Phase 3

In the final phase, 26 leading companies allied with almost every discipline of engineering in Sri Lanka came together to provide the undergraduates a real-time experience of a job interview. Second-year undergraduates of the University of Moratuwa were the main focus group in this phase as they would be the next batch from the university to go for industrial training. The event was concluded after completing more than 250 mock interviews on the 21st of March, 2021. Brandix Apparel Ltd, Dialog Axiata PLC, SLT Mobitel, International Construction Consortium (Pvt) Ltd, Resus Energy PLC, Sysco Labs Sri Lanka, and many other reputed companies collaborated with this massive event. With the contribution of these giants in the corporate world, the event was deemed a huge success. Moreover, a web application with two portals for volunteers and panels was developed to monitor the interviews. The panel could view the details of the interviewees, provide feedback for the interview, and this feedback was sent to the interviewees via email.

It was proven from the positive feedback that participants were able to brush up their skills to meet the standard of their dream career with the help of valuable insights delivered throughout the event. In conclusion, the Rise Up Mora 2021, the latest initiative by the IEEE Student Branch University of Moratuwa, was a great accomplishment and blazed a trail to bridge the gap between university students and the corporate sector.

Way To Wisdom

by IEEE Industrial Applications Society of Sri Lanka Technological Campus



WAY TO WISDOM
CAREER GUIDANCE WORKSHOP

GET KNOWLEDGE ABOUT CAREER OPPORTUNITIES AND PATHS FOR YOUR FIELDS

 Dr. Manoj Ranaweera Senior Lecturer Department of Mechanical Engineering University of Moratuwa MECHATRONICS ENGINEERING	 Dr. Theodoros Madenayake Senior Lecturer Head of DEIT Sri Lanka Technological Campus CIVIL ENGINEERING	 Ms. Buddhini Jayasinghe Operational Startup Manager at Nestle BIO-SYSTEMS ENGINEERING	 Dr. Ajith Pasqual Senior Lecturer Dep. of Electronics and Tele. Engineering University of Moratuwa ELECTRONICS ENGINEERING	 Dr. Dimuthu Pathiraja Lecturer (Probationary) Sri Lanka Technological Campus INFORMATION & COMMUNICATION ENGINEERING
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 REGISTRATION CLOSES ON **6TH** JANUARY 2021

VIA ZOOM

IASSE IEEE SRI LANKA SECTION SLTC

“Way to Wisdom” was a series of virtual workshops to enlighten engineering undergraduates on career opportunities and paths, employer expectations, and ways to reach career goals in every field of engineering degree course available in Sri Lanka Technological Campus. Those engineering fields were Electronics Engineering, Mechatronics Engineering, Civil Engineering, Bio-Systems Engineering, and Information & Communication Engineering. The project was organized by the IEEE Industrial Applications Society of Sri Lanka Technological Campus, focusing on undergraduates of SLTC. Workshops were conducted for each relevant engineering field by experts in the specific field. Workshops were held on 9th and 10th January 2021 via Zoom online meeting platform, and the duration of a workshop was limited to one and half hour time frame.

The project lent an opportunity to all engineering undergraduates in Sri Lanka Technological Campus to grab some ideas on making future career selections wisely and grasp available opportunities in the industry. A detailed overview of employer expectations in each engineering discipline will create competent engineering graduates who will breach every obstacle when they step into the industry.

The first workshop for Bio-Systems Engineering students was conducted by Ms. Buddhini Jayasinghe, the operational startup manager at Nestle. She covered all aspects during the time frame. It was a great help to grab an idea for Bio-Systems Engineering students due to lack of knowledge about their industrial opportunities because this engineering discipline is new to Sri Lanka. The second workshop was aimed at Information & Communication Engineering students. The session was led by Eng. Dimuthu Pathiraja, who is a lecturer (probationary) at Sri Lanka Technological Campus. He delivered vital facts on industrial expectations and what should follow as an Information & Communication Engineering undergraduate. The third session of the series was for Electronics Engineering, which Dr. Ajith Pasqual conducted. He is a senior lecturer in the Department of Electronics and Telecommunication Engineering at the University of Moratuwa. Through his industrial experiences, he delivered an excellent speech on this project's objectives, and he cleared out doubts and answered all questions of the audience. The fourth session of the series was conducted by Dr. Manoj Ranaweera, the director of Quality Assurance Cell/ Faculty of Engineering and a senior lecturer in the Department of Mechanical Engineering at the University of Moratuwa. He also covered all the areas and showed the paths to pursue career goals in the industry and academia. The final workshop was targeting Civil Engineering undergraduates. The guest speaker for this session was Dr. Kushan Wijesundara, a lecturer in the Faculty of Engineering at the University of Peradeniya. He explained how to make carrier selections according to field interests, specially selecting electives in the third year. Also, he covered all the areas attaining the event expectations.

This project aimed to create young elite individuals who are fully fortified with knowledge and guidance to obtain their future career goals. By the received feedback, we are delighted to say that way to wisdom is a great success.

Applying Vehicle Route Optimization to Minimize Transport Inefficiencies in Collecting Farmer’s Perishable Produce

The Vehicle Routing Problem (VRP) is a widely researched area in Operations Research. Researchers applied VRP to fascinating applications such as electric vehicle routing, green vehicle routing, and unmanned aerial vehicle routing, etc. We attempted to apply VRP to minimize transport inefficiencies that happened during collecting vegetables and fruits from the local farmers. It is highlighted that one-third of global Agri production is wasted as Post-Harvest Waste (PHW). As a developing nation, around 40% of our Agri production is wasted as PHW [2]. It has been found that 48% of the PHW is happened due to poor planning of transportation and distribution systems in Sri Lanka [2]. This waste resulted in an approximately 20-billion-rupee loss annually for Sri Lankan agricultural economy and caused plenty of economic and social disputes [2]. Transport experts emphasized that VRP algorithm-based optimization packages lead to achieving significant cost savings in global transportation.

