SEPARATION AXIOMS USING FUZZY CLOPEN SETS IN FUZZY BITOPOLOGICAL SPACE

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Abstract

Clopen sets in fuzzy topological space was introduced by Erdal[5]. In this paper, we extended clopen sets in fuzzy topological space to fuzzy bitopological space. Using these clopen sets in fuzzy bitopological, we introduce fuzzy pairwise slightly precontinuous functions. We further defined fuzzy pairwise pre-T_0, fuzzy pairwise pre-T_1, fuzzy pairwise pre-T_2, fuzzy pairwise Co-T_0, fuzzy pairwise Co-T_1, fuzzy pairwise Co-T_2. We investigated certain thorems on separation axioms using fuzzy pairwise slightly precontinuous function.

1 Introduction

In Mathematics, a subset A of X can be equivalently represented by its characteristic function χ_A a mapping _A from the universe of

Some Stronger Notion of Fuzzy Regular Space through Fuzzily Closed Sets

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Abstract

When there is no well-defined distance function, the more abstract definition proceeds with the notion of open sets. The notion of an open set provides a fundamental way to speak of nearness of points in a topological space. Such open sets are stamina of topological spaces. Limit points of topological spaces plays an inevitable role not only in determining convergence but also in closed sets. Among various paradigm changes in science and mathematics, one such change concerns the concept of uncertainty. Fuzzy set theory provides a major newer paradigm in handling with uncertainty. Lakshmana Gomathi Nayagam and Ramakrishnan defined fuzzily closed sets which provides an fascinating transition from crisp sets to fuzzy sets. In this paper, a new perception of fuzzy regular space called fuzzily regular space is defined via fuzzily closed sets. The behaviour of this fuzzily regular space with

A feasibility study on $SnO_2/NiFe_2O_4$ Nano composites as anodes for Li ion batteries

S. Balaji, R. Vasuki, D. Mutharasu

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A feasibility study on $SnO_2/NiFe_2O_4$ Nano composites as anodes for Li ion batteries

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Abstract

The $SnO_2/NiFe_2O_4$ Nano composite samples with varying concentration of SnO_2 such as 5 wt% and 10 wt% were synthesized via urea assisted combustion synthesis. The kinetics of the combustion reactions were studied using thermo gravimetry analysis and from which the compound formation temperature of all the samples were observed to be below 400°C. From the morphological analysis the grain size of $NiFe_2O_4$, 5 wt% SnO_2/ $NiFe_2O_4$ and 10 wt% SnO_2/ $NiFe_2O_4$ samples were observed to be around 1.7, 2.3 & 3.5 microns. The chrono potentiometry analyses of the samples were performed against lithium metal electrode. The capacity retention was found to be higher for composite with 10 wt% SnO_2. The discharge capacity of 10 wt% SnO_2 sample with respect to Li metal and $LiMn_2O_4$ electrode was observed to be around 980 mAh/g and 138mAh/g respectively.

Keywords

Electrode materials, Atomic force microscopy, Electrochemical impedance spectroscopy, Scanning electron microscopy, X-ray diffraction, Thermal analysis.

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Yellow emitting Cd doped SnO_2 nanophosphor for phosphor converted white LED applications

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Yellow emission
pc-WLED

ABSTRACT

The optical properties and defect emission of Cd doped (10 and 20 mol%) SnO_2 nanoparticles were investigated. The structure and phase purity of the nanoparticles were studied from powder XRD pattern and micro-Raman spectra. XRD pattern revealed the effective substitution of Cd^{2+} in the Sn^{4+} sites. The application of microwave for the combustion reaction causes the formation of homogeneous fine particles with crystallite size around 7.5, 6.1 and 7.1 nm for pure SnO_2, 10 mol% Cd doped and 20 mol% Cd doped SnO_2 nanoparticles, respectively. The influence of fine particle size and doping of Cd^{2+} ions reduces the optical band gap of SnO_2 nanoparticles from 3.08 to 2.98 eV. The existence of surface defects, induced by the smaller size of the particles and the heterovalent doping, was confirmed by the micro-Raman spectral analysis. ESR spectra revealed that there is a significant concentration of singly ionized oxygen vacancies present in undoped as well as Cd doped SnO_2 nanoparticles. High surface defects of the nanoparticles give rise to the broad emission band in the wavelength range of 450–625 nm. The surface defects, causes the visible emission, includes the oxygen deficiency produced by the doping of the cation (Cd^{2+}) with low oxidation state than that of host cation (Sn^{4+}), tin interstitials and dangling bonds. The excitation of pure and Cd doped SnO_2 nanoparticles with 325 nm laser leads to the emission of yellow light and the emission intensity varied by Cd doping. A wide excitation band (300–400 nm) observed for the emission at 530 nm revealed that visible emission can be obtained by the pure and Cd doped SnO_2 nanoparticles under the excitation of UV light. White emission with high CRI of 85.6 and CIE Coordinates of (0.32, 0.30) is achieved by exciting the mixture of blue phosphor with yellow emitting SnO_2 nanoparticles using 375 nm LED chip.

1. Introduction

Today's most common approach for white light generation is based on the conversion of a fraction of the blue/near UV light emitted from the LED by an inorganic phosphor material, known as phosphor converted white LED (pc-WLED), a solid state lighting (SSL) system [1]. Based on LED's, for the white light generation, there are three different approaches (i) mixing of red, green and blue-emitting LED chips (ii) yellow phosphor coupled with blue LED and (iii) a blend of red, green, and blue- phosphors pumped by ultraviolet chips. However, pc-WLEDs made by yellow phosphor coated on blue-LED undergo some disadvantages, such as lack of spectral contribution, poor color rendering index, high fabrication cost, low stability of color temperature and poor luminous efficiency due to energy reabsorption [2,3]. Furthermore, the requirement of different driving currents for the operation of red, green, and blue LEDs is complicating the fabrication of WLED by combining them [2]. Despite the variation of driving current, UV-LEDs are optically much more stable and are considered as the direction for the growth of SSL because of their high efficiency and easy fabrication [2]. Nowadays, near UV chips with a blend of trichromatic red, green and blue emitting phosphors or a combination of yellow- and blue emitting phosphors have elicited interest in the fabrication WLED's, due to the greater CCT and CRI of these LEDs. Also, it is feasible to tune the CCT and CRI by varying the R/G/B or Y/B ratio. Several phosphors such as $LaSiO_2N$:Eu [4], Alkali earth sulfides doped with Eu^{2+} and Ce^{3+} [5], Ca$(Sr,Ba)_2SiO_4$:Eu^{2+} [6], Ca_2BO_3Cl:Eu^{2+} [7], $Sr_8MgLa(PO_4)_7$:Eu^{2+} [8] and $SrWO_4$:RE (Sm^{3+}, Eu^{3+}, Sm^{3+}) [9] were investigated and applied to the fabrication of WLEDs using NUV-LED. However, these phosphors are containing very expensive rare earth elements and involved tedious synthesis procedure. Therefore, the discovery of new near UV excitable,

