2009

pecipta

MALAYSIA

INTERNATIONAL EXHIBITION OF RESEARCH AND INVENTION OF INSTITUTION OF HIGHER LEARNING 2009

8 - 10 October 2009

Hall 1 and 2, Kuala Lumpur Convention Centre (KLCC)

Driving Research Innovation Toward Value Creation

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ectory of
arch Product

Organize By:

CRIM

Center for Research and Innovation Management

FOREWORD MESSAGE FROM

Professor Dr. Ahmad Yusoff bin Hassan

Vice Chancellor

Vice Chancellor

Assalamualaikum w.b.t.,

Welcome to Universiti Teknikal Malaysia Melaka (UTeM) exhibition booth at PECIPTA 2009 and I thank you for your interest in UTeM's research and innovation outputs. I would like to take this opportunity to highlight features that make UTeM an outstanding choice for very bright and talented students and academics as well as industry's choice for smart collaboration. Despite being young, the university has answered the government's call of meeting industries demand by engaging in smart partnerships with the private and public sectors. With such cooperation, our researchers will gain working experience and at the same time they will become acquainted with what is required in industry.

The strong research background of our faculty members means our students, both at undergraduate and postgraduate levels; learn the latest developments in the fields that they study and that qualified students will have an opportunity to conduct research under faculty supervision. Our strength is in the fields of engineering and technology, information and communication technology, technology management and techpreneurship. The products exhibited at PECIPTA 2009 are a small representation of our creativity and innovation in research activities.

Our research mission is to be regarded both nationally and internationally, as a respected entrepreneurial, research intensive technical university, excelling in research outcomes in our chosen areas of concentration and in the provision of research training, in which learning, teaching, and research are mutually supportive with University-Industry smart-partnership.

Our other goal is to have students who reflect the rich diversity of cultures of our community and our nation. We strive for this goal without any sacrifice in quality of our academic programs and our diversity enhances the learning experience of all our students. I invite you to have a look and as you visit our booth, please keep in mind that we are a relatively young university, and we are constantly enhancing the research experience of our students and staff. I hope to see you face to face in UTeM and please feel free to communicate with us.

I would also like take this opportunity to express my thanks to the university's Center for Research and Innovation Management (CRIM) for their effort in coordinating UTeM's participation in PECIPTA 2009.

Professor Dr. Ahmad Yusoff bin Hassan
Vice Chancellor

Universiti Teknikal Malaysia Melaka

FOREWORD MESSAGE FROM

Professor Madya
Dr Abu Bakar
bin Muhamad Diah

Deputy Vice Chancellor

Deputy Vice Chancellor (Research and Innovation)

Assalamualaikum w.b.t.,

Firstly, I would like to thank the Centre for Research and Innovation Management (CRIM) for giving me the opportunity to pen down a few words for this publication of UTeMs research abstracts due to the participation of UTeM to the International Exposition of Research and Inventions of Institutions of Higher Learning 2009 (PECIPTA 2009).

The key elements that define the quality and the outstanding of any university is based on their research outcomes. The quality of the research produced shows that the capability of the researcher, academicians, research staff and the students of the university. The research that turn out will not only benefit the society at large but it will also attract more bright students and outstanding researchers to work together and be part of the UTeM.

This publication provides functional information about the research that are selected to participate in the International Exposition of Research and Inventions of Institutions of Higher Learning 2009 (PECIPTA 2009) and this opportunity are taken to showcase UTeMs inventions, new technologies and latest product to the public.

I would like to congratulate all participants that are selected to represent UTeM in the International Exposition of Research and Inventions of Institutions of Higher Learning 2009 (PECIPTA 2009) 2009 and hope this publication will arouse them to produce productive and innovative research and in the end contribute to the national economic growth.

Lastly, I hope that researchers continue to bring into being outstanding research output and move towards bringing more creative and innovative applications in the years to come. Congratulations to the Centre for Research and Innovation Management (CRIM) Team for their efforts in position together this publication and to well organize the participation of UTeM in the International Exposition of Research and Inventions of Institutions of Higher Learning 2009 (PECIPTA 2009). Hopefully this will provide a medium for people to know and understand the objectives and achievements of UTeM better.

Wasalam. Thank you.

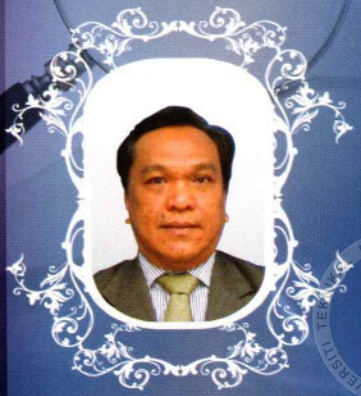
Professor Madya Dr Abu Bakar bin Muhamad Diah
Deputy Vice Chancellor

TABLE OF CONTENT

UNIVERSITY AT Glance

Universiti Teknikal Malaysia Melaka

FOREWORD MESSAGE FROM



Professor Dr Mohamad Kadim bin Suaidi

Director

Director
(Center for Research and Innovation Management)

Assalamualaikum w.b.t.,

Alhamdulillah, Centre for Research and Innovation Management (CRIM) of Universiti Teknikal Malaysia Melaka (UTeM), with the assistance and support of researchers and colleagues in the university is again able to participate in PECIPTA 2009.

