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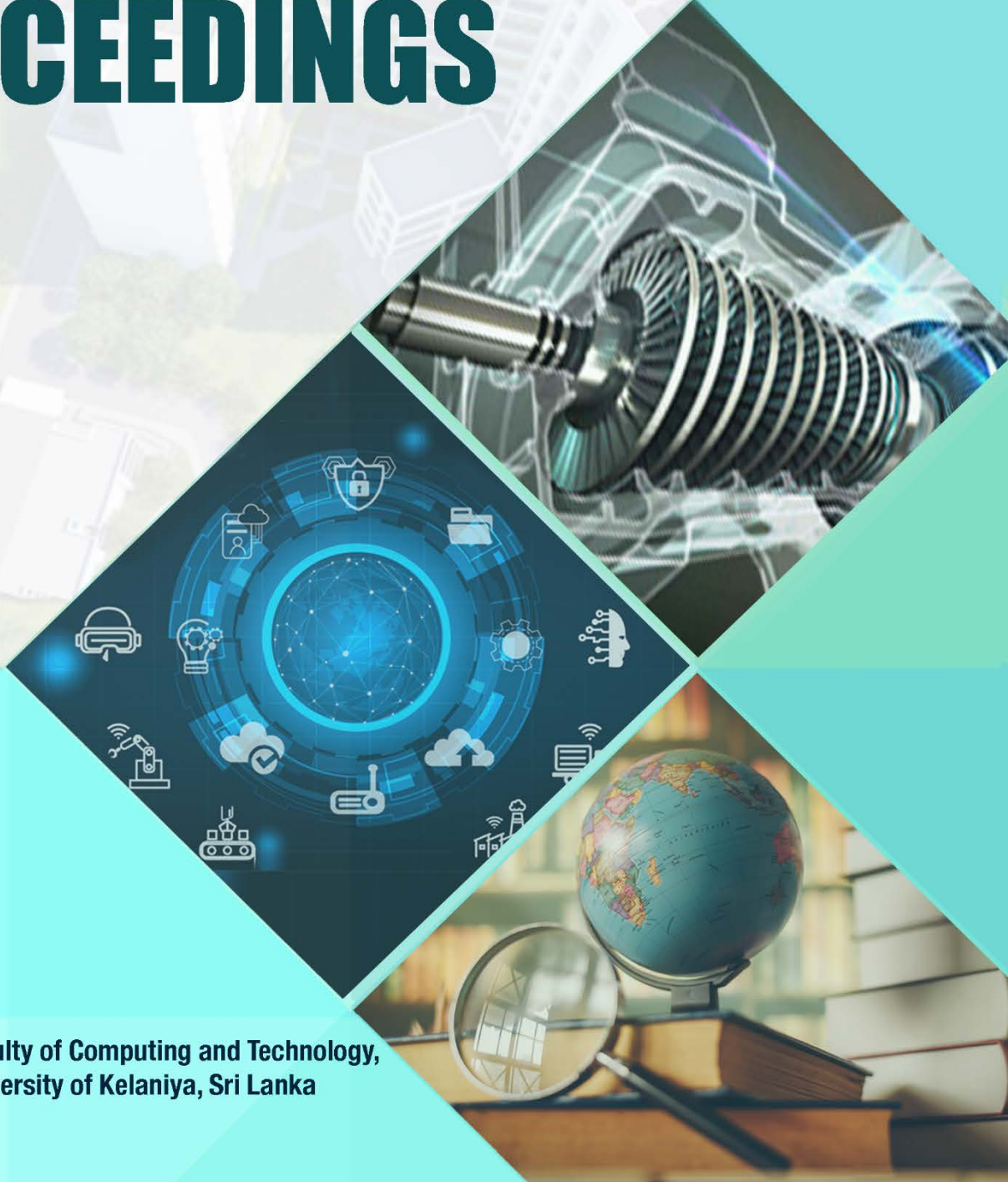
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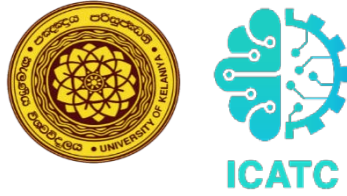
**FCT-FRS 2021**

**STUDENT RESEARCH SYMPOSIUM**

**PROCEEDINGS**



**Faculty of Computing and Technology,  
University of Kelaniya, Sri Lanka**



*“DEFINING THE ROLE OF TECHNOLOGY FOR ECONOMIC DEVELOPMENT OF A  
COUNTRY”*

**Proceedings of the Student Symposium  
(ICATC – 2021)**

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## Message from the Dean of the Faculty of Computing and Technology