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Our Reference : UMP.02.01/12.23/2/5 (4)
Date : 22 June 2018

ASSOC. PROF. DR. G. KANAGARAJ
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INDIA

Dear Sir,

APPOINTMENT AS VISITING ASSOCIATE PROFESSOR AT UNIVERSITI MALAYSIA PAHANG

We refer to the above matter.

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Position	:	**Visiting Associate Professor**
Length of employment	:	**One (1) month** *(effective from the date of reporting duty)*
Faculty	:	**Faculty of Manufacturing Engineering**

3. During your service, you will be reported to the Dean of the Faculty. However, you are subject to be transferred or secondment to any faculty, centre, division, department or section in the university when required in the course of performing your duties.

4. This appointment does not involve any expenses by the university.

5. Your entry into this country is subjected to the Malaysian Immigration procedures. We will assist you in obtaining the necessary official document/clearance required, but you will be responsible to pay for the Multiple Entry Visa and other attendant charges as require by the Immigration Department.

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7. This offer of appointment is also subject to satisfactory outcome of a medical report to be certified by the Malaysian Embassy/High Commission. If you decide to accept this offer, please complete the attached Form BPK.L2 by consulting a physician of senior standing. This form is to be returned to us as soon as possible.

... 1/2

Our Reference : UMP.02.01/12.23/2/5 (4)

8. Please take note that your honorarium are subject to Malaysian Income Tax provisions. The payment of the income tax will be your personal responsibility. If you intend to travel outside Malaysia (whether on official duty or otherwise) for any length of time during the currency of your contract you are advised to ascertain on how the temporary absence from Malaysia will affect your tax liability.

9. The officer should complete Teaching and Learning courses during the first Period of Engagement with Universiti Malaysia Pahang and certified by the Head of Department.

10. Please find enclosed the following documents for your further action. You are required to complete and provide documents based on the checklist provided

11. Should you accept this appointment, please notify us the date you wish to report for duty as soon as possible by completing the Letter of Appointment Acceptance (BTJ.L1).

12. If the university does not receive any response from you within one (1) month from the date of this letter, it will be deemed that you are not accepting thi offer.

14. Do not hesitate to contact us at +609-4245238 should you require further information.

We look forward to seeing you at Universiti Malaysia Pahang.

Thank you.

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"Communitising Technology"

Yours Sincerely,

(MOHD NAZMI BIN SAHDAN)
Executive
Human Resource Division
for Registrar / Chief Operating Officer

c.c : 1. Dean, Faculty of Manufacturing Engineering

2. Busar / Chief Finance Officer, Universiti Malaysia Pahang

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1.	Duration of Appointment	Minimum of one (1) month but not exceeding One (1) year, and renewable based on performance. The appointment is on a FULL TIME basis, subject to the teaching and learning timetable set out by the Faculty/Centre/Institute
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5.	Medical Benefit	Provided at the University Health Centre or university's panel clinics.
6.	Flight Ticket	Return Economy Class flight ticket for the dates required by the Faculty/Centre/Institute for the said officer only.
7.	Privileges	i. Using the title of a Visiting Associate Professor while serving the university. ii. Using the facilities provided by the university such as : a. Library b. Telephone, fax machine and electronic mail c. Laboratories, computers, office facilities as approved/determined by the Dean. d. University's fund for any publication with the university as the publisher.
8.	Job Specifications	i. To conduct lecturer/seminar/workshop in the specified field of expertise to university staff and students. ii. Visiting Lecturer who appointed for more than one (1) semester is required to carry out research work in the specified field of studies. iii. To provide consultancy services in the procurement of new equipment required to enhance the specified field of studies. iv. To assist in getting accreditation from professional bodies for programmes which are yet to be accredited. v. To establish a joint cooperation with the organization where the Visiting Lecturer was employed at.
9.	Leave	Allocated annual leave in accordance to position held
10.	Termination of Appoinment	Either party *(University or Visiting Lecturer)* may terminate the appointment by giving written notice the the Vice-Chancellor

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Full Length Article

Low voltage cathode-luminescent properties of Zn co-doped Y_2O_3:Eu red phosphor

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ABSTRACT

Zn co-doped and undoped Y_2O_3-Eu red phosphor was prepared by citric acid gel method and it was investigated to know its cathodoluminesecent properties at low voltage excitation (< 2 kVs). In this connection the cathodoluminescence (CL) spectra of Zn co-doped and undoped phosphors were taken and they showed various line emissions along with a sharp red emission at 611 nm, irrespective of Zn concentration, due to $^5D_0$–$^7F_2$ transitions from Eu luminescent center. It was found that the incorporation of Zn could significantly enhance the CL emission intensity of Eu at about 33% when compared with Zn undoped phosphor. It was also found the Zn co-doping could not alter the crystal structure whereas it could change the morphology of the particles. The promising results revealed the possible application of this phosphor materials as red phosphor for field emission displays [FEDs].