The University is committed to the further enhancement of its research quality and productivity by investing in excellence and by exploring new, innovative ways of collaborating that will ensure we generate high quality research outcomes closely aligned to state, national and international research priorities. While basic and directed research remains vital to our research effort, UTeM must strengthen the impact of our research by further developing the links between our researchers, government, industry and the wider community. Emphasis will be given to collaboration with national and multinational strategic industries Multi-disciplinary 'research thrusts' have been one strategy to improve the University's profile and its responsiveness to complex questions of national significance. The establishment of research centers is a complementary strategy along this line. The University will complement its existing strategies for the creation of internationally competitive research centers with the development of a range of research priority clusters.

These will be outstanding, multidisciplinary research groupings that are well-placed to leverage national and international funding. The University will continually seek to improve its performance in the commercialization of its research, including growth in technology licensing, patents, and contract research and consultancies. These strategies will underpin the long-term sustainability of our research and innovation activities.

It is our sincere hope that this brief notes that showcase our research products would be able to convey to PECIPTA 2009 visitors, universities, industries and public communities, the cutting edge and pioneering research works that UTeM has embarked on. It is also our intention to make known of the readiness of UTeM in forging strategic partnerships with partners from outside the university in areas that are critical to the development of our beloved nation. We hope that you have an enjoyable time visiting the Expo and in particular UTeM's booths. Please feel free to contact us at CRIM, and we warmly welcome enquiries from potential partners in research, consultancy and innovative activities.

Professor Dr Mohamad Kadim bin Suaidi
Director

Universiti Teknikal Malaysia Melaka

University at GLANCE

YEAR ESTABLISHED

Universiti Teknikal Malaysia Melaka (UTeM) was formerly known as Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM) and was established on 1 December 2000. After the re-branding of KUTKM it is now known as UTeM commencing 1 February 2007.