It is an honor to write this message for the International Conference on Advances in Computing and Technology 2021 (ICACT 2021) as the Dean of the Faculty of Computing and Technology, University of Kelaniya, Sri Lanka. Technology invades our day-to-day lives. The COVID-19 pandemic has catalyzed the adoption of technology into day-to-day activities of the citizens around the Globe. A special attention should be given to the technology-based food supply chain, health, and education of every citizen. This is an opportunity for innovations with lot of challenges which need to be discussed and argued enough to ensure the health and safety of individuals, and to identify the social and cultural impact. The opportunities come infrequently with challenge. It is the duty of the research and development community to identify the opportunities immediately and grab them for innovations for the betterment of each member of the society. I am sure that ICACT 2021 has opened a wide discussion forum for the researchers and other stakeholders from different geographical locations to meet virtually and have a fruitful discussion in line with the conference theme “Defining the role of Technology for Economic Development of a Country”. I am also sure that the keynote speaker Professor Saman Bandara will provide the insight into the theme of the conference ICACT 2021 and set the stage for the three conference tracks of the ICACT2021.

The three additions to the ICACT 2021: The Faculty Research Symposium, Pitch 90 and Workshop target the postgraduate, undergraduate and school student communities. These open room for student community to listen to and work with experts in the respective fields and learn. We believe that these new additions will have a significant impact on student research development work. Hope that ICACT 2021 will help the faculty to produce right human resources for the socio-economic development of the county by producing at right time.

I take this opportunity to wish all the best for all the presenters and the researchers.

**Dr. Gamini Wijayarathna**

DrEng (Electro-Communications, Japan)

MEng (Electro-Communications, Japan), BSc (Kelaniya, Sri Lanka)



## Message from the Director of Research Center



It is my pleasure to word a message to the first Research Symposium of the Faculty of Computing and Technology at the University of Kelaniya (FCT of UoK). The research symposium will highlight the contributions of the first batch of undergraduate and post-graduate students as they complete their academic programmes.

The research symposium will be an intellectually stimulating forum. Forums such as these are an integral part of any academic community especially one which is in a national University. Through hosting such a forum, the academic community opens its doors to the outside world to share their intellectual contributions and receive feedback from the community beyond its gates. It stimulates the sharing of ideas and igniting of collaborations, which will continue to further the boundaries of knowledge.

At the Faculty of Computing and Technology, a problem-solving culture is promoted throughout its academic programmes. The vision of the academic programmes at the FCT of UoK is to prepare graduates who are capable of deploying knowledge and skills constructed in their academic training to solve real-world problems. To realize this grand vision, the academic programmes at FCT of UoK are delivered in a project based learner centered pedagogy which stimulates inquiry, collaboration and creativity. Mini-projects from real-world situations that are either of social importance or of value to the industrial sector are incorporated in to most of the courses. At FCT of UoK we bring the real-world in to the lecture halls to ensure that the students receive an authentic learning experience.

It was my pleasure to be one of the coordinators of the final year projects of the first undergraduates of the FCT at UoK. They are our first stepping-stone in the endeavor of building an academic community that is aware and capable to utilize their academic training for the betterment of the community outside of the walls of the University. The Research Symposium will be an excellent arena for the graduates to showcase their final year projects addressing the technology related issues faced by the society and the industry.

I take this opportunity to wish all our young graduates an excellent professional and academic career and hope that they will contribute to the betterment of the society as well as to further the frontiers of human knowledge.

**Dr. Laalitha S. I. Liyanage**

Director of the Research Center at FCT of UoK

## **Message from the General Chair of ICATC-2021**



It is a great pleasure to issue this message on the occasion of the 6<sup>th</sup> Annual Conference on Advancement of Technology and Computing to be held on 18<sup>th</sup> to 20<sup>th</sup> of December 2021.

This event is organized by the faculty of computing and technology of University of Kelaniya, Sri Lanka under the guidance of the Vice Chancellor, University Research Council, the Faculty Research Centre and Faculty Board led by the Dean of the Faculty.

Kelaniya University is one of the few universities in Sri Lanka admitting students to the technology stream. It is expected to give more emphasis for the practical aspects in this course of study.

Application of technology is vital for the development of every aspect of the economy of a developing country like Sri Lanka.

Mere application of technology will not eradicate the practical obstacles in encountered in achieving the desired goal objective. Hence research plays a pivotal role.