1. Introduction

In recent days, considerable interests are shown on the development of phosphors for low voltage display devices viz, field emission displays (FEDs) because its inherent advantages over the bulk cathode ray tube (CRT) and liquid crystal displays (LCD) and also for white light emitting diodes (WLEDs) due to energy saving lighting systems. In FEDs, excitation of phosphor involves at low energy electron (< 2 kV) and high current density irradiations (< 100 mA/cm^2). Many sulfide phosphors, which yield efficient luminance at this excitation, unfortunately, decompose during operation due to electron-stimulated reaction. This decomposition leads to a sulfur deficient non-luminescent layer on the phosphor surface and reduces the phosphor efficiency. Moreover, the by-products of the sulfur are known to poison the electron emitter [1–3]. The fast growing flat panel display market has boosted researches that focus on the improvement of oxide phosphor for FEDs due to its chemical stability and stable luminescence. Since the excitation involves at low voltage, wide band gap semiconducting oxide phosphors are gaining importance, due to reduction in surface charge up and generation of more e–h pairs in the host crystal that results in better luminous efficiency [4–7]. On the other hand, efforts have been taken by coating wide band gap conductive oxides on the surface of the phosphors [8–10]. These oxides afford recombination centers like oxygen vacancies around the surface of the phosphor powder, remove the surface bound electrons and make incident electrons to easily excite in bulk crystal lattice of phosphors. In addition, attempts have been made to develop high efficient red phosphors by doping impurities that create oxygen vacancies in phosphor crystallites with the goal of developing high efficient phosphors at low voltage excitation [11–15]. Among this, defective structure ZnO is widely studied for its peculiar stable luminescent properties that depend on the preparation condition, annealing atmosphere, deposition substrates, precursor, source, etc. [16,17]. In the present work, we executed researches with ZnO as a dopant in Y_2O_3 host lattice (along with Eu, as a luminescent center). The former is a chemically stable, wide band gap n-type semi-conductor (Eg, 3.3 eV) and transparent to visible radiation [18]. It can serve as high efficient low voltage phosphor as it has optonic applications due to its conductivity and excitonic emission in the UV region, respectively [19,20]. In addition it is well known for its strong defect broad band emission at the visible wavelength range at the variable excitation wavelength from near UV to blue light [17]. The later, Y_2O_3 is an insulating phosphor crystal (Eg, 6 eV), and it is an unsurpassed red emitting (Y_2O_3:Eu) component that emits a sharp emission line at 611 nm, in which larger part of intensity is concentrated. This phosphor is

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TCE

Dr D Jeya Mala <djmcse@tce.edu>

STC 2015_Regional Round Details_Chennai

STC [QAI] <STC@qaiglobal.com> Wed, Sep 9, 2015 at 3:06 PM
To: djmcse@tce.edu

Dear Dr.D.Jeya Mala,

Greetings from Team STC 2015!

Firstly, we would like to thank you for your submission and congratulations for your selection in the Regional Qualifying Rounds for **Best of the Best – Testing Leadership Awards for STC 2015.**

In all we had received a total of 477 submissions from across the globe. We believe that the process for screening would be a tough, considering the quality of content submitted to us. After an initial screening, **76** papers & practices have been selected for participating in the regional qualifying rounds at **Chennai** under various categories.

The schedule for your Regional Rounds is confirmed as per the following details. There is an addition of the point of contact details. Rest all information remains same.

DATE	12.SEP.2015[Saturday]	TIMINGS	9:50:00 AM
PANEL NO.	C01	CITY	Chennai
CATEGORY	Tools & Techniques	ID NO.	7
PAPER TITLE	A Novel Framework for Vulnerability Analysis of SQLIA on Web Applications Using Graph based Static Source Code Analysis Approach		
AUTHOR(S)	Dr.D.Jeya Mala M.Eswaran N.Deepika Malar		
VENUE ADDRESS	**Cognizant Technology Solutions [STPI]** Unit 2, Customer Care Centre, Plot No H-4, SIPCOT IT Park Old Mahabalipuram Road, Siruseri Chennai – 603103 Entry from Gate No. 2		

QAI COORDINATOR	Venkat Kotapati | +91 9591999899 | venkat.k@edistatesting.com
HOST COORDINATOR	Madhvi Kumar | +91 91768 08756 | madhvi.kumar@cognizant.com
INSTRUCTIONS	1. Each individual presenter is provided 15 minutes to present their topic, and the content including change time between presentations. The remaining 5 minutes is for Q&A. 2. The presentation shall be primarily in a power point format. 3. Do not write to us with changes in the presentation time slot. 4. The decision to accept late attendees is completely left to the choice of the jury. 5. For ad-hoc situation please keep a copy of your presentation on your e-mail id / accessible through your smart phone. 6. No hard drives or external disks, etc. are allowed inside the venue premises. In exigency, you can only access your e-mail id to retrieve the presentation. 7. Please carry a photo identity card to the venue along with a print out of this confirmation e-mail. 8. Decision of the Jury Panel will be absolute. 9. Your Regional Round Coordinators should be contacted only on the day of the regional rounds and not before the same. 10. For queries, please call or e-mail the Conference Manager at 011 - 47776630.

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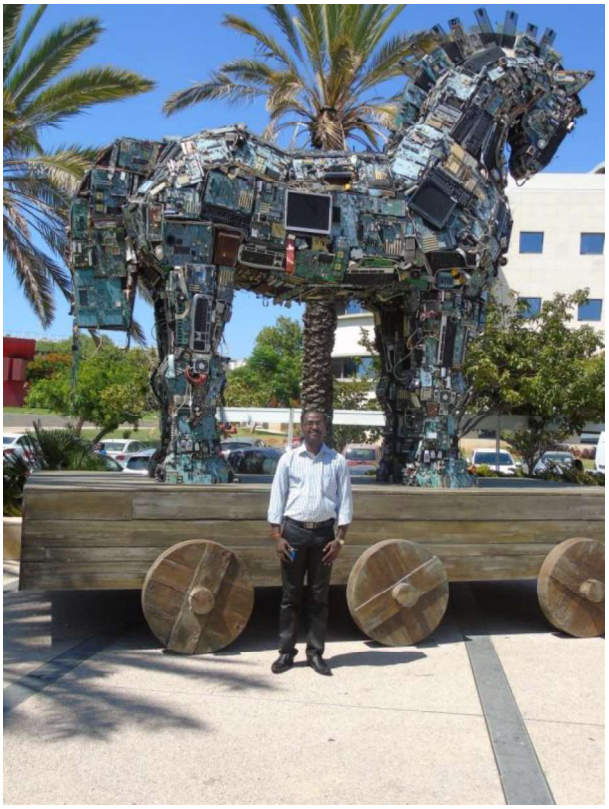
Cyber Week 2017, Tel Aviv University, Israel