UNDERGRADUATE

- International Student : 23
- Local Student : 5963
- TOTAL students : 5986

POSTGRADUATE

- Local Student : 374
- TOTAL students : 374

STAFF

- ACADEMIC Staff : 407
- NON ACADEMIC Staff : 892
- Total Staffs : 1299

UTEM CORPORATE

Booth

UTeM Corporate BOOTH

PERSPECTIVE VIEW 1

UTeM Corporate BOOTH

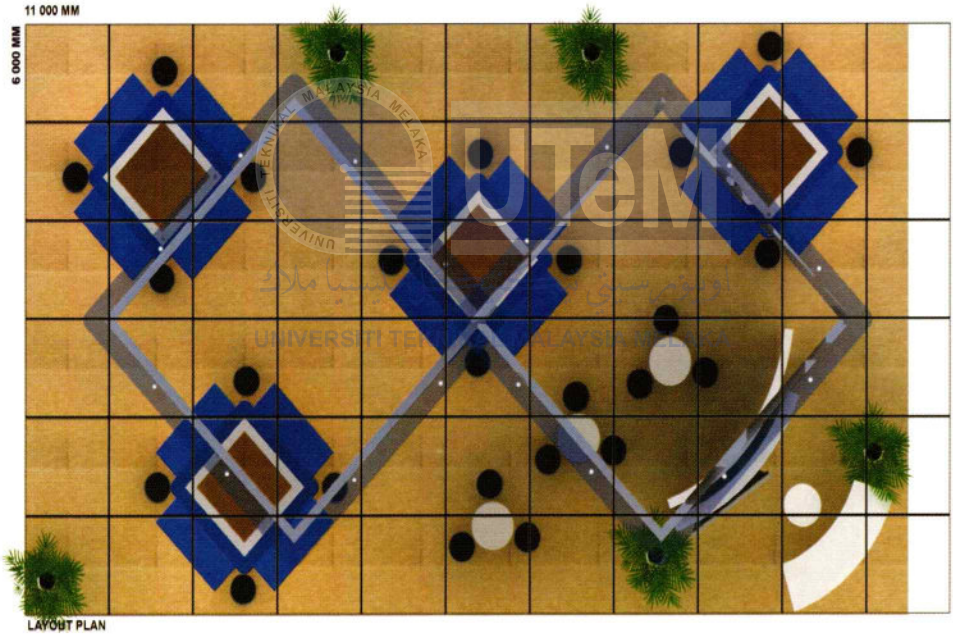
PERSPECTIVE VIEW 2

PERSPECTIVE VIEW 3

PERSPECTIVE VIEW 4

UTeM Corporate BOOTH

TOP ELEVATION



INDEX OF Researches

Index of Researches

Bil	Principal	Title
1	Mohd Rizal Alkahari	Design and development of Fire Fighting Machine
2	Engr. Siva Kumar Subramaniam	Intellectual and remotely self monitored Flood Observatory System (FOS)
3	Hidayat bin Zainuddin	Pico-Hydro Generation System Using Domestic Consuming Water for Electrical Energy Storage
4	En Mohamad Zoinol Abidin Abd Aziz	UTeM Antenna
5	Safarudin Gazali Herawan	Low Power Split Unit Air Conditioning using Thermal Energy Storage (TES)
6	Taufik	Design Improvement of Turbocharger using Genetic Algorithm and CFDSystem
7	Sulaiman Bin Sabikan	Line Tracking and Obstacle Avoidance for Automated Guided Vehicle using a USB camera.
8	Adnan Rachmat Anom Besari	Automatic Ablution Machine using Vision Sensor with Adaptive Skin Detection Method
9	Dr. Hjh. Norasiken Bt Bakar	Chemistry Courseware For Form 5 (Alkenes)System
10	Ranjit Singh Sarban Singh	Hexagon-diamond Grid System For Motion Tracking
11	Ahmad Zaki Shukor	Innovative Controller for Home Security and Monitoring System (iCon)
12	Mohd Riduan Bin Ahmad	Concurrent Medium Access Control with Short Signaling (CMAC-SS) for Multi-hop Wireless Mesh Networks (WMNs)
13	Ridza Azri Ramlee	Iris Recognition Algorithm Application to Observe Cholesterol Presence
14	Ir. Abdul Talib Bin Dinh	The Study Of Pneumatic Behavior For Application On Building Personal Lift
15	Zulkifli Tahir	Web Based Maintenance Decision Support System for Small and Medium Industries
16	Dr. Hamzah Bin Sakidin	The Effect of UNBabc Mapping Function Modification To GPS Tropospheric Delay Industries
17	Ismail Abu Shah	Redesign of Nail Clipper through BD Design for Assembly Methodology Industries

RESEARCH

Listing

Research
LISTING

Design and development of Fire Fighting Machine

Mohd Rizal Alkahari,
Liew Sow Ming, Mohd Zakaria Mohd Nasir,
Mohd Nazim Abdul Rahman, Mustafar Ab Kadir,
Md Radzai Said, Zairulazha Zainal,
Masjuri Bin Musa @ Othman, Mohd Khairi Mohamed Nor

Faculty of Mechanical Engineering

Email : rizalalkahari@utem.edu.my
Contact : Tel: +606 233 2603
Fax : +606 233 2429 HP: 013-4302468

ABSTRACT

The project is on the design and development of Fire Figthing Machine. Fire Fighting Machine is a remotely controlled machine consists of a mobile and rigid chassis that is equipped with functional equipment for fire fighting tasks. It carries camera, sensors, communication equipment, fire fighting equipment and other loads in order to control fire. The machine is wirelessly controlled via mobile computer. The nozzle of the machine can directed at different angle and can be elevated in order to control fire at different height. One of the great importance of the development of the Fire Fighting Machine is it can reduce the risks faced by fire fighters in performing their duties. This is due to the fact to the current fire fighting techniques require fire fighters to intervene in hazardous conditions. Working at very high temperature, dusty, low humidity, dangerous and others are among usual working conditions associated with fire fighting. Therefore, effective use of the machine can avoid direct contact of human with poisonous, flammable, explosive gases and chemicals, as well as radioactive or other hazardous materials that may have immediate or long-term effects on health.

Keywords: Machine Design,Fire Fighting,Rescue Machine

Intellectual and remotely self monitored Flood Observatory System (FOS)

Engr. Siva Kumar Subramaniam,
Siti Aisyah Anas, Datuk Associate Professor Dr. Abu Bakar Mohamad Diah, Professor Dr. Mohamad Kadim Suaidi and Professor Abdul Hamid hamidon

Faculty of Electronics and Computer Engineering

Email : siva@utem.edu.my
Contact : OFF: +606 5552021/ HP: +6016 6661612 Fax: +606 5552112