It is expected that collaborative work will be facilitated through this conference leading to synergy, which will make the outcome of this event a great success.

As the general chair, I wish and hope that all these expectations to be reality!

**Kasun Fernando, PhD**

General Chair, ICATC-2021

## **Conference Tracks**

### **Track A:**

Advancements in Applications of Engineering and Science in Technology

### **Track B:**

Advancements in Applications of Technology in Teaching and Learning

### **Track C:**

Advancements in Applications of Computing Technology

## Sustainable Optimization of an Assembled Product using LCA

M.W.S.Wijerathne, D.B.P.L.P.Bandara, B.A.D.M.Hansani, N.D.H.W.Silva, R.L.Peiris\*

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### ABSTRACT

*Index No: ES-01-05*

Currently, industries come up with Assembled Product Optimization which is totally or partially relying on economic and social aspects rather than environmental aspects. It tends to avoid identifying hidden and massive impacts to the environment by manufacturing products. The total composition of three pillars; economic, social and environmental can affect achieving sustainable product optimization [1]. The importance of pillars of sustainability will be demonstrated through the Life Cycle Assessment (LCA) technique to produce a sustainable product such as a wardrobe of a modern residential apartment is optimized [2]. Enhancing its product development factors will be affected towards the optimization while exposing the hidden environmental impacts [3]. By redesigning the associated wardrobe through changes of specifications, raw material and dimensions, best-optimized designs will be selected in which best-optimized cases of enhanced product qualities than the reference wardrobe design. Furthermore, to guide real furniture manufacturers for this optimization approach, a manufacturer guideline will be prepared as the ultimate deliverable or the output of this study which can be recognized as a strategic product optimization plan which will act as a milestone in sustainable product optimization strategy.

**Keywords:** *Life Cycle Assessment, Sustainable product optimization, Product development*

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## Towards Developing a Household Washing Liquid for the Effective Removal of Pesticides Residues in Vegetables and Fruits Using Natural Substances

Manjali Embogama<sup>1</sup>, Harshani Wickckramaarachchi<sup>2</sup>, Nimesha Sonalee<sup>3</sup>, Tharindu Rukmal<sup>4</sup>, Thilini Rupasinghe\*

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### ABSTRACT

Index No: ES-02-09

Pesticides are chemical or biological agents that are used in agriculture to minimize plant diseases, pests and weeds. In the current Sri Lankan context, commercial production of fruits and vegetables is extremely dependent on the regular usage of pesticides. Farmers tend to use pesticides more than the recommended amounts to achieve higher harvest [1, 2]. As a consequence, excessive pesticides residues have been detected on the surface of the vegetables available in the Sri Lankan market. According to literature, accumulated pesticide residues in food products have been associated with a wide variety of human health hazards [1,3]. Hence, it is significantly important to remove pesticide residues before consumption. Current practice in most of the households in Sri Lanka is washing vegetables and fruits using tap/well water to remove pesticides. However, using tap water is not an effective method as it is not sufficient to remove pesticide residues. Hence, this study focuses on developing a bio safe, effective and easily applicable washing liquid to remove pesticide residues using natural substances. Chlorpyrifos which is one of the mostly used pesticides in Sri Lanka, was selected as the model pesticide and the removal efficiency of this pesticide by natural substances such as vinegar, lime, turmeric and tamarind was investigated using computational simulations. The main hypothesis was that the efficiency of removal would depend on the interaction between the biogenic substance and Chlorpyrifos [4]. Therefore, in the computational study the interaction that could occur between the active chemical of the biogenic substance and Chlorpyrifos was predicted and the Spartan software was used to obtain information about structure, relative stabilities, and properties of the predicted product. Further, the potential energy of bond between acid substances and chlorpyrifos was also calculated. The stability of the product formed between Chlorpyrifos and citric acid (lime) resulted to be -948.98 kJ / mol while that of curcumin (turmeric) and acetic acid (vinegar) resulted to be -472.69 kJ / mol, -286.73 kJ / mol respectively. According to the hypothesis, citric acid can be named as the most suitable candidate as it results in a product with the lowest potential energy. Overall, the results from the theoretical study provides a good basis for the selection of natural substances for future laboratory studies to develop a washing liquid with a higher efficiency.