Our model aims to find the optimal route to collect local farmers' perishable produce using a heterogeneous truck fleet, including internal and hired trucks. The model is developed by combining the Close-Open Mixed Vehicle Routing Problem (OCMVRP), Multiple-Depot Vehicle Routing Problem (MDVRP), and Capacitated Vehicle Routing Problem (CVRP) problems. The model aims to minimize the total transportation cost including fixed cost and the fuel cost related to the internal fleet & fixed rent and distance-based rent for the hired fleet under several services and resource constraints. We employed real-world data to test our model. At first, a Greedy algorithm-based heuristic is used to obtain the initial solutions. Subsequently, several local search methods including Guided Local Search (GLS), Simulated Annealing (SA), and Tabu Search (TS) were tested to improve the initial solutions.

We employed several computational experiments using ten different scenarios of real-world case studies to test the effectiveness and the efficiency of our model (i.e., Figure 1. Indicates detailed solutions obtained for 3rd scenario that was tested). The results highlighted that GLS outpe-

erforms in terms of the quality of the solutions and the computation time as indicated in Table 1. and Figure 2. Moreover, statistics proved that the model has achieved more than 80% of the truck capacity utilization while adhering to the best practices of transporting fresh Agri-products. The proposed model contributes to the planning of collecting perishable goods efficiently and cost-effectively since it has incorporated several real-world attributes. As the next step, we attempt to incorporate the nature of perishability for the different product types so that we can track the wastage during transportation. Thereby, we can take necessary proactive measures to minimize the post-harvest wastage of Agri-products during transportation.

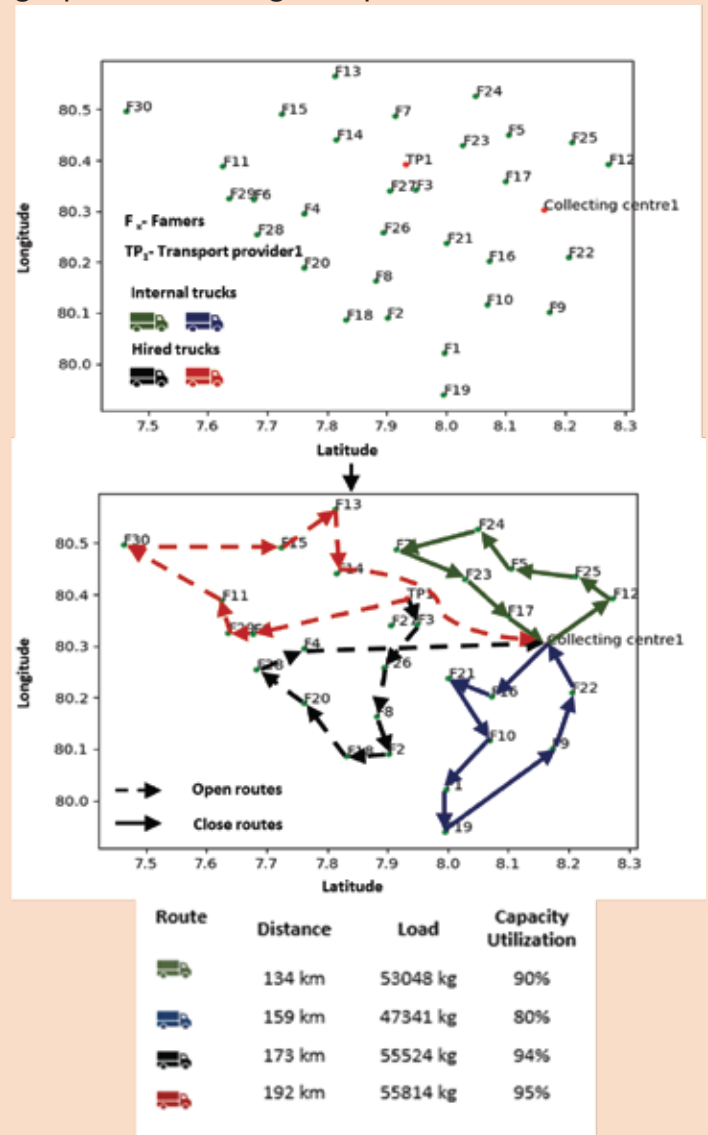


Figure 1. Illustration of detailed solutions for problem instance 3

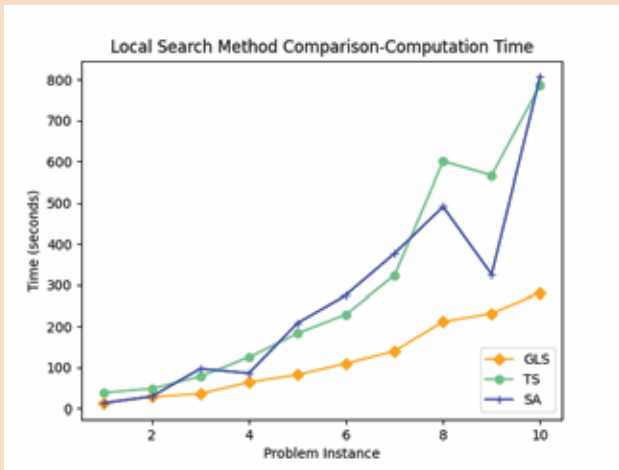


Figure 2. Computation time of different local search methods

Problem instance	Problem Size $F K \bar{R} C H$	Obj. PCA	Obj. GLS	Obj. SA	Obj. TS
1	10 2 0 1 0	52350	52350	52350	52350
2	20 3 0 1 0	86400	86400	86400	86400
3	30 2 2 1 1	112800	98700	112800	98700
4	40 3 3 1 1	149250	133500	149250	133500
5	50 3 3 2 1	180600	171450	180600	173850
6	60 3 3 2 1	273750	217500	273750	225900
7	70 4 4 2 2	357300	293400	357300	290100
8	80 6 6 2 2	372900	354000	372900	355800
9	90 6 6 2 2	411450	373950	411450	375600
10	100 8 8 2 2	485100	428250	485100	452550

Table 2. Solutions for different problem instances
4 Impact within Berth Operations

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Path to Internship'21

by IEEE Student Branch of SLIIT in collaboration with IAS SLIIT , WIE SLIIT

Path to Internship'21 was an initiative to provide undergraduates an exposure and guidance to enter the industrial world. The event was hosted by the IEEE Student Branch of SLIIT in collaboration with Industry Applications Society of SLIIT and the Women in Engineering Affinity Group of SLIIT. This was a 3-day workshop spanning over a month and open to the public.