ABSTRACT

Flood occurs in many countries every year and often causes great losses towards mankind. The main causes of flooding are heavy rain, hurricane and undersea earthquakes (Tsunami). Monitoring and assessing such scenario is becoming a major threat for mankind. Respective authorities are on the hunt for ground breaking invention for real time flood alert system to assist them in efficiently monitor and be on the alert. This promising remote sensing technology is used to monitor flood remotely so that early precautions can be taken in the effort to save human life and mitigating flood's damages. The ability to receive relevant alerts, timely information empowers appropriate personnel to prompt danger in an effective manner. By receiving flood alert information's, this allows possible operational organizations such as private companies, hospitals, schools, public utilities and transportation entities to prepare and use their own emergency response plans to minimize potential damage. Such approach can be established in various potential flooding areas. The other feature of the system is it capable to predict the water/flood rise time and communicates accordingly to the appropriate personnel. Such afford helps them to predict flood rise time and early precautions can be taken based on the circumstances. The rise time will be calculated using the real time data provided from the remote sensing system with a simple algorithm which is embedded within the system. The system allows both transmitting and receiving data in the effort to improve the efficiency of flood assessment. Areas near to river, lake, reservoir etc., have high potential of flooding regardless of the weather conditions. Such an intelligent system is very practical to be implemented in the effort to minimize the risk factors caused by flooding in such areas. The ultimate aim of this research is to identify real time flood status which can be used for monitoring and assessing critical flood areas. The real time data from this system can be utilized by the respective authorities for further analysis and proficient counter measures. Behind all technological approach, favors mankind in many means towards a safer world and better living.

Keywords: Flood observatory system, wireless sensor, programmable logic controller

Research
LISTING

Pico-Hydro Generation System Using Domestic Consuming Water for Electrical Energy Storage

Hidayat bin Zainuddin,
Mohd. Hanid bin Didi, Muhamad Sharil bin Yahaya,
Jurifa binti Mat Lazi, Zulkifli bin Ibrahim,
Mohd. Farriz bin Hj. Md. Basar.

Faculty of Electrical Engineering

Email : hidayat@utem.edu.my
Contact : Tel: +606 5552344, Fax: +606 5552222

BSTRACT

his project describes the small scale hydro generation system using consuming water distributed to houses as n alternative energy source. Water flow in the domestic pipes has potential to generate electricity for energy :orage purposes in addition to the routine activities such as laundry, cooking and taking bath. The inherent ater pressure and flow inside the pipe from utilities' main tank that used for those usual activities is also used) rotate the hydro turbine to drive the mechanical shaft. This mechanical power is then being used to drive a enerator in order to generate electrical power. This system which is termed as "Pico-Hydro Generation System" as constructed using Permanent Magnet DC generator to produce DC power for battery charging purpose as mechanism of energy storage. The stored energy is applicable especially during electricity blackouts at home)r small loads such as LED lamp, mobile phone battery charging, toys battery charging and etc.

eywords: Pico-Hydro Generation System, Alternative Energy Source, Turbine, DC Generator, Battery Charging

UTeM Antenna

En Mohamad Zoinol Abidin Abd Aziz
Dato' Prof. Dr. Mohd Nor Bin Hussain
Dalila Binti Misman

Faculty of Electronic and Computer Engineering

Email : mohamadzoinol@utem.edu.my
Contact : OF: +606 5552182

ABSTRACT

UTeM antenna that are form by Meander Line Antenna (MLA) have been designed to operate at 2.4-GHz which are specified by IEEE 802.11b/g for WLAN. The characteristic impedance of Meander Line Antenna is 75 ohm with antenna width of 1.3mm which can produce a smaller size of antenna. An investigation to UTeM antenna has been done for the vertical part by changing it from left to right side, increasing the angle degree of parasitic α, and combination of different antenna width. Microwave Studio CST is used for simulation for both planar and microstrip antenna. The horizontal length h for meander line is 25mm, antenna width is 1.3mm and the parasitic radius is 25mm. By adding parasitic element, a better return loss can be achieved. As the angle degree of parasitic α is increased, the frequency has a small changes and the bandwidth increased from 48 to 70 MHz but the directivity seems to decrease from 9.64dB to 4.94dBi as the angle degree increase from 30 to 270 degree (for planar antenna). The antenna is fabricated on a double-sided FR-4 printed circuit board using an etching technique. The material substrate has dielectric constant ε r=4.7, loss tangent tanδ=0.019, and the thickness d =1.6mm. The design has been tested with the Network Analyzer The measurement results for planar antenna designs shows operating frequency at 2.51GHz with -13.52dB of return loss. The bandwidth is 70MHz starting from 2.48GHz to 2.52GHz. The antenna gain is 15.1dB. The measurement result for UTeM microstrip antenna shows that the operating frequency is 2.45 GHz with -13.36dB of return loss. The bandwidth is 73MHz start from 2.43GHz to 2.503GHz. The antenna gain is 7.6dB.

Keywords: meander, meander line, antenna, WLAN,

Research LISTING

Low Power Split Unit Air Conditioning using Thermal Energy Storage (TES) System

Safarudin Gazali Herawan,
M. Syamsul Hadi,
Mohd Shazni Bin Amerisah

Faculty of Mechanical Engineering

Email : safarudin@utem.edu.my
Contact : Tel: +606 233 2362

ABSTRACT

Thermal energy storage (TES) systems store a sizeable quantity of "cool" thermal energy that helps meet the cooling load of a building. A typical system of TES consists of a large vessel filled with water or brine that may contain multiple small containers such as encapsulated bricks or balls that filled with a fluid. This fluid can be changed the liquid/solid phase that the temperature is lower than the building's chilled-water temperature. In anticipation of periods requiring large cooling loads, typically at night, a chiller produces chilled water or brine that flows to the vessel, causing the encapsulated material to solidify or change phase and creating low-temperature reservoir. In other systems, an ice harvester may produce ice.