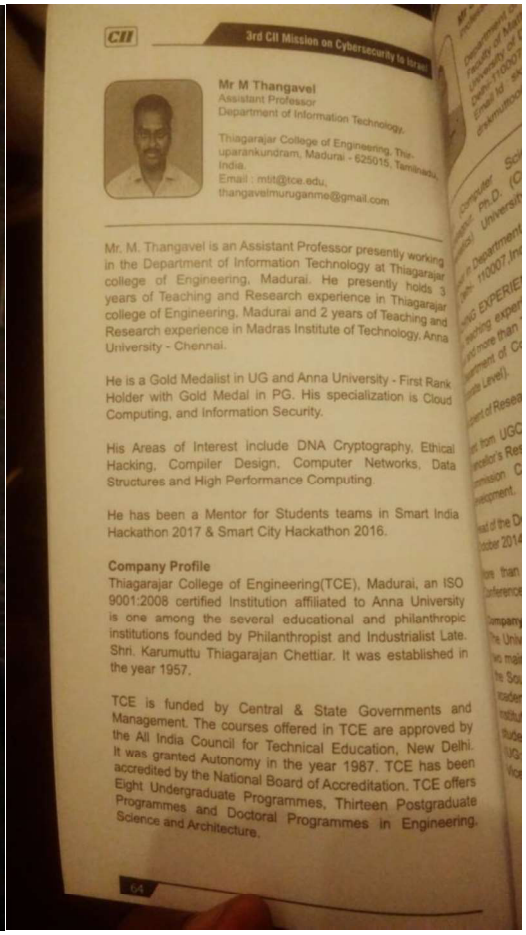
M.THANGAVEL, AP-IT :: PARTICIPATION REPORT

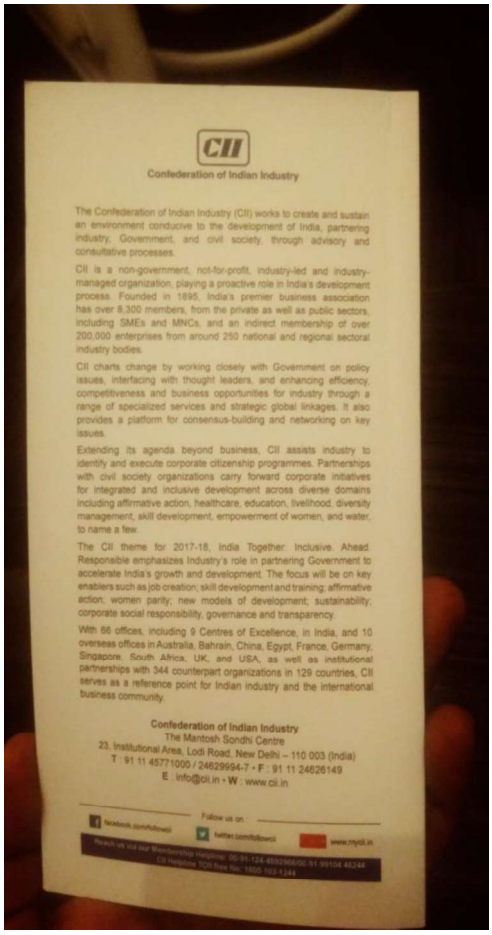


(Below Timings - Israel)

25.June.2017

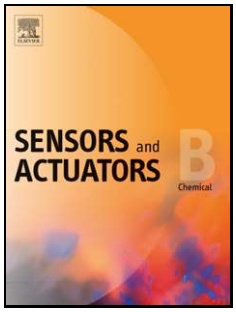
7.30 AM : Mission Briefing Meeting by Priyanka Mukhija, CII





8.30 AM : Industrial Visit - Checkpoint

Experts from Checkpoint Software Technologies Ltd demonstrated their products relevant to Cybersecurity and their progress towards security solutions. Presented Security Report 2016.



Title: Rhodamine based effective chemosensor for Chromium(III) and their application in live cell imaging

Authors: Omprakash Sunnapu, Niranjan G. Kotla, Balaji Maddiboyina, Gyati Shilakari Asthana, Jeyabalan Shanmugapriya, Karuppanan Sekar, Subramanian Singaravadivel, Gandhi Sivaraman

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Rhodamine based effective chemosensor for Chromium(III) and their application in live cell imaging .

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Chemistry SELECT Full Papers

Analytical Chemistry

Rhodamine-Based Fluorescent Turn-On Probe for Facile Sensing and Imaging of ATP in Mitochondria

Omprakash Sunnapu,[e, g] Niranjan G. Kotla,[a, b] Balaji Maddiboyina,[c] Srujan Marepally,*[d] Jeyabalan Shanmugapriya,[f] Karuppannan Sekar,*[g] Subramanian Singaravadivel,*[e] and Gandhi Sivaraman*[a]

We have developed a "turn-on" fluorescent probe **ARP-1** as a colorimetric and fluorescent chemosensor for adenosine-5'-triphosphate (ATP) through hydrogen bond interactions. The probe exhibits "turn-on" fluorescence response to ATP with a 15-fold fluorescence intensity enhancement under 10 equiv. of ATP added. The experimental results show that the response behavior of **ARP-1** toward ATP is pH independent (pH 4.0-8.0). The novel chemosensor has high specificity towards ATP from other nucleoside polyphosphates such as ADP and AMP. The favorable interaction between a triphosphate unit of ATP and *N* atoms of probe **ARP-1** is attributed to H-bonding. Consequently, the enhanced emission and naked-eye changes are attributed to spirolactam ring-opening. It is evident from our findings that the role of the chain length as well as the NH, OH groups and the phosphate group(s) contribute to interaction between the probe and the nucleotide. Cell permeability and selectivity towards ATP was demonstrated in HeLa Cells. Colocalization experiments were carried out with MitoTracker green and **ARP-1** showing that the mitochondrion selective imaging ability of **ARP-1**. The live cell imaging experiments in HeLa cells exhibited high selectivity of probe **ARP-1** with fluorescence *turn*-On response. **ARP-1** could also be explored for understanding the cellular functions.