The event mainly targeted young undergraduates awaiting to begin their Industrial Training. This workshop focused on giving a broad understanding on the importance of having a well-organized CV, facing an interview with confidence and some tips on various challenges and situations that could be faced in a working environment thereby preparing our participants to face their training challenges well ahead.

The reputed professionals that joined hands with us in making this event productive and successful were:

- Prof. Chulantha Kulasekara
- Dr. Nimsiri Abheyawardena
- Eng. Kosala Jayasundara
- Eng. Narmadha Amarasinghe
- Eng. Keerthi Kodithuwakku
- Ms. Induwarani Siriwardane

The event had a total participation of over 800 and many positive and encouraging feedbacks were obtained. The main media of conduct for our webinar was the Zoom Online conferencing platform and the Facebook livestream conducted in collaboration with the Faculty of Engineering Media Club (FEMC). This workshop series was a massive success and recorded high satisfactory registration and participation rate. The student branch hopes to



InnovMind

IEEE Industry Applications Society of Sri Lanka Technological Campus

“InnovMind”, was the latest project launched by the IEEE Industry Applications Society of Sri Lanka Technological Campus (SLTC), to provide a platform for future engineers and innovators to showcase their talents and obtain knowledge on IoT from industry professionals.

The Internet of Things (IoT) was chosen as the main focus of “InnovMind” as it is currently one of the most trending topics worldwide. Living in an age where every industry is leaning towards digitalization, IoT is currently being considered as the bridge between the two worlds.

“InnovMind” was held under four exhilarating phases,

- **Introductory Webinar on IoT**
- **Four-Day Workshop Series**
- **InnovMind | IDEATHON**
- **Panel Discussion**

One of the great achievements of InnovMind is that we have been able to bring together more than 2000 Young Innovators not only from across the country, but from more than 20 countries around the world on a single platform. We were capable obtaining numerous positive feedbacks from both local and international participants.

The Workshop Series on IoT was on held four days covering the areas of “How do I choose the best hardware for my IoT project?”, “Engineering Product Designing Process | Prototyping”, “Software Architecture” and “Cloud IoT”.

Due to the interest and many requests of our valued participants, a Panel Discussion with our valued resource personalities was also organized to clear off all our participants doubts. The panel discussion session was held on 10th of October 2021 as a spinoff for the whole project.

The honorable resource persons for the Introductory Webinar on IoT, the Workshop Series on IoT and the Panel Discussion were as follows,

- **Mr. Ranjan Kulathunga - Senior Design Engineer at Zone 24x7**
- **Mr. Shameera Prajapriya - CEO of Impact IT Solutions, Microsoft Most Valuable Professional (MVP) in Azure**
- **Mr. Thilina Yapa Bandara - Consultant in business solutions at Zone 24x7**
- **Mr. Ushan Chaminda - Lead Explorer and CEO at Gavesha Labs (Pvt) Ltd. Gavesha Labs**
- **Mr. Niroshan Karunarathna - Senior Tech Lead | Embedded Systems at Zone24x7**
- **Mr. Isuru Samarasinghe - Staff Engineer and Cloud Specialist (AWS) at Nagarro (Pvt) Ltd**



InnovMind

IEEE Industry Applications Society of Sri Lanka Technological Campus

The "InnovMind - IDEATHON" was the third phase of the project, and it provided participants with the chance to demonstrate their innovative skills using the knowledge acquired through the InnovMind workshop series. Competitors had to choose one of the following fields and identify a specific problem in that field for which they can provide a creative solution using IoT.

- Healthcare
- Agriculture
- Transport
- Education

The competition's goal was to use IoT to discover a better solution to a problem that has been highlighted from one of those fields. This was the first ever Ideathon launched by SLTC IEEE. InnovMind - IDEATHON received 62 innovative ideas (including 9 international submissions) from both Local and International young innovators.

The submissions were judged by experienced veterans in the field of IoT. The distinguished panel of judges were comprised of,

- **Mr. Ranjan Kulathunga - Senior Design Engineer at Zone 24x7**
- **Mr. Nirosan Karunarathna - Senior Tech Lead - Embedded systems at Zone24x7**

To announce the winners of the InnovMind | IDEATHON and officially conclude InnovMind, the Grand Finale of InnovMind was conducted on the 24th of October 2021. To organize a session to crown the winners of the InnovMind | IDEATHON and inspire all the participants, two high profile dignitaries were invited.

Chief Guest of InnovMind Grand Finale

Ms. Simay Akar - Vice Chairman - Membership, IEEE Student Activities Committee

Special Guest of InnovMind Grand Finale

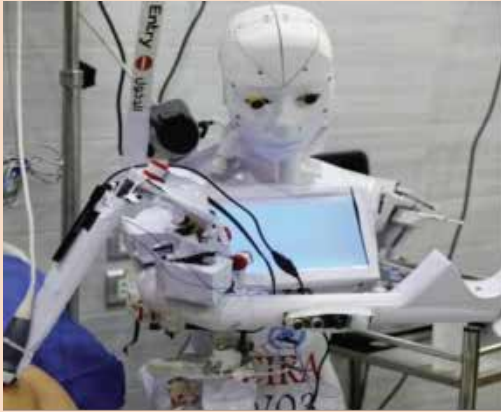
Dr. Chamira Edussooriya - IEEE Executive Committee Member, IEEE EAC Chair, IEEE Sri Lanka Section



InnovMind was able to partner with 2 high reputed companies in Sri Lanka. Zone24x7 and Impact IT Solutions | Gold Partner of Microsoft were the Platinum Sponsor and Gold Sponsor of InnovMind. InnovMind was able to collaborate with 24 Universities in Sri Lanka. A total of 85 undergraduates confirmed their support to the project as official Outreach Partners of the project.