TES system can save energy in several ways, compared to conventional chillers. Nighttime chillers operation takes advantage of lower dry-bulb temperatures (for air-cooled condensers) or moderately lower wet-bulb (for water-cooled condenser) temperatures relative to daytime values, which also reduce chiller to lift.

The baseload power plant that operate at night typically have higher electricity generation efficiencies (on a primary energy basis) than the plants brought on-line to meet peak electricity demand. Consequently, displacing daytime chiller operation can reduce primary energy consumption.

Since the thermal energy system has a great benefit for saving the energy, it is very interesting for us to adopt this system into the split unit air conditioning for getting low power consumption.

Keywords: TES, Split Unit, Air Conditioning

Design Improvement of Turbocharger using Genetic Algorithm and CFD

Taufik,
Kuah Chuen Tse,
Prof. Dr. Mohd. Razali Muhamad,
Tajul Ariffin Abdullah

Faculty of Manufacturing Engineering

Email : taufik@utem.edu.my
Contact : Tel: +606 3316404 Fax : +606 3316431

ABSTRACT

Turbocharger is one of the approaches that utilize the exhaust gas of an automobile to drive the compression device The purpose of turbocharging is to increase the intake pressure and the amount of air into the combustion chamber to improve the efficiency of the engine. This research presents the investigation into the use of Computational Fluid Dynamics (CFD) and Genetic Algorithm (GA) for the design improvement of Turbocharger. Detailed description of the complete design process is described and numerous GA generation of the design optimization are presented with detailed examination of the several factors affecting the turbocharging system. In addition, variations of important geometrical design parameters are discussed in accordance to the GA results. The capabilities of the three-dimensional turbocharger design through GA are demonstrated by the fact that two different turbocharger systems were designed based on strict design constraint affecting their basic dimensions. As the results, the mathematical model has a very good agreement with the experimental data and it could be used for improving the design of turbine-compressor assembly through the bottom geometry changes of the compressor.

Keywords: Design parameters, Turbocharger, Genetic Algorithm, CFD, Optimization

Research LISTING

Line Tracking and Obstacle Avoidance for Automated Guided Vehicle using a USB camera.

Sulaiman Bin Sabikan
Marizan Bin Sulaiman,
Syed Najib Bin Syed Salim,
Muhammad Fahmi Bin Miskon

Faculty of Manufacturing Engineering

sulaiman@utem.edu.my
+6019-660 7615

ABSTRACT

This project present the design and development on the hardware and software of navigation control system for Vision-Based Autonomous Guided Vehicle (V-AGV) by detecting and recognizing line tracking with Universal Serial Bus (USB) camera. In this project, a mobile robot, a laptop computer and a low-cost USB camera are used as the main components of the system. The USB camera will allow the system to obtain digital images directly without using frame grabbers. The vision-based navigation system structure is composed of several processes; these processes consist of Guideline Detection, Sign Detection, Obstacle Detection and Avoidance and finally Speed Control. During the navigation process, the V-AGV would be able to recognize the straight and crossing track lines, detect any obstacle that appears in the navigational path, detect the sign as guidance, avoiding obstacle and perform speed control based on the current situations. In order to demonstrate the results of this proposed navigation system, a mobile robot platform as been developed. The results obtained from several experiments have shown that the USB camera has performed very well in executing the proposed algorithm. The proposed AGV system has the capability of following the constructed line properly, detecting a junction, identifying the existence of floor sign close to the guideline and most importantly be able to avoid collision with obstacles. This proposed navigation system needs only minimum modification before can be implemented on any mobile robot platform that can be used in robotic researches, education, office environment and factory environment.

Keywords : Vision-based Autonomous Robot, Guideline Navigation, Obstacle Detection, Line following, Machine Vision Application

Automatic Ablution Machine using Vision Sensor with Adaptive Skin Detection Method

Adnan Rachmat Anom Besari,
Ruzaidi Zamri, Md.Dan Md.Palil,
Ahmad Yusairi, Anton Satria Prabuwono,
Zulkifli Tahir, Habibullah Akbar