Introduction

Sensing intracellular ions cations, anions and neutral molecules with the molecular receptors is of increasing interest as these ions play a vital role in modulating several biological processes. Among the intracellular anions, phosphates are regarded as fundamental ions in biological systems due to their role in information processing, energy storage and signal transduction.[1] Adenosine triphosphate (ATP) is the primary source of energy which is responsible for intracellular energy transfer that in turn controls several cellular functions.[2] The cleavage of one or two phosphate groups in ATP, yielding adenosine-5-diphosphate (ADP) and adenosine-5-monophosphate (AMP), liberates −30.5 kJ/mol and −45.6 kJ/mol of energy respectively.[3] It also acts as a chemical energy transporter within the cells such as glycolysis, Kreb's cycle, proteins transferring actions, ion channels regulation, muscle contraction, degradation of biological molecules and signalling pathways.[4] Apart from this, ATP is also involved in the insulin secretion, cell motility, DNA replication and transcription process. The decreased level of ATP leads to symptoms such as ischemia, Parkinson's disease, and hypoglycemia.[5] To study the multiple cellular mechanisms, enzyme activity, and other activities involving the production and consumption of ATP, instantaneous monitoring of ATP levels is essential.[6]

ATP detection has gained more importance in biological science, medical research, food industries and environmental monitoring with greater selectivity and high sensitivity.[7] There are two ways to analyze ATP in biological samples such as immunoassay system based on antibody interaction and enzymatic reaction depending on ATP level. Detection of ATP

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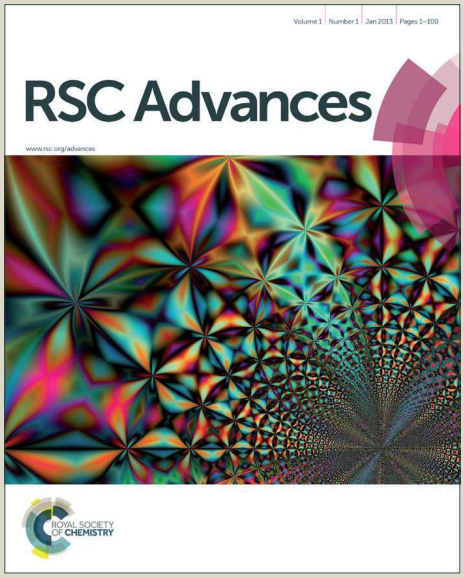

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Boranil Dye Based "Turn-on" Fluorescent Probes for Detection of Hydrogen Peroxide and Their Cell Imaging Application

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Jayabalan Shanmugapriya,[a‡] Kandasamy Rajaguru,[b‡] Gandhi Sivaraman,[c‡] Shanmugam Muthusubramanian*[b] and Nattamai Bhuvanesh[d]

The synthesis of boranil dye fluorescent probes for the detection of hydrogen peroxide has been described. The probes exhibited high selectivity in sensing hydrogen peroxide among other reactive oxygen species, reactive nitrogen species and biologically pertinent species. The probes display good sensitivity and rapid response time. The sensing mechanism was ascertained by ESI-MS analysis and density functional theory (DFT) calculations. The probes have been successfully applied for imaging of H_2O_2 in HeLa cells under physiological conditions.

Introduction

It is known that reactive oxygen species and reactive nitrogen species play crucial roles in human cancer growth.[1] Reactive nitrogen species (RNS) include nitric oxide radical (NO·), ONOO−, nitrogen dioxide radical (NO_2·) and other products arising while NO· reacts with O_2·−, RO· and RO_2·.[2] RNS have been distinguished as playing a critical protagonist in the physiologic regulation of smooth muscle cells, nervous cells, juxtaglomerular cells, platelets.[3] The body produces reactive oxygen species (ROS) such as hydrogen peroxide, superoxide (O^{2-}) and hydroxyl radical (·OH) single oxygen ($^1O_2$), hypochlorous acid/hypochlorite, peroxyl radical (·OOR) during the metabolism processes, which lead to an inexorable influence of aerobic metabolism and in pathogenesis of cancer, cardiovascular diseases and neurodegeneration.[4] Hydrogen peroxide is one of the most important reactive oxygen species in living systems[5] and intracellular production of H_2O_2 is interconnected to the accomplishments of certain enzymes that have been associated in vital cellular processes, including cytotoxicity, apoptosis, proliferation and cell growth.[6] However, the extreme production of H_2O_2 can detract cellular structures or biomolecules[7] and may cause the oxidative modifications of DNA bases, the production of alkali labile sites and strand breaks, which encourage mutations aging, Alzheimer's disease and even cancer.[8] Still, hydrogen peroxide is recognized as an applicant in slaying of pathogenic microbe[9] and a physiological regulator of intracellular signalling conduits.[10] Hence, effectual monitoring of ROS in the living cells and tissues is very critical for normal body processes and is supportive to estimate the biological functions.[11] Several probes, including proteomics probes and fluorescent probes have been tested for the detection of H_2O_2 in the living cells.[12] Chemical approaches comprising colorimetric method,[13] fluorimetric method,[14] electrochemical method,[15] and mass spectrometry analysis[16] have also been developed to detect hydrogen peroxide. But fluorescent probes ensure higher selectivity and sensitivity as well as real-time imaging and in recent years, fluorescent probes have emerged as excellent tools for the detection of ROS in living cells and biological molecules.[17] Certain fluorescence probes based on boronate ester or benzenesulfonyl ester have been reported.[18] Elucidation of the outcome from the reported turn-on probes could be difficult and complex.[12-19] However, currently boranil dye based fluorescent probes are not available for the detection of H_2O_2. From this point of view, we have developed very stable and pH independent boranil dye based probes using a low cost and easy synthetic methodology for the detection of H_2O_2 selectively towards various ROS and RNS, the applicability of which has been extended towards the imaging of H_2O_2 in living cells. To the best of our knowledge, reports are not available for sensing hydrogen peroxide using boranil dyes.