The IEEE Industry Applications Society Student Branch Chapter of Sri Lanka Technological Campus is proud to mention the success of InnovMind. Owing to the modernized concept of InnovMind, the project marked a remarkable reach of 210,234 and was capable of obtaining over 2600 registrations which included over 500+ international registrations. InnovMind was another milestone in the history of projects of IEEE IAS of SLTC which was able to reach new heights.

COVID-19 DIAGNOSTIC TEST ROBOT



1. Introduction

Most probably the medical robots are to treat patients and care them. This type of robot is somewhat different from an ordinary medical robot. A diagnostic test robot will be design to collect samples from the patients or people and test them without any human interaction. Then the test results will be displayed on the display of this robot immediately after the samples are collected.

2. Background and motivation

During current COVID-19 pandemic current situation, the test samples are collected and tested by the humans. The risk of spreading virus among these people are comparably high. It's taking a couple of days to give the test result to the tested person. Within these days there are more possibilities on spreading of virus among neighbours and community. To address this important public health situation by installing a diagnostic test robot that will have an immediate impact on our community.



Figure 2: PCR Test Process in a Clinical Laboratory

3. Methodology

This product is a diagnostic robot to get test samples from patients using swap and do the PCR test using the compatible test machine connected with it. Then the results will be displayed on the display of the robot. The diagnostic test robot is consists

of 3 major components such as holonomic drive with Omni wheels, manipulators with end effector and PCR test machine.

Hardware Analysis

- Compatible PCR Test Machine



Figure3:Compatible PCR Test Machine

- Holonomic drive with Omni wheels
Advantages of selected locomotion methods are robot can achieve sharp turns and move with ease which is a added advantage considering the hospital environment, still able to achieve full force of the wheel and motors, control of the robot is easy and easy to manufacture and assemble

- Robotic manipulator with end effector.
Robotic manipulator is a device which is used to manipulate materials without direct physical contact by the operator. It's created from a sequence of link and joint combinations. Advantage of selecting manipulator is for connecting probes to humans.

- Robotic arm
For a variety of application from the manipulators 3-D printed plastic skeleton parts connected with servomotor in each joints have been selected for Diagnostic Test Robot Design.

- Ultrasonic sensor
- Jetson Nano Microcontroller
- LCD display
- Motor Drive
- Camera Module

Software Analysis

- Machine Learning and Artificial Intelligence
- Convolutional Neural Network
- SLAM technology (Simultaneously Localization and Mapping)

Robot localization is the process of determining where a mobile robot is located with respect to its environment. Mapping in robotics is the procedure of creating a representation of the surrounding environment. For a robot to interact with the environment autonomously it required to perform above mention tasks simultaneously. In SALM a robot use sensory inputs to generate a virtual map of it's surrounding using mathematical algorithms.

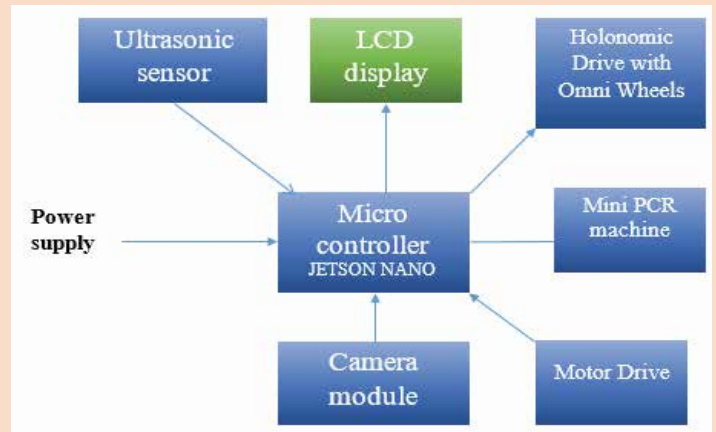


Figure 4:SLAM Technology

4. Scope

When we compared to physical labs with a diagnostic test robot of a specific disease it has high-throughput than commercial labs. In this robots tests can be performed reliably within short period of time. Precise and accurate results by training the model using neural network will brings huge level of success results in medical field by these diagnostic robots. For disinfection process robot also can do by itself therefore no need of human interaction. Because of the major reason for spreading of virus, the human interaction will reduce in this process. General purposes of robots such as quicker to train, cheaper to maintain, easier to refuel and repair, and don't get bored with repetitive tasks which humans can't do also can be achieved by this type of medical robot.

5.Design of Enclosure



6.Target Market

Diagnostic test robots is an innovative concept which has huge market availability within 5 years. There's no any other robots which hasn't designed yet for diagnostic purposes. But in developed countries such as Singapore and China the sample collection robots have been designed and at a testing stage. There are several researches that have been conducted in countries such as Israel about Diagnostic Robotics using Google Cloud.

7. Application

Developed countries are mostly affected and also being affected by Covid-19. In developing countries the deaths have been increased due to the higher speed of spreading of virus. Delay in test results and availability of number of tests per day are the two major reasons for this crisis situation around the world. This type of robot can be quicker to access to people around the world using real time internet access which is an additional feature for Public Health Informatics. People also can have a diagnostic test robot for residential purposes in individual houses and apartments. Development of Health Care Industry around the world can be another additional benefit as well.