**Keywords:** *Pesticide residues, Fruits, Vegetables, Chlorpyrifos, Health, Biogenic substance*

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## Development of Low-Cost Efficient Device/ Method to Utilize Groundwater Resource for Cultivation in Sri Lanka

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### ABSTRACT

*Index No: ES-03-14*

Plant earth is covered with water than land. Percentage wise it is 97% of oceans and 3% of freshwater. Freshwater is again separated as 79% of ice and glaciers, 29% of groundwater and, 1% surface water. Sri Lanka is a tropical country where it receives an average rainfall of 2000 mm annually [1]. The Northern part of Sri Lanka is recognized as the dry zone of the country based on annual rainfall records and it solely depend on the rain and ground water while the other parts depend on man-made tanks, canals etc. [1].

In general practice, electrical and fuel pumps are used to bring groundwater to the surface. However, such pumps are associated with key drawbacks such as high initial cost and higher maintenance cost. [2]. In that context, there is an urgent need to find an alternative for electrical and fuel pumps. Use of windmill water pumps are considered as one of the cheapest methods to pump ground water to the surface. Moreover, this method is environmentally friendly and therefore named as an effective alternative for electrical and fuel pumps. Nevertheless, this technique is rarely used for water utilization. In this study, a 1:10 scale water windmill was developed using mostly reusable materials. It was comparatively low-cost device to utilize this readily available energy source. The model designed is able to collect and distribute water utilizing the gravity. A feasibility study identified Jaffna peninsula of northern of Sri Lanka as the best location based on the requirement of water and the availability of groundwater for cultivation purposes. More in depth work on the use of windmill could provide farmers in Northern Sri Lanka a method to be sustained through ground water rather than depending on rain water.

**Keywords:** *Rainfall, Windmill, Utilization*

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## Evaluation of Growth Performance on Newly Developed Slip Form Vertical Growing Panels

Krishani R. Jayasingha<sup>1</sup>, D.G. Jinali P. Dayarathne<sup>1</sup>, K.H.G. Pasindu Tharanga<sup>1</sup>,  
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### ABSTRACT

Index No: ES-04-16

Greenery and sustainability are playing an important role, as today's world tends to tackle the global warming. Green environments tend to reduce the negative impact of global warming, preserve precious natural resources and improve the quality of lifestyle [1]. The act of greening generally involves incorporating more environment friendly systems into one's environment such as home, workplaces, and public places. External green wall cultivation is one of the main structural components, which is used in green building designs/ greenery environments. It is part of an integrated solution for sick building syndrome problems. The present study focuses on the evaluation of growth performance of *Centella asiatica* (Gotukola) plants, *Rhoeo spathacea* (Boat Lily), and *Hedera helix* (English Ivy) on newly developed slip form vertical growing panels. It aims to find an innovative method to address the drawbacks of existing green walls, such as wash off of plant nutrients during irrigation and the potential of causing damages to the cultivated walls etc. Slip form vertical growing wall panels were prepared as described in literature using three different sustainable homogenous mixtures that were reinforced with three different weights of alkaline hydrogen peroxide pretreated coir fibers [2]. In addition, growth parameters of plant height, leaf area, and number of leaves per plants were measured for the selected crops, which were grown in prepared slip form panels (fig.1). The average leaf area of Gotukola, Rhoeo, and English Ivy varied between 4.13 cm<sup>2</sup>-5.3cm<sup>2</sup>, 14.45-20.28cm<sup>2</sup> and 9.71-14.07cm<sup>2</sup> respectively. Further, there was no significant variation in the leaf area of cultivated crops grown in the three different wall panels after 7 weeks. Similar variations were observed in the readings of average number of leaves per plant and plant height. Thus, the comparison of variations of growth parameters indicates that the all three different wallpanels could be used for preparation of vertical growing panels while the most suitable wall panels were selected through cost analysis.



Fig 1: Prepared Slip Form Wall Panels. (a) before cultivation, (b, c, d) after cultivation

**Keywords:** Growth parameters, Slip form panels, Vertical growing

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## Design of Effective Shading Devices for Sri Lankan Residential Buildings

Thilini Chithrananda<sup>1</sup>, Madhushani Thakshila<sup>2</sup>, Vishwani Lakmali<sup>3</sup>, Sadeesha Abeygunawardhana<sup>4</sup>, Amila Jeewandara<sup>5</sup>,  
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### ABSTRACT