Borinic complexes with different chelating ligands have evidenced to be used in the organic light emitting devices (OLEDs) application and its dyes can be used for bio imaging and diagnostics.[20] Boron(III)-containing fluorescent dyes are used in numerous fields such as material science chemical biology and analytical chemistry.[21] Schiff base boron compounds are four-coordinate boron(III) complex and have

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Luminescent sensor for copper(II) ion based on imine functionalized monometallic rhenium(I) complexes

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ABSTRACT

Novel imine functionalized monometallic rhenium(I) polypyridine complexes **(1–4)** comprising phenol moiety with 2,2′-bipyridine ligands **L1-L4** have been synthesized and characterized by various spectroscopic techniques. These complexes function as selective and sensitive sensor towards the copper(II) ion demonstrated by UV–vis absorption, luminescence and time-resolved spectroscopic techniques. An enormous enhancement is observed in emission intensity, quantum yield and luminescence lifetime with the addition of copper(II) ion due to the restriction of C=N isomerization in the Re(I) complexes. The strong binding between copper(II) ion and these complexes can be inferred from the binding constant values, which are in the range of 1.1×10^4–2.4×10^4 M^{-1}. Furthermore, the structural and the absorption features of the complexes have been supported by density functional theory (DFT) and time-dependent DFT (TDDFT) calculations.

1. Introduction

There has been mounting interest in recent years for the synthesis of structurally simple chemosensors that can effectively signal binding phenomenon of the ionic analytes in terms of quality and quantity [1,2]. Further, the development of novel colorimetric and fluorescent sensors of biologically active metal ions is an active area of investigation because of their potential applications in life sciences, medicine, chemistry, and biotechnology [3–5].

Copper is one of the most abundant essential trace elements found in the human body and has a fundamental role to sustain important physiological processes. The Cu^{2+} ion present in the biological system can react with molecular oxygen to form reactive oxygen species (ROS), which are likely to produce the potential damage to proteins, nucleic acids, and lipids [6]. Under abnormal uptake/deficiency copper can lead to disorders associated with neurodegenerative disease, such as Menkes disease, Wilson diseases, Alzheimer's disease (AD), familial amyotropic lateral sclerosis and prion disease [7,8]. Accordingly, the World Health Organization (WHO) has set the maximum allowable level of copper in drinking water at 2.0 ppm (~30 μM) [9]. Nevertheless, copper contamination and its potential toxic effects on human beings continue to be challenging problems throughout the world due to the widespread use of Cu^{2+} in agriculture and industry [10,11].

Due to the intrinsic paramagnetic property of Cu^{2+}, many probes show a "turn-off" (quenching) response *via* an electron/energy transfer process [12]. "Turn-on" (enhancement) fluorescent probes reported for Cu^{2+} are mainly based on chelation-enhanced fluorescence or chemodosimeters [13]. For practical applications, probes with fluorescence turn-on signals in the presence of Cu^{2+} are superior to those with "turn-off" signals [14]. Hence, the development of new Cu^{2+} selective turn-on fluorescent probes is of the utmost importance and necessity. A number of mechanisms are proposed for the sensing of chemical species such as photoinduced electron/energy transfer (PET) [15], intramolecular charge transfer (ICT) [16,17], excimer/exciplex formation [18], excited-state intra-/intermolecular proton transfer (ESIPT) [19] and C=N isomerization [20]. But after Wang et al. [21] reported the inhibition of C=N isomerization mechanism for Schiff base receptors upon their metal ion complexation, the C=N isomerization has

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Faculty of Engineering
Department of Electrical and Computer Engineering

NUS National University of Singapore

Date: 16th March, 2016

TO WHOMSOEVER IT MAY CONCERN

It is certified that Dr.S.Charles Raja, Assistant Professor, Department of Electrical & Electronics Engineering, Thiagarajar College of Engineering, Madurai has visited Department of Electrical and Computer Engineering, National University of Singapore during the period 14th March 2016 to 16th March 2016 for the research interaction on Enhancement of Available Transfer Capability (ATC) using FACTS Devices in Restructured Electricity Market as a part of Career Award for Young Teachers (CAYT) from All India Council for Technical Education (AICTE), India. Also he has delivered two seminars entitled with "Determination of Available Transfer Capability in the Restructured Electricity Market" and "Enhancement of Available Transfer Capability (ATC) using FACTS Devices in Restructured Electricity Market" on 15th March 2016 jointly organized by Green Energy Management & Smart Grid Research Centre (GEMS), Department of Electrical and Computer Engineering, NUS, IEEE Power and Energy (PES) Singapore Chapter, and IEEE PES Student Branch NUS Chapter.

Thank you.

Sincerely,

Dipti SRINIVASAN (Dr.)
Associate Professor, Department of Electrical Engineering
E-mail: dipti@nus.edu.sg

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Prof. Dr. C. Palanichamy
BE MSc (Engg)(Distn) PhD CEng MIET MISTE

Professor
Faculty of Engineering

Academic Visit – Appreciation Letter

15th May 2017

To
Dr. Charles Raja, Assistant Professor,
Department of Electrical & Electronics Engineering
Thiagarajar College of Engineering, Madurai-625 015
Tamil Nadu, India.

Dear Dr. S. Charles Raja,

Greetings to you!

As one of the activities of the Centre for Electric Energy and Automation (CEEA), Faculty of Engineering, Multimedia University, Cyberjaya, invited you to share your successful research experience with our students and academic staff.

Having accepted our invitation, you were kind enough to be with us in Malaysia during 2017 May 13th to 16th and presented a **Seminar on Recent Trends in Power System Deregulation on 15th May 2017**. Your technical presentation was thorough, interesting, informative and interactive. Your interaction with our senior faculty members were technically sound and it has thrown some light on further research collaboration through research students' short visits between the two universities.

On behalf of the Centre for Electric Energy and Automation (CEEA), Faculty of Engineering, Multimedia University, Cyberjaya, I thank you very much for your time and effort to be with us and your valuable presentation to our students.