Article by,
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SLIIT Xtreme Programming competition

by IEEE Computer Society Chapter of Sri Lanka Institute of Information Technology



SLIIT Xtreme Programming competition was introduced by the IEEE Computer Society of Sri Lanka Institute of Information Technology (SLIIT) in collaboration with the Software engineering Student Community of SLIIT to introduce students to competitive programming and encourage them to participate in IEEE Xtreme which is a flagship event of IEEE. This event took place on the 25th of September and was very similar to IEEE Xtreme. This event was a 12-hour event and was hosted online this year.

This event consisted of a series of webinars to introduce the participants to what competitive programming is, how to participate in such events and how to work in teams to solve programming problems. Dr. Nuwan Kodagoda, the head of Computer Science and Software Engineering at SLIIT, gave the students an introduction to what competitive programming is and how it can be important for one's career.

The next session was conducted by Dr. Shyam Reyal, who is a senior lecturer of the faculty of computing at SLIIT. This session was very informative, and it discussed his personal experiences with competitive programming, his training techniques on various competitions and how to face competitions. Finally, the webinar was concluded by the Speech of Kavindu Dulanjana Perera, the Chairman of IEEE Computer Society at SLIIT and ambassador of IEEE Xtreme at SLIIT.

The competition commenced at 8.00 a.m. with the participation of over 120 teams. The participants were monitored regularly by the proctors and continuously guided by the organizing committee to face any technical difficulties during the competition. The participants were given the opportunity communicate with their teammates on private channels but were monitored live during the time of their participation. The results were displayed in real time on the SLIIT Xtreme website throughout the completion of the event at 8.00 p.m. by the congratulatory speech by Dr. Shyam Reyal. Overall, the competition was a huge success, and all participants received a valuable experience on how to face IEEE Xtreme and other programming competitions



3 ways in which Decentralized Systems are not Decentralized Systems

How labels deceive

Decentralization is touted as a key advantage of most decentralized systems.

For example, a crypto-currency built upon a block-chain-based distributed ledger is “decentralized”. In contrast, the national monetary system controlled by a central bank is “centralized”. The decentralization in the former might be considered an advantage over the latter because members are protected from arbitrary monetary policy (e.g. controlling money supply) by a central authority (e.g. a central bank).

One problem with arguments like this is that the term “decentralization” is vague. What does decentralization mean? Is “decentralization” a binary yes/no, a more nuanced property? How Decentralized are Decentralized systems?

Any information system, centralized or decentralized, is fundamentally a system that processes data. Every moment new data is added and processed. Centralization (and decentralization) measures how unequal (or equal) the power to process data is distributed.

For example, suppose you “clap” on this article. Medium will increment some counter in its backend, and display that value at the bottom of this article. Of the three parties involved (you, me and Medium), we all have varying amounts of power to process data, but one (Medium) has a lot more power. Hence, Medium is a centralized system. Medium could even decide not to count your like (e.g. if you are not logged into Medium or fail a Captcha, and Medium considers you some fake bot).

In contrast, let’s suppose Medium was more **decentralized**.

For example, suppose I had the power to process any data associated with my articles. If you posted an unfavourable comment below this article (say, accusing me of plagiarism), then I might delete it.

You might argue that this is unfair, but that is not the point. Decentralization is not about fairness. It is about the distribution of power.

So, how Decentralized are Decentralized systems?

Let us consider a decentralized system like BitCoin. How decentralized is BitCoin? Or, more definitionally, **how equal is the distribution of power to process data across members?**

There are **at least three ways** “decentralized” systems (BitCoin included) might not be decentralized:

1. Initial Powers. The algorithm’s initial state determines a large part of how data in a decentralized system is processed. Hence, the writers of this initial code have more power over the system than those who join later. You might say that those who join know about this and that the initial writers cannot modify the algorithm to suit them. True, but not my point. The system still favours whoever favours the initial state. If you don’t like it, you have no choice but to join some other system or none at all.

2. External Powers. In theory, it is possible to “take over” a decentralized system by (say) taking over a majority of its member nodes. In practice, this is made difficult by computational barriers (e.g. proof of work), but it is by no means impossible. If a really big external power (e.g. a powerful and tech-savvy state) wanted to take over a decentralized system, few would be able to resist. Hence, power in a decentralized system mirrors the power of the “real world” outside it. Hence, if the “real world” is unequal, any decentralized systems will eventually converge to centralization.

3. Internal Powers. While a cryptocurrency like BitCoin is independent of the US Federal Reserve, one can easily convert BitCoin into US Dollars and, for that matter, most other currencies. Hence, anyone who is BitCoin rich is Dollar rich, and vice versa. And anyone who is Dollar Rich has a greater ability to influence others in the decentralized syst-

system and potentially even take it over. Hence, just as External actors can effectively “centralize” the decentralized, so can internal actors.

Hence, we might be too quick to “buy” the “decentralized” argument. We might be reading too much into a single word.

Note, my point is not to say that decentralized systems are completely worthless; quite the opposite. We are more likely to make the best use of decentralized systems, if we see them for what they really are.

Labels can deceive...