Index No: ES-05-17

According to international and national standards, new buildings are constructed to maintain high energy efficiency from both active and passive perspective, as well as excellent indoor environmental conditions. Electricity consumption accounts for the majority of energy consumption in homes for HVAC (Heat Ventilation and Air Condition). The HVAC load could be minimized by avoiding the heat gain inside the house. There have been several approaches adopted to prevent heat gain [1]. Developing an efficient external shading device will help minimize the amount of heat gained from the sun rays that fall into the building. However, there are no standard guidelines or standards in the Sri Lankan context for shading devices. Hence, this study aims to provide a set of standards, including the dimensions needed to establish appropriate shading devices for Sri Lankan residential buildings. The orientation, climate, and sun path for a particular location needs to be studied to obtain the sun angle. The sun angles, which are the azimuth and the altitude, are the key factors used to calculate the dimensions for an effective shading device.[2]. The calculations for shading device dimensions were carried out for all twenty-five districts in Sri Lanka for a number of standard window sizes that are being used in residential buildings. The shading lengths depend on the direction or the orientation of the window. The east and west-facing windows get the direct sunlight. Therefore, placing shading devices on those will not be effective compared to the windows oriented to north and south directions [3]. Hence, the lengths of the vertical and horizontal shading devices were calculated for the windows facing to north and south directions. Calculated dimensions were verified by using AutoCAD software. Thermal comfort and the cooling load of the building was determined using the Revit software by Autodesk.

Findings of this study show that the horizontal and vertical shading device lengths obtained for north-oriented windows are lower than the lengths obtained for south-oriented windows. This can be attributed to the higher altitude, and lower azimuth on the north side compared to the lower altitude and higher azimuth in the south-side. Sri Lanka being a small island, the variation of latitudes and longitudes within the country is insignificant. And the results show a difference for each district, it does not vary in large numbers. From the energy simulation results, it could be proved that thermal comfort could be increased using an effective shading device. The cost analysis proves that approximately five hundred Sri Lankan rupees could be saved from the electricity bill per month for an average residential house with a floor area of eighty-one square meters.

**Keywords:** *Shading devices*

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## Prediction of Mechanical Properties of Steel Nanowires Using Molecular Dynamics

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### ABSTRACT

Index No: ES-06-19

Nanowires have received increasing interest due to their unique properties and potential applications. In this study, the dependence of the mechanical properties of steel nanowires with different carbon percentages at varying temperatures is investigated. Atomic interactions between Fe and C atoms are modelled using interatomic force fields for molecular dynamics (MD) simulations. Four interatomic potentials were evaluated [1][2][3][4][5] using their bulk properties. Modified embedded atom method (MEAM) potential by Liyanage et al. was selected due to its accuracy in predicting properties.

Uniaxial tensile simulations at varying C atom percentages and different temperatures are conducted using MD simulations with the LAMMPS package and stress-strain curves were generated. The amount of C was varied from 0 – 10 % at temperatures ranging from 0.1 K – 900 K. Young's modulus of the steel nanowires increased in the temperature range of 0.1 K – 300 K while decreased in the range of 600 K - 900 K with respect to the C %. Yield stress and Ultimate Tensile Stress gradually decreased with the increase of C atoms from 0 – 10 %. Predicted results were compared with the results of bulk steel experimental values. The micro-structural changes in the nanowires were analyzed with common neighbor analysis (CNA). CNA showed the rapid formation of slip planes with increasing C% and increased propagation of slip planes contributes to the reduction in the strength of the nanowires.

**Keywords:** *Nanowires, Uniaxial tensile test*

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# New Education Model for Sri Lanka in the Post COVID-19 Pandemic Era Using UML

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## ABSTRACT

Index No: TL-07-13

In the current context, all the UN member countries have implemented necessary action to achieve SDGs by 2030 [1]. Accordingly, Sri Lanka is also moving towards SDGs with a specific focus on enhancing the quality of education. This paper aims to present a conceptual model for a new education system for Sri Lanka in the post COVID-19 pandemic era. Here in, a conceptual model has been proposed using an object-oriented approach and unified modeling language (UML). In this Framework functional and static views of the system is also presented and use case diagrams and activity diagrams have been used to explore predefined functional requirements of the system, while class diagram have been used to explore the static view of the system [2].