Faculty of Manufacturing Engineering
Department of Robotic & Automation

Email : adnan_ra@utem.edu.my
Contact : +6017 645 6030

ABSTRACT

Based on research, a Muslim will use six to nine liters of water during "wudhu". Water is something that is so cheap yet we take it for granted, but we need to conserve this life-sustaining resource. Because of that we need a machine that would enable Muslims to save water every time they perform the pre-prayer cleansing ritual called "wudhu" (ablution). We built a machine that allowed a Muslim performs cleansing ritual without water spillage and is environment-friendly as it encouraged water conservation. Now a day, some people have been inventing the early automatic ablution machine, but when it is commercialized the price is so high, and only rich people or big mosque can buy it. Because of that we build an automatic ablution machine using camera that easy and cheap to implement. This machine use embedded camera as sensor and servo motor as an actuator that is embedded on crane to turn and open it based on and object under the crane. It means that if there is an object under the crane, it will be opened, and when there is no object under the crane, it will be closed. Not just open and close the crane, we also use an adaptive method that detect how much water that Muslim need in this ritual, example the amount of water that is needed for rinse the mouth of course is more than wash the nose. And also this machine can detect when we collect the water and our hand is fulfill with water the crane will be closed automatically. This machine only consumes 1.5 liters to 3 litters' water for the whole ritual. Not only for ablution, this machine can be implemented in every field, hand wash, kitchen, bathroom, wherever place whether there is crane there in order to protection the water and environments.

Keywords: computer vision, automatic ablution machine, embedded camera, adaptive skin detection

Research
LISTING

CHEMISTRY COURSEWARE FOR FORM 5 (ALKENES)

Dr. Hjh. Norasiken Bt Bakar
Nuraziera Binti Mohd Hatta

Faculty Of Informationcommunication
And Technology

E-mail : aziera_jb@yahoo.com
Contact : 017-2805759

ABSTRACT

This project has brings some benefits and advantages to the user of the system. It will become a new way in learning as it can give a new experience for students learning chemistry using animation in courseware. Besides that, this courseware is to use the concrete approach in teaching and learning module to increase student's interest in learning chemistry in a new way which they can access rich media resources including animation, sound, picture and text and make the learning more exciting and entertaining.The expected output of this project is a collection of interactive learning, which can be operated using computer. The application should provide the interactive learning with simple animation. User should be able to understand the learning concept and answer the question given based on the notes and can play games that related to the learning. For the user interface design in this application contains design of a project or interface which player has direct contact with and which they interact to perform those activities. After the user enters the program, they can choose any of these options, e-notes, e-quizzes, e-questions and e- glossary. When user chooses to read the e-notes, the subtopic will be displayed. In this module will provide some activity to allow student try to do what they have learnt by drag the object to create the structure and name the isomers. Some element of animation was using in this module to make the learning more interesting. One character was developing to guide the note in this courseware. If the users choose the quiz option, they may choose the level they want. After that, they can return to the main page. If the users choose the question option, they may choose the year of the question they want. After answer all the question, the score will be given. For the analysis phase plays main important in developing a project as it focused on what developer must know or do on the project. To make sure that development met user's expectation and also to gain accuracy in terms of content presentation, testing was done to the target user and the multimedia tester to show whether the application is successful or not. This project is to make sure that the student whether the application is successful or not. This project is to make sure that the student will completely understand the concept through the interactive notes with a simple animation.

Hexagon-diamond Grid System For Motion Tracking

Ranjit Singh Sarban Singh,
Sani Irwan MD Salim,
Siva Kumar Subramaniam,
Siti Aisyah Anas

Faculty of Electronics and Computer Engineering

Email : ranjit.singh@utem.edu.my
Contact : +606 5552161/ HP: +6012 5541369

ABSTRACT

The proposed project is to develop a hexagon-diamond grid system for motion tracking in video sequences. This project will propose a simulation technique for tracking purpose using the MATLAB system. Hexagon-diamond grid system will be implemented using the block based technique to determine the grid coordinate of the motion tracking. The motion tracking grid coordinate is use as reference coordinate point for motion tracking purposes. Based on the hexagon grid, the hexagon search grid system comprises seven points including the center point. A small diamond search grid system covering five points is inside the hexagon grid search system including the center point. This small diamond grid search is to finalize the focused motion track search. Hexagon grid search is applied because of the block displacement of real-time video sequences are mainly in horizontal and vertical directions. Basically, the hexagon grid search algorithm applies the horizontal and vertical directionality search. While, the small diamond search grid applies the horizontal and vertical search but it limited in the hexagon grid search system. The motion tracking grids coordinate point is then use to focus at the coordinate region for any examination purposes. Based on the grid coordinate point there will be a region of interest to be examine when the coordinate point is taken as reference point.

Keywords: New Hexagon Search, Motion Estimation, Center-Biased Algorithm, Motion Vector.