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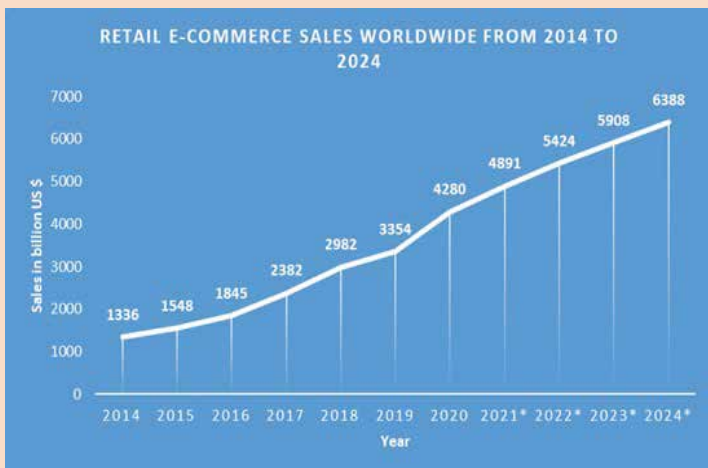
**2021 Outstanding Section Membership
Recruitment and Retention Performance**

Sri Lanka Section

A vertical advertisement for IEEE students. The background is dark blue with a network of glowing nodes and lines. At the top, the text 'IEEE students' is written in a large, white, sans-serif font. Below that, 'YOUR STUDENT DISCOUNT JUST GOT DISCOUNTED.' is written in a bold, white, distressed font. Underneath, it says 'Save 50% on student membership with this code:' in a smaller white font. A yellow banner with the code 'FUTURE50' in purple, bold, sans-serif font is positioned over a man's shoulder. The man has a surprised expression, with wide eyes and an open mouth, and is pointing upwards with his right index finger. At the bottom, the IEEE logo and the word 'IEEE' in white, bold, sans-serif font are displayed on a dark blue background.

E-commerce Returns Management; A Timely Dilemma

e-commerce is an immensely growing industry due to the large selection they offer, transparency of prices across retailers, availability of discounts, and rising internet penetration in the world. Statista (2021) showed a 228% growth in retail e-commerce sales worldwide in the period between 2014-2020. Specially, COVID-19 crisis further advanced this growth with the aid of booming digital economy. As people around the globe entered into social distancing practices limiting their travel, online shopping became a more attractive option than ever. NielsenIQ data states that 67% of consumers have expressed, they shop differently now as a result of COVID-19 [2]



With this rapid expansion, the supply chain related to e-commerce industry gets more complicated. Along the way, making things more complex, the e-commerce sales growth is accompanied by a high rate of returns, which is around 30% [3]. Customers mistakenly ordering incorrect product or size, ordered product failing to meet customer expectations and sudden changes in customer needs can be mentioned as few instances where returns can occur.

Therefore, it is evident that returns management is an important aspect of reverse logistics operations for an e-commerce firm under the current context. Rogers et al. (2002) stated "Returns management is defined as the process by which activities associated with returns, gatekeeping, and avoidance that are managed within the firm and across key members of the supply chain". Returns management is no longer an optional aspect for e-commerce firms with the mentioned alarming rate of returns. Factors such as, environmental concerns and

customer awareness have led to increase buzz around effective returns management.

However, still many e-commerce firms around the world pay less attention to returns management treating it as a burden. In Sri Lankan context, most e-commerce firms tend to replace the returned product with a new one but does not carry the returned product in their reverse logistics. Due to this, faulty products are being thrown into landfills by consumers, creating major environmental concerns. Moreover, this hinders product repairing, refurbishing, remanufacturing and recycling activities, avoiding cost saving opportunities which are also critical in stepping towards a more sustainable world.

e-commerce firms in current context, need to be diligent with monitoring returns management process, in order to avoid large monetary losses. Also, it is important to have the ability to track and assess the value of a returned product [5]. Actions need to be taken in order to identify potential refurbishing, repurposing opportunities to realize value back into the firm. Furthermore, an effective returns management process coupled with good supplier relationships, can reduce losses by using undamaged returned items to restock warehouse inventory.

As another advantage, studies have proved that the effective returns management can result in improved customer loyalty which is beneficial for a firm in a competitive industry [6]–[8]. A good return policy adds a new layer of transparency to the firm, attracting more customers. It also aids in attracting more sellers into the e-commerce firm, due to minimal conflicts/disputes that can arise between two parties regarding returns management.

Sustainable returns management can be utilized as a part of unique selling proposition in an e-commerce firm. Intelligent customers nowadays are well aware of corporate social responsibility, thus make purchases based on the ethical behavior of a business and its efforts towards sustainability. A study conducted on fashion retail industry revealed that 32% of customers are willing to pay a higher price on products from brands which are committed

committed to sustainability [9]. Therefore, it is evident that being sustainable in firm's returns management process and showcasing that in firm's return policy can attract more customers.

There are many reasons behind most firms treating return management as a burden. Lack of integration in forward and reverse logistics in their operations can be identified as a major drawback in these firms. Treating reverse logistics in return management separately can incur a huge cost for a firm. Therefore, Integration of both forward and reverse logistics, while planning routes with returns in mind can actually lead to huge cost savings for the firm. Recently, software solution providers are focusing on giving solutions that aid tackling efficient and sustainable returns management. Industry solutions such as 'Happy Returns' by PayPal; 'Loop Returns', and 'Returned Merchandise Authorization' (RMA) in Magento open-source e-commerce platform can be mentioned as few examples [10].

In summary, returns management is becoming a critical aspect of any e-commerce firm. Therefore, putting substantial efforts to establish proper systems and processes for returns management will lead to gain competitive advantages. Improved customer satisfaction and loyalty, increased profit margins via repair, refurbish, reuse which reduces the need to purchase new products are few instances in realizing a competitive edge. Most importantly, effective returns management in e-commerce industry will be a much-needed step towards relishing a more sustainable world.

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CYBER LAWS

by Women in Engineering Affinity Group of IEEE Student Branch of SLIIT

Women in Engineering (WIE) Affinity Group of IEEE Student Branch of SLIIT organized CYBER LAWS as an open event for all the Cyber Security Enthusiasts. CYBER LAWS is a new event that came out as a result of the requests of the student community. The event was an interactive session for all the participants in an era with the rise of social media and online connections in their daily lives. At Present, cyber violence has expanded, making some of the users face hard situations. Therefore, educating ourselves about each situation and being aware of how to react and what kind of actions we should take to face such situations, especially in Sri Lanka. The event was held as an awareness session focused on raising the awareness of young undergraduates on cyber laws, cyber security, and their significance.