**Keywords:** *e-learning, Online education, Post COVID-19 pandemic era, Unified Modelling Language*

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## The Necessity for New Learning Model during the COVID-19 Pandemic

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### ABSTRACT

Index No: TL-08-15

E-Learning means education conducted via electronic media, typically on the internet. Owing to the current global pandemic situation, all the education institutes in the world have shifted from the traditional face-to-face teaching to online teaching. The global education has shifted to online learning platforms to effectively manage their educational activities. This fundamental shift saw an increase in the use of e-learning. The System method can help to develop a learning management system within a short period. E-learning gives the university and private institute to create and deliver content, organize courses, manage students, and monitor the progress of multiple students, authoring, presenting, consuming, storing, and tracking educational content and training materials. [1]This Paper Evaluates Numerous Approaches engaged by education side to deliver teaching and semester examination in consideration of the COVID-19 pandemic situation. Direct learning and teaching activity of students has been greatly reduced due to COVID-19 situation. The purpose of this study is to find a solution to this problem. [2]

**Keywords:** *e-learning, establishment*

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## A Model for Digital Content Creation to Promote Inclusive Education in Sri Lanka

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### ABSTRACT

Index No: TL-09-22

This paper makes a strong claim on considering inclusive education in this era of e-Learning [1]. To achieve this objective digital content creation as a method for e-Learning should be designed in a way that promotes participation of all the students in the virtual setting [2]. The main aim of this research paper is to present a conceptual model which promotes inclusive education through enhancements of an existing platform that is designed to create digital content. For this purpose, object-oriented approach and Unified Modelling Language (UML) techniques are utilized [3]. Proposed framework includes the functional and structural views of the system [4]. Further, use case diagrams and activity diagrams have been developed to represent the functional requirements of the proposed enhancements, while, context diagram, class diagram and the state machine diagram have been designed to model the structural view of the system.

**Keywords:** *Inclusive education, e-learning, Digital content creation platform, Assistive technology, UML*

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## Adoption and Reflection of New Educational Model in Higher Educational Sectors at Present COVID-19 Pandemic.

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### ABSTRACT

Index No: TL-10-12

The education in the world was affected by the COVID-19 pandemic, especially higher educational institute process functionality was interrupted by stopping the physical class rooms. As per the COVID-19 effect the large number of higher educational institutes move to the online education like universities in Sri Lanka [1]. Higher educational institutes have taken their course orientation, lectures, registration, examination and assignment submissions or thesis submissions through online platform. The students and lecturers having issues to get the physical materials like reference books through online. Those problems are most identified in science course providing departments. Because the students in science stream have to prepare for their practical work. But they have a struggle to go to their institute and do the practical activities in pandemic situation. Therefore, the practical integrated online education accompanied LMS will help the university students. This paper analyses numerous approaches taken by higher educational sectors to deliver teaching, laboratory practices and semester examinations in consideration of the COVID-19 pandemic, while also considering the potential effects on the student learning experience and lecturers convenient. The mission of Sri Lankan higher educational sectors during the pandemic is offering accessible quality online education delivery, research and innovation in order to produce young leaders in the relevant fields to suit the needs by conducting collaborative learning and examination process without postponing the educational process of the students by charging the current pandemic impact by COVID-19.

**Keywords:** COVID-19, Pandemic, LMS, Online platform, Education, Digital learning, MS Team, Zoom, Learning model

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## Online Continuous Assessment System for Technical Colleges in Sri Lanka Using UML

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### ABSTRACT

Index No: TL-11-25

The research in this paper discusses the issues relevant to an existing manual assessment system, [1] and aims the development of conceptual model for Online Continuous Assessments System. This was achieved by using Object-oriented approach and Unified Modelling Language (UML). The functional and dynamic views of the system are presented and explained within this framework. Although above framework is used, since Structured Systems Analysis & Design Method (SSADM) provides a standard set of activities which cover the analysis and outline design stages of a system development project, Context diagram [2] also was included in SSADM. The functional system includes Use Case diagrams and Activity diagrams, while the dynamic view includes State Machine diagrams. Therefore, the proposed models are used to efficient implementation of Online Continuous Assessment System.

**Keywords:** *Online MCQ assessment, Unified Modelling Language, Behavioural models, Functional models, COVID-19 pandemic and education.*

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## New Education Model for Sri Lanka in the Post COVID – 19 Pandemic Era

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### ABSTRACT

Index No: TL-12-26

The COVID epidemic affected global education, particularly universities, with the shutdown of physical lecture rooms. Sri Lankan universities have moved to an online platform [1] for course orientation, lectures, registration, examinations, and assignment or thesis submission. Students and lecturers have difficulty accessing physical materials such as notebooks via the internet. These issues are more prevalent in science faculties where students must complete practical work in laboratories. They are, having difficulty getting to university and participating in practical activities during the pandemic.]. This study examines a variety of strategies used by universities to provide instruction for laboratory practical, and research activities. Examining the effect of COVID-19 over the course of a semester, while also taking into account the potential consequences of the environment.