Research LISTING

Innovative Controller for Home Security and Monitoring System (iCon)

Ahmad Zaki Shukor,
Muhammad Herman bin Jamaluddin

Faculty of Electrical Engineering

Email : zaki@utem.edu.my
Contact : OF: +606 5552205/
HP : Fax: +606 5552266

ABSTRACT

The project, Innovative Controller for Home Security and Monitoring System (iCon) is a small and compact and affordable home security and monitoring, interfaced with the PC via designed visual interface, and added with additional data logging features. This data-logging feature is not only recorded on Personal Computers. In the case of power failure or PC failure, data logging is done simultaneously on the memory card, allowing users to monitor the condition or status of the sensors based on the time set by the Personal Computer. The initialization of the Real-Time clock of the memory module is done beforehand. A variety of commonly used sensors are attached to the system controller, namely the magnetic door sensor, the motion sensor, shock sensor, temperature sensor, humidity sensor and smoke sensor. These vital sensors are attached and any over-limit of the sensors will be detected by the controller, then sent to the PC and memory card for data logging. When the conditions are secure or the sensor returns to normal conditions, the data is also saved. As an added feature, a GSM is attached to the system, allowing any information on abnormal conditions sent to the user's mobile phone and the user can control the system via SMS.

Keywords: security system, monitoring system, microcontroller, data logging, visual interface

Concurrent Medium Access Control with Short Signaling (CMAC-SS) for Multi-hop Wireless Mesh Networks (WMNs)

Mohd Riduan Bin Ahmad
Vigneswara Rao Gannapathy
Prof. Dr. Mohamad Kadim Bin Haji Suaidi
Prof. Madya Muhammad Syahrir bin Johal

Faculty of Electronic and Computer Engineering (FKEKK)

Email : riduan@utem.edu.my , gvnesh@gmail.com
Contact : 0122568025, 0126345237

ABSTRACT

The IEEE 802.11 Distributed Coordination Function (DCF) Medium Access Control (MAC) protocol continues to suffer from throughput degradation when directly applied in multi-hop Wireless Mesh Network (WMN). The Request-to-Send/Clear-to-Send (RTS/CTS) signaling partially solved hidden node problems however the exposed node problems remain unaddressed. The IEEE 802.11 MAC does not allow the exposed nodes to initiates its transmission for the entire duration of ongoing transmission over multi-hop network leads to throughput degradation. Moreover, the amount of needed signaling packets takes place at every hop reduces the overall multi-hop throughput significantly. This project proposes a set of enhancement to the existing IEEE 802.11 DCF MAC by enabling concurrent transmission by the exposed nodes and reduces the amount of signaling packets (CMAC-SS) required at every hop until the data packet reaches its destination. Analytical models are developed and simulated over quasi-static Rayleigh fading channels. The multi-hop network performances are evaluated in terms of throughput and delay. The CMAC-SS protocol outperforms the existing IEEE DCF MAC with more than 14% increase in overall throughput of multi-hop WMN.

Keywords – Exposed Node Problems; MAC protocol; Concurrent transmission; Short Signaling; Multi-hop Wireless Mesh Networks

Research
LISTING

Iris Recognition Algorithm Application to Observe Cholesterol Presence

Ridza Azri Ramlee

Faculty of Electronic and Computer Engineering

Phone No./Ext : 5552155
Email : ridza@utem.edu.my
H/p contact no.: 0123948547

ABSTRACT

The objective of this paper is to discuss the application Iris Recognition Algorithm for scanning the presence of the cholesterol in human body with analysis human iris. This research manoeuvre the iris recognition method done by John Daugman's and Libor masek's with extends it in medical purpose for detecting diseases (cholesterol) according to iridology. This analysis use MATLAB program to execute Iris Recognition Algorithm for localize the iris segment (sclera and limbic). The shape rectangular is selected after transform the circular shape of iris. MATLAB programming gives the result from this analysis whether cholesterol is presence or not.

Iris recognition, biometric identification, cholesterol detection, biomedical engineering, identify diseases.

The Study Of Pneumatic Behavior For Application On Building Personal Lift

Ir. Abdul Talib Bin Din ,
Roslina Aida Bt. Rahimi ,
Prof. Madya Ir. Mustafar Bin Ab. Kadir

Faculty of Mechanical Engineering

Email : talib@utem.edu.my
Contact : HP: 019 6265756

ABSTRACT

The objective of this research is to design and develop a cost-saving yet safe building personal lift for up to four storey building. The design analysis carried out is focused and based mainly on identifying the characteristics and limitation of the pneumatic lift used for building of 4 storey and below. Literature review on all pneumatic personal lift available in the market and journal on pneumatic lift was carried out in order to tap the findings of other researchers and use it in the design process. The best conceptual idea of pneumatic personal lift was determined by analyzing and improving the existing available system in the market. The limitations and disadvantages of the selected conceptual model were identified and further studied and the solutions to improve its characteristics were sought in the process of designing and developing a more practical pneumatic lift for low rise building. The limitations of the compressed air in lifting applications were also identified and used as a guideline to design cost-saving, safe and user-friendly pneumatic personal lift. During the last stage of the research, a small size model of pneumatic personal lift for low rise building was fabricated incorporating all design aspects derived from the theoretical and experimental data. Matlab Simulink simulation was performed onto the prototype in order to validate the data obtained. The validated data shall be used in the design of an actual size building structure at UTeM's innovative product testing bay.