The event was immensely successful in focusing on the participants who have faced challenges and who are willing to know the precautionary steps to overcome the challenges in the current cyber climate. The session was conducted as a webinar and the keynote speaker gave a positive influence on the participants according to the objectives of the organizing committee.

Some of the goals of Cyber Laws were,

- To explain the significance of cyber laws.
To raise awareness on cyberbullying.
- To explain the current status and the future of Cyber Laws in Sri Lanka.
- To create more awareness about cyber legal issues and challenges.
- To provide advice, inputs as also guidance to young undergraduates on their legal issues concerning the use of cyberspace.



Cyber Laws was an island-wide webinar. Therefore, the webinar announcing process was quite a challenge for the Publicity team. As a result, Cyber Laws were brought to the attention of the targeted crowd with a successful and the most convenient legal professional. We shared the posts of the event via social media, and we could gather a considerable number of participants during the session.

The session was conducted by a legal professional with amazing visionaries and also with various achievements. The keynote speaker who joined hands with Cyber Laws was,

Ms. Kanchanamala Geekiyanage

(LL.B.(Hons)(Col), LL.M.(Col), CIMA – the UK, Attorney-at-Law with 17 years of experience, Visiting Lecturer of Law of University of Colombo, KDU, SLIIT, Guest Lecturer of Sheffield Hallam University, Associate Lecturer of Curtin University – Western Australia)

CYBER LAWS

by Women in Engineering Affinity Group of IEEE Student Branch of SLIIT

The event was conducted via an online platform on 28th November 2021 due to the current pandemic situation COVID 19. The keynote speaker Ms. Kanchanamala Geekiyanage conducted the awareness session by explaining what cyber laws are and the purpose of implementing them in society. Furthermore, highlighted the different types of Cyber Laws, the Current Status of Cyber Laws in Sri Lanka, Cyber Bullying, and the Future of Cyber Laws with lots of important facts that are useful for the participants.

Finally, during the Q and A session, all the participants could clear their doubts before concluding the webinar. Feedback forms were given to the participants to make improvements for future events done by WIE. Afterward, the session was brought to a close with an amazing final group photo with the participants.

The event was successfully concluded with appreciated comments of the participants and the webinar was specifically conducted interactively among participants and the speaker. The feedback obtained from the participants showed that the overall objectives of this webinar were achieved. The expected participation was overall an immense success and this rare opportunity of sharing the professional experiences of the speaker with examples was able to build confidence and faith, among all the participants. Under the guidance of seniors and group advisors, the event concluded successfully, with many requests to continue the webinar annually with professionals.

IEEE OPEN DAY 2021

by IEEE Student Branch of University Of Moratuwa



Each year, the IEEE Student Branch of the University of Moratuwa marks the beginning of the term with the iconic event, IEEE Open Day, which is the annual IEEE awareness day, and the recruitment of newbies for the student branch. This year, Open Day themed to the famous series “Money Heist” was embellished with an array of activities, including guest lectures, fun games, entertainment sessions, and skill development workshops. The event took place on an entirely virtual platform via zoom on 9th October from 6.00 pm onwards

The main target group of IEEE Open Day 2021 was the 20th batch in order to create awareness about IEEE. Prior to the event, a series of flyers sharing the volunteering experience with IEEE of some of our previous remarkable volunteers were posted, inspiring the newbies to embark on their volunteering journey with IEEE.

IEEE OPEN DAY 2021

by IEEE Student Branch of University Of Moratuwa

The marketing campaign, which highlighted the theme of the Open Day, awake the curiosity among the newbies about this ultimate extravaganza, attracting more than 300 passionate newbies, out of which more than 150 newbies took part on the IEEE Open Day.

Mr. Chamika Sudusinghe, the student representative of IEEE Sri Lanka Section for the term 21/22, graced the IEEE Open Day as the guest speaker. Mr. Chamika being a powerhouse who bestowed with his utmost enthusiasm to continue the legacy of IEEE, built a discussion about the IEEE global platform and how to utilize that to polish our personal and professional skills. Moreover, Ms. Awishka Thuduwege, an energetic and well-known member of the student branch who was also the former secretary, enlightened the evening with her wonderful volunteering journey. Walking down her journey was indeed influential for all the newbies who took part in the session.

IEEE Open Day is one of the most anticipated events in the student branch calendar. Although the event was held virtually, the Organizing committee made sure to bring the same energy with the same excitement. The session lineup included fun games and entertainment to create an extraordinary experience, unlike the typical virtual events. The escape room challenge drew the attention of the newbies especially as it consisted of several riddles aligned with the theme, Money Heist. Winners who could puzzle out the challenges were awarded valuable prizes for their riddle-solving skills. Afterward, the fun-filled evening was made more vibrant with mesmerizing performances by the guest artists. The Voice Sri Lanka contestants, Nawanjana and Tiney astonished the audience with their mellifluous voices and dazzling musical brilliance.

Learn and Lead was conducted as a follow-up program of IEEE Open Day 2021, aiming to brush up the soft skills of volunteers wishing to kickstart their volunteering journey with IEEE.

This was held for about a month, covering some of the most sought-after fields in today's world like graphic designing, video editing, content writing, web designing, compering, and event hosting. All the sessions were conducted by experts in the student branch for the respective field.

IEEE Open Day'21 helped to a great extent in creating awareness towards IEEE Student Branch among the newbies and encouraging them to grab the opportunities available with IEEE to climb up the ladder of IEEE in the future, which were the main objectives of this event. In addition to achieving the main goals of this event, IEEE Open Day'21 was a spellbinding escape for all the newbies who were tired of their tight academic schedules. In conclusion, IEEE Open Day has been deemed a huge success, bringing together the enthusiastic young community of the University of Moratuwa, getting them onboard with IEEE Student Branch, and guiding them to develop their skills through volunteering with IEEE.