**Keywords:** COVID – 19, Pandemic, LMS, MS Team, Zoom

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## Analysis of Future Demand for Sri Lankan ICT Undergraduates in ICT Industry: Mapping the ACM/IEEE Computing Degrees with Emerging Technologies

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### ABSTRACT

Index No: TL-13-02

Sri Lanka is famous for its agricultural economy, but in recent years it is slowly shifting towards a knowledge-based economy. In a knowledge-based economy, Information and Communication Technology (ICT) industry plays a critical role in increasing productivity and economic growth. This sector has generated numerous new job opportunities, led to increased export profits, and attracted international investors for investment. Present Sri Lankan ICT industry consists of over 600 companies [1]. According to reports from Sri Lanka Association for Software and Services Companies, the demand for the ICT sector has increased in recent years. The increase in demand for the ICT sector led to the creation of many ICT job opportunities as well as the opening of new ICT degree-awarding training institutes in Sri Lanka [2]. Government universities, private degree awarding institutes, government vocational and tertiary training institutes, and private diploma and certificate awarding training institutes are major categories of institutions that offer various degree programs in ICT disciplines [3]. According to SLASSCOM, there are fourteen job categories in the present-day ICT industry. Because of this reason undergraduates are unable to choose the most suitable ICT degree program according to the job demand. This research provides the solution for the above problem. The main objective of this research is to analyze the future demand for Sri Lankan ICT undergraduates in the ICT industry. This study will be of great help for undergraduates to choose the ICT discipline according to the demand of the job market. The future demand for ICT graduates in the ICT industry is examined in this research based on ACM/IEEE computing disciplines [4]. The secondary data for this research were collected from the National IT-BPM workforce survey and the university grant commission website. Finally, undergraduates can choose the best path in the ICT field by knowing the most demanding technologies in the ICT industry.

**Keywords:** *Emerging Technology, ICT Industry, ICT Undergraduates, Sri Lanka Association for Software and Services Companies*

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## Productive Web Application for Construction Guiding, Consulting and Providing Services

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### ABSTRACT

Index No: CT-14-04

Up to now, the Internet provides a vast platform for industries to expand their business opportunities. However, people do not obtain the maximum benefit from using modern technology in the construction process. For example, purchasing land, selecting house plans and purchasing hardware items is still done in the traditional way. Furthermore, most people are unaware of the approvals and permissions that must be obtained from the appropriate government authorities prior to the beginning of civil construction. Meanwhile, people do not have many facilities to get the right service from the right professional or the most suitable person at the right time. In this research, a web application is proposed to solve the above problems. Background research was conducted to discover available technologies and similar web applications in the market. Eleven websites that are related to the objectives of the proposed web application were referred. Some of them were for purchasing land [1], house plans [2] and hardware items [3] and some of them were for providing contact details of the service providers [4]. However, users cannot get access to all the functionalities related to home construction from a single website. Hence, the main aim of this study is to develop a productive web application for the construction industry, which provides guidance, consultation and services for users and service providers. The business need of the web application is to acquire financial benefits by hosting it on the Internet. The developed web application will enable someone to sell their land through paid advertisement. It will also allow professionals to publish their details on the web application through paid advertisement. Online hardware store can be maintained which will give a direct income to the person who maintains the web application. The next advantage is that professionals can use the web application as an advertising platform to publish their advertisements. Accordingly, it gives a solution to unemployment. HTML, CSS, JQuery and Bootstrap are used for the front-end development of the proposed web application. For backend development, PHP is used. Phpmysql is used for the database creation and management. SQL is used as the query language to fetch data from a database. The evaluation process was carried out for the verification and validation of the developed web application. Domain experts and technical personnel participated in that process in which bugs and errors were identified and fixed. Feedback was received and relevant suggestions were implemented to maximize the usability of the web application.

**Keywords:** *HTML, CSS, JQuery, Bootstrap*

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## Gift Eka: Online Gift Giving Web Platform for Sri Lanka

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### ABSTRACT

Index No: CT-15-07

Due to the current Corona pandemic, most buying and selling processes are done through online e-commerce platforms. Also, number of participants for celebrations\ has been limited due to the pandemic. Currently there are so many instances for people to show their affection to the loved ones, celebrate moments, and special occasions and to surprise others without having a physical meeting. Unfortunately, in Sri Lanka, most online shopping platforms are not specialized for gift giving applications. With this analysis, we came up with a clear idea to propose this “GiftEka” gifting platform which is different and special from current platforms [1],[2],[3].