With regards,

Prof. Dr. C. Palanichamy
Chairperson,
Centre for Electric Energy and Automation

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Generative methods and the design process: A design tool for conceptual settlement planning

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ABSTRACT

This paper implores the possible intervention of computers in the generative (concept) stage of settlement planning. The objective was to capture the complexity and character of naturally grown fishing settlements through simple rules and incorporate them in the process of design. A design tool was developed for this purpose. This design tool used a generative evolutionary design technique, which is based on multidisciplinary methods. Facets of designing addressed in this research are:

- allocation of each design element's space and geometry,
- defining the rules, constraints and relationships governing the elements of design,
- the purposeful search for better alternative solutions,
- quantitative evaluation of the solution based on spatial, comfort, complexity criterions to ensure the needed complexity, usability in the solutions.

Generative design methods such as geometric optimization, shape grammars and genetic algorithms have been combined for achieving the above purposes.

The allocation of space has been achieved by geometric optimization techniques, which allocate spaces by proliferation of a simple shape unit. This research conducts an analysis of various naturally grown fishing settlements and identifies the features that would be essential to recreate such an environment. Features such as the essential elements, their relationships, hierarchy, and order in the settlement pattern, which resulted due to the occupational and cultural demands of the fisher folk, are analysed. The random but ordered growth of the settlement is captured as rules and relations. These rules propel and guide the whole process of design generation.

These rules and certain constraints, restrictions control the random arrangement of the shape units. This research limits itself to conducting exhaustive search in the prescribed solution search space defined a priori by the rules and relationships. This search within a bounded space can be compared to the purposeful, constrained decision making process involved in designing.

The generated solutions use the evolutionary concept of genetic algorithms to deduce solutions within the predefined design solution search space. Simple evolutionary concepts such as reproduction, crossover and mutation aid this search process. These concepts transform by swapping/interchanging the genetic properties (the constituent data/material making up the solution) of two generated solutions to produce alternate solutions. Thus the genetic algorithm finds a series of new solutions. With such a tool in hand various possibilities of design solutions could be analysed and compared. A thorough search of possible solutions ensures a deeper probe essential for a good design.

The spatial quality, comfort quality of the solutions are compared and graded (fitness value) against the standard stipulations. These parameters look at the solution in the context of the whole and not as parts and most of these parameters could be improved only at the expense of another. The tool is able to produce multiple equally good solutions to the same problem, possibly with one candidate solution optimizing one parameter and another candidate optimizing a different one. The final choice of the suitable solution is made based on the user's preferences and objectives.

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A passive design solution to enhance thermal comfort in an educational building in the warm humid climatic zone of Madurai

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ABSTRACT

Thermal comfort levels in the classrooms of a naturally ventilated (NV) educational building in Madurai have been evaluated by qualitative and quantitative analysis and the thermal discomfort zones have been identified. Considering shading of building envelope as one of the best passive cooling techniques, this study has explored the possibility of designing a shading device using solar charts and shadow angle protractor for the classrooms in the case study building, to reduce the heat gain from the windows and external walls. Hand tools and manual presentation techniques in architectural design are always preferred to the complicated, skilled based computer drawings for low height buildings. Now-a-days there are lots of simulation tools for designing buildings, but they are dependent on the weather files in a particular format for that region, which makes it a challenge to arrive at proper solutions for all regions. Hence, this paper is focused to give an insight to budding architects and engineers to use simple methods to design low energy buildings in a better way for any particular region using the local climatic data alone.

1. Introduction

Thermal comfort has a major influence on the quality of indoor environments. There are lots of environmental factors, like natural and artificial lighting, ventilation, air quality, noise, temperature and humidity levels, which affect the health and performance of occupants in an educational building. Thermal discomfort in educational buildings can result in undesirable conditions such as heat stress for both teachers and students. Heat stress can be distracting for the occupants and can have a negative impact on their learning capacity [1]. Moreover, energy is one of the major factors required to achieve thermal comfort. Energy availability in India is scarce and people have to protect themselves from these extremities of the climate in a natural way [2]. The design strategies that could improve thermal comfort in buildings vary greatly from one climatic region to another [3]. The building's thermal performance is mainly determined by the strategic design of the building envelope, orientation of the buildings and fenestration, which influence the potential of day lighting and natural ventilation to cool or heat the interiors of the building [4]. Passive cooling techniques have a notable impact on promoting the thermal performance of buildings and also considerably reduce the energy demands required for cooling through mechanical ventilation. Hence, learning environments must be designed in a more self-sustaining way or climate responsive, so as to promote comfortable conditions in the indoors.

1.1. Background research

Studies of human response to a thermal environment have been conducted by ASHRAE since the 1920s. Some significant studies in this area include the ASHRAE Comfort Charts (ANSI/ASHRAE Standard 55-2004) Thermal Environmental Conditions for Human Occupancy [5], Olgyay's Bio-climatic Chart [6], and Mahoney tables developed by Koenigsberger et al. [7]. Amasuomo [8] evaluated the thermal comfort in the lecture theatres at the Niger Delta University, Nigeria located in the humid tropical zone and confirmed that thermal discomfort in the lecture theatre spaces affected the student's stress behaviours like concentration, focus on the subjects taught and briskness which affected their learning. Ramli et al. [9] and Barrett et al. [10] have investigated the impact of physical environment of a classroom on the occupants' behavior and performance and have given suggestions for the design optimal learning spaces in schools.

A very limited number of studies have been carried out by researchers in educational buildings in the Indian context in the past few decades. A thermal comfort study carried out by Pellegrino et al. [11] in naturally ventilated (NV) classrooms in a couple of universities located in Calcutta found that the thermal acceptability of the students were higher than specified by ASHRAE and ISO Standards. Baruah et al. [12] conducted an occupant's survey in Tezpur University, Assam and concluded that the comfort temperature range varies from 22 to 23.5 °C in winter month and

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ENERGY EFFICIENT PASSIVE DESIGN STRATEGIES FOR BUILDINGS IN MADURAI.

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#2 Assistant professor, Department of Architecture, Thiagarajar College of Engineering, Madurai, Tamilnadu, India.