IEEE Signal Processing Society Sri Lanka Chapter

The formation of IEEE signal processing society Sri Lanka chapter was approved on 8th August 2021. The Annual General Meeting of the IEEE Signal Processing Society Sri Lanka Chapter was held on the 6th October 2021.

The details of Executive Committee is given below

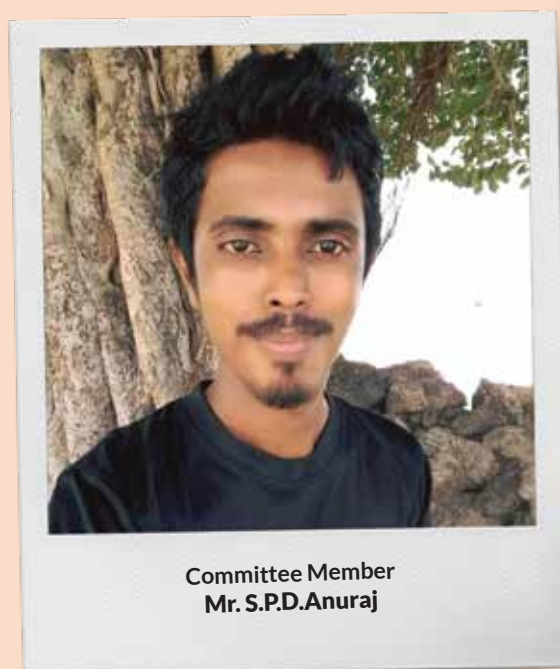
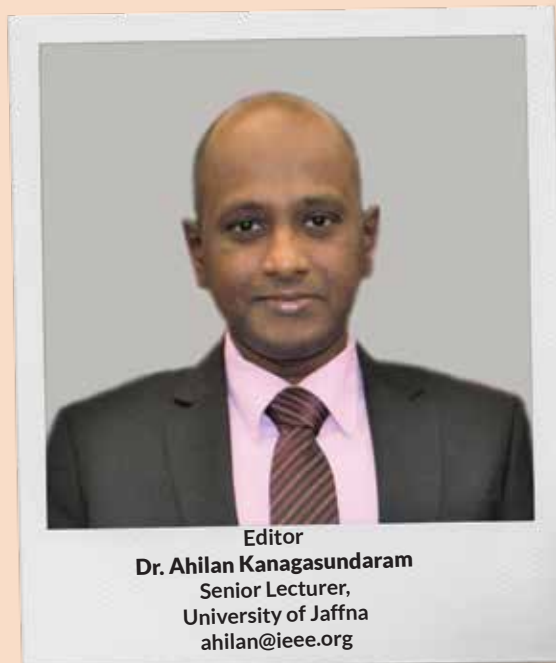
Chair	Dr. Chamira U. S. Edussooriya
Secretary	Dr. Uditha Wijewardhana
Vice Chair	Dr. Chatura Seneviratne
Treasurer	Dr. Ahilan Kanagasundaram

General committee

Assistant Secretary	Dr. Maheshi Dissanayake
Editor	Dr. Samiru Gayan
Industry Coordinator	Mr. Sahan Hemachandra
Student Coordinator	Dr. Chamanthi Karunasekara
Event Coordinator Secretary	Mr. Pasan Maduranga
Web Admin	Dr. Vidura Jayasooriya

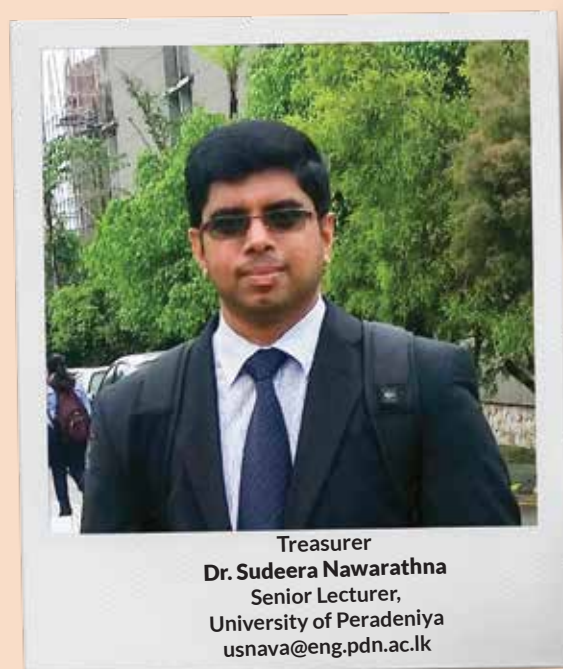
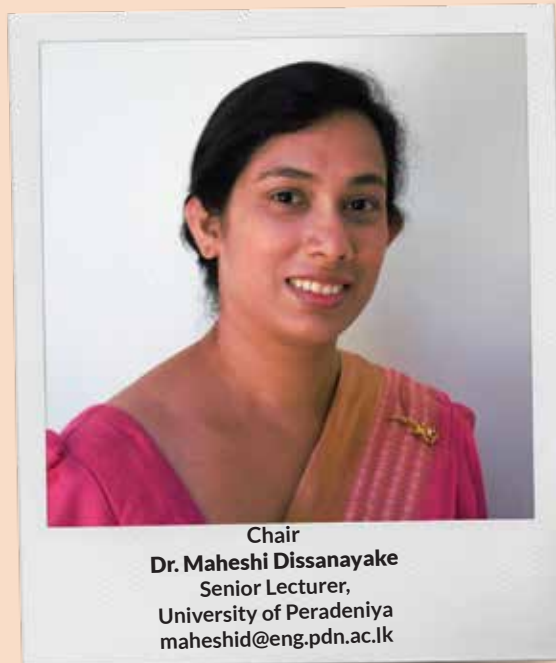
Thank You!

IEEE Sri Lanka Section Editorial Committee 2021



Thank You!

IEEE Sri Lanka Section Executive Committee 2021



Thank You!

Committee Members



Thank You!