Waterfall and Agile methodologies were used for this project because it gives the biggest advantage of adding new requirements for the plan in the middle of its development. For this project PHP, MySQL with Laravel 8 was used for development. By using Laravel 8 this whole project was developed under the Model, View & Controller (MVC) Architecture. Laravel 8 is a powerful MVC Controller PHP framework that is designed for developers who need a simple and elegant toolkit to create full-featured web applications [3] Users can select their gift items and wrapping types. Senders’ affection can be shared to the receiver by their gift items and associated wrapping feature. According to the study done on currently available gift platforms are not developed specifically for gifting. Rather they are developed for online shopping purposes such as grocery, wholesale or retail marketing. But “GiftEka” is far more advanced with new features of customizing gift items and providing customized gift-wrapping.

To analyze the success rate of the functionality and the accuracy of this proposed system test cases was carried out

This project has huge potential to provide better solutions for people under different scenarios and use cases.

**Keywords:** *Laravel 8, MySQL*

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## Traveling Assistant Mobile Application Using Location-Based Service

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### ABSTRACT

Index No: CT-16-08

Sri Lanka is a major tourist destination which has several historical places, rivers, waterfalls, and shrines, as well as many other places of interest. Currently, several mobile apps have been added to the Google Play Store for the convenience of these travelers, but these apps do not meet the latest needs of travelers. As a result of this project, created a new mobile application called “Travel Lanka” that addresses the issues and new needs of the travelers. This project follows the Agile software development methodology. Travel guidance is provided by displaying data on a google map view [1]. People can find the places for food and drink, shopping, and service places using Google maps. But it has no method to find a nearby travelling place. This application automatically suggests and shows nearby places on the map that can be travelled based on user location using the Haversine formula [2]. This application can automatically change the nearby places when the user moves from location to location. Also, users can find all places in a particular district or province and find any places by using place names. Travelers can filter places using place types as waterfalls, parks, mountains, beaches and so on. With the suggested places, users can view some important details about the places and receive navigation instructions. In addition to that, this mobile application facilitates users to view compass, use the suggested transport facility, currency converter and nine major languages are provided by this application. All the functions were tested using unit testing and integrated testing, Basically, how the user interfaces layout changes under different screen sizes were tested when creating this “Travel Lanka” application. This app is designed to suit different screen sizes of different mobile phones. A responsive layout has been created to display this application correctly on all types of phones. For this, testing was done using the package called “Device Preview” [3]. This Device Preview package helped to test various screen sizes, change device orientation, check background running capability, and many more. Such facilities are not available for use in a single mobile application currently offered to the tourism industry in Sri Lanka. A major challenge for travelers has to install and use the number of applications to get these features. Travel Lanka app combines all general features available in other apps. Feedback and user evaluations were collected and considered under the categorizing as usability, accessibility, accuracy, and correctness. Positive user feedback and user evaluations show the success and the usefulness of the application for the users.

**Keywords:** *Google Map, Travel Lanka*

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Students from the University of Kelaniya have presented their research results at the 1st Student Symposium of the Faculty of Computing Technology. The symposium is being held in association with the 6th International Conference on Advances in Technology and Computing (ICATC-2021).

Students presented the results of their research activities in the categories of Advancements in Applications of Computing Technology, Advancements in Applications of Engineering and Science in Technology, Continuous learning & social impact management using Technology,

**In the Track Advancements in Applications of Computing Technology,**

Students are involved in different fields such as Computer Engineering, Information Technology, Data Science, Cyber Security, Software Engineering, etc. In that scenario, they analyze, store, transport, and make decisions with data and information to help solve problems difficult to solve by a human brain.

**In the track Applications of Engineering and Science in Technology,**

Engineering Technology is a broad field that deals with practical industry and real-world issues. Students in this area research challenges in engineering fields such as mechanical, electrical, electronic, and civil. Including technologies such as Manufacturing systems, CAD/CAM, Nanotechnologies Etc. Research on this area is specially oriented toward the country's technological development.

**In the Track Continuous learning & social impact management using Technology,**

Learning is a general process that affects students, teachers, researchers, and industrialists. The country is experiencing various short- and long-term societal consequences, including natural disasters, facility problems, learning difficulties, and a lack of resources.

A continuous learning practice is required to assess societal impacts and direct society's knowledge, skills, and attitudes. Numerous research projects are currently underway in various areas, including online education, the use of social media, teaching strategies, and student guidance.

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