Keyword :Pneumatic lift, Low-rise building lift, Personal lift

Research LISTING

Web Based Maintenance Decision Support System for Small and Medium Industries

Zulkifli Tahir,
Burhanuddin M.A.,Anton Satria P.,
Adnan Rahmat A.B., Habibullah Akbar

Faculty of Information and Communication Technology

Email : zulkifli_ra@utem.edu.my
Contact : Tel: +601 69718697

ABSTRACT

In general, the maintenance system is designed to assist in the planning, management, and administrative functions required for effective maintenance. These functions include generating, planning, and reporting of work orders; the development of tracery history; and the recording of parts. In order to improve the effectiveness of the units, maintenance decision support system (DSS) extremely needed to simplify the maintenance management process and to reduce the time needed to make a maintenance decision. The proposed application focuses on maintenance decision support system for data analysis in small and medium industries (SMI) using web based concept. The problems are based on the factors that influence the effect of machinery failure. The objective is to design and develop DSS modules with some algorithm extension for implementing the problems factors into decision making models, which are Decision Making Grid (DMG) and Analytic Hierarchy Process (AHP). The information gathered mainly via SMIs raw data collection, interviews on SMIs and internet resources for system develop. The result is shown that the most appropriate maintenance strategy and maintenance decision can be determined to follow from each combination of problems factors. Next, SMIs can implement this system to support their maintenance decision process.

Keywords: Maintenance Decision Support System, Decision Making Grid, Analytic Hierarchy Process, Small and Medium Industries.

The Effect of UNBabc Mapping Function Modification To GPS Tropospheric Delay

Dr. Hamzah Bin Sakidin,
Dr. Tay Choo Chuan,
Saedah Sakidin.

Faculty of Electrical Engineering

Email : hamzahsakidin@utem.edu.my
Contact : OFF: +606 5552201/ HP: 016-3141939
Fax: +606 5552266

ABSTRACT

Tropospheric delay refers to the refraction of the Global Positioning System (GPS) signal as it passes through the neutral atmosphere from the satellite to the earth, which causes longer distance traveled by the signal. The zenith tropospheric delay can be amplified by mapping function, especially for less than 5 degrees elevation angle. Many mapping functions have been established however the mapping functions give large value when the elevation angles less than 5 degrees. A modification of UNBabc mapping function has been proposed. The modified UNBabc mapping function model shows a significant reduction of mapping function scale factor. As the coefficient of the zenith tropospheric delay, the value of mapping function will affect total tropospheric delay. The modification UNBabc mapping function has improved the tropospheric delay up to 19.1 percent at two degree elevation angles.

Keywords: Tropospheric, mapping function, zenith, modification

Research
LISTING

Redesign of Nail Clipper through BD Design for Assembly Methodology

Ismail Abu Shah,
Mohd Badli bin Ramli

Faculty of Manufacturing Engineering

email:ismailas@live.utem.edu.my

ABSTRACT

Even before the financial crisis started to affect the manufacturing industries, the industrial people have been talking about how to lower the manufacturing cost as early as the product design stage. Boothroyd Dewhurst's (BD) DFA method is one of the methods that being used to overcome this problem. BD's DFA analyzes and evaluates product designs for ease of assembly. This tool guides the design team to drive the manufacturing cost by focusing on part count to achieve cost reduction through product simplification. Thus to improve a design through the BD's DFA method, nail clipper has been chosen as a product in this work to ease the assembly. The main objective is to redesign the existing nail clipper by reducing the part count and come with additional new feature. In a product design, part count is a major influencing factor when considering the assembly efficiency. The DFA method starts with the analysis to rate each component on its ease of orientation and assembly of an existing nail clipper design. In the original design, six components need to be analyzed to optimize manufacturing cost. Through the methodology, the redesign helps to simplify the design and reduce the part count into three components. From the simplification approach, the cost estimation can be carried out. It predicts the cost of the product before a great deal of capital resources have been consumed in the design where in this work, 50% of parts reduction will help tremendously. This explain the conceptual design using BD's DFA helps to identify potential saving that manufacturing people need to be implemented especially in this economic downturn.

Keywords : DFA, part count, cost

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Perpustakaan Laman Hikmah
Universiti Teknikal Malaysia Melaka,
Hang Tuah Jaya, 76100 Durian Tunggal,
Melaka, Malaysia.

Phone: +606-270 1200 Fax: +606-270 1039

For more information, please contact:

Centre for Research & Innovation Management
Universiti Teknikal Malaysia Melaka
P.O. Box 1752, Pejabat Pos Durian Tunggal,
76109 Durian Tunggal, Melaka

Tel : +6(06) - 331 6071
Fax: +6(06) - 331 6075
crim@utem.edu.my

You can also visit us at:
www.utem.edu.my