ABSTRACT

The rapid growth of energy use has raised concerns over problems in supply worldwide. This has caused the exhaustion of energy resources and severe environmental impacts such as depletion of ozone layer, global warming, and climate change. Efficient use of energy plays an essential role in minimizing energy usage and carbon dioxide emissions. This paper focuses on planning principles and number of parameters which affect the human thermal comfort in warm humid climate of Madurai. Climatic classification map of India has been included for identification of the climate of Madurai. Also Design recommendations on the building design provided by Mahoney tables are used to compare with the design techniques in a few case study buildings with vernacular architecture of this region. The main objective of this study is to explore the possible means and ways of improving and increasing the effectiveness of energy efficiency strategies of buildings in Madurai.

Key words: Thermal comfort, Energy efficiency, Passive design, Climate, Energy.

INTRODUCTION

The Ministry of Power estimate about 20 to 25 percent of the total electricity consumed in government buildings in India is wasted because of inefficient design parameters of buildings, which results in an annual energy related financial loss of about 1.5 billion Rupees. (US $33 million).Energy is the major factor required to achieve thermal comfort. India has different climatic conditions ranging from extremely hot conditions to severely cold conditions. Energy availability is scarce and people have to protect themselves from these extremities of the climate in a natural way. The energy consumption in buildings is quite high and is expected to further increase because of improving standards of life and increasing world population. Air conditioning use has increasingly penetrated the market during the last few years and greatly contributes to the increase in energy consumption. The largest growth in GHG emissions between 1970 and 2004 has come from energy supply, transport and industry, while residential and commercial buildings, forestry (including deforestation) and agriculture sectors have been growing at a lower rate (IPCC, 2007). Continued GHG emissions at or above current rates would

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Design to Thrive

Computational Investigation of Natural Ventilation in an Educational Building in Madurai, Tamilnadu

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Abstract: Natural ventilation in educational buildings plays a vital role in energy conservation, thermal comfort, indoor air quality and reduction of carbon emission. This paper investigates the natural ventilation performance of a School of Architecture building located in the warm humid climatic zone of India. The study involves three phases, an evaluation of occupant's perception on overall comfort (summer, winter and monsoon) using Building Use Studies workplace survey, field measurements of outdoor and indoor weather conditions like temperature, air velocity and relative humidity and Computational Fluid Dynamics (CFD)- based simulations for the whole building. The numerical simulation on the discretized domain is carried out using ANSYS Fluent. The boundary conditions necessary for the CFD study were obtained from the experimental data measurements. The lowest air velocity recorded in the summer month has been considered for the simulation to understand the influence of architectural design of the building on natural ventilation. As a result, the unique characteristics of air flows within classrooms and studios were determined, and ventilation processes in various situations have been analysed, discussed and compared with the BUS survey results to validate each other.

Keywords: Natural ventilation, air flow, Computational Fluid Dynamics (CFD); occupant comfort.

Introduction

Natural ventilation may be defined as ventilation provided by thermal, wind or diffusion effects through doors, windows, or other intentional openings in the building as opposed to mechanical ventilation that is ventilation provided by mechanically powered equipment such as motor-driven fans and blowers. These natural ventilation systems may reduce both installation and operating costs compared to mechanical ventilation systems while maintaining ventilation rates that are consistent with acceptable indoor air quality (Emmerich et al, 2001). Occupants of naturally ventilated buildings are often more tolerant of fluctuations in the indoor climate (Brager, 2001). They tend to accept a wider range of temperature and humidity levels.

Consequently, in the recent decades, many researchers have investigated the airflow patterns, the temperature and contaminant distributions, and thermal stratification comfort as well as the effects of thermal buoyancy and wind force for naturally ventilated rooms or buildings (Nielsen 2002, Ramponi et.al, 2011, Yang et.al. 2014, Calautit et.al, 2015). However, the aforementioned most of researches and experiences of natural ventilation

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Effects of Changing Urban Environment of Madurai-Challenges and Opportunities for Future Environmental Sustainability

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Abstract

Urban development is the major cause for changes in environment, as it leads to increase in population density which thereby increases the households, industries and transportation. Thus, urban centres are the major contributors of greenhouse gases and global warming. This paper collates the evidence of climate change effects on areas of urban growth pattern, temperature variations over the past decades and changes in the air quality of Madurai. It is evident from various studies that built up areas in urban centres exert a considerable influence on the local climate and urban heat island intensity. This main aim of this paper is to give information to urban planners, architects and engineers about the importance of climate studies and tools to promote strategies and measures of sustainable urban development.

Top

Keywords

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Abstract

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An overview of passive downdraft evaporative cooling as an alternative to mechanical cooling systems in moderate and composite climatic zones of India

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ABSTRACT

Passive cooling refers to any technologies or design features adopted to reduce the indoor temperature of buildings without the need for conventional energy. Passive downdraft cooling (PDEC) system is an emerging system of passive technique and has proved to be successful in reducing the cooling load in buildings especially in hot and dry climates. The aim of this study is to explore the efficiency of PDEC systems in moderate and composite climatic regions of India, as well. The study is intended to understand the concept, spatial requirement, suitable climatic conditions and the mechanism of PDEC systems. The issues involved in design of PDEC towers have been addressed. The results suggest that effective design of PDEC towers could significantly reduce the energy bills and carbon footprints as well. This technique may therefore be widely relevant to non-residential buildings in hot climatic regions of India where more energy is required for mechanical cooling systems during the hot seasons; hence architects and engineers must initiate the importance of PDEC systems in their building design.

Key words : *PDEC, Climate, Energy, Ventilation, Comfort.*

Introduction

Buildings are objects ensuring comfort for their inhabitants. The thermal behavior of buildings is related to various factors, having climate as the top priority. During summers, buildings are exposed to high solar radiation and high temperatures, leading to overheated conditions, exceeding comfort levels in the interiors. At this time, cooling of buildings is important (Deshpande *et al.*, 2010). As per research done by TERI, about 50%-60% of energy consumed in Commercial buildings is by air conditioning in India which would further increase due to increase in global temperature. Growing use of conventional air conditioning systems in offices and commercial buildings is having a major impact on electricity demand (Jayswal, 2012).

Passive downdraft evaporative cooling (PDEC) systems are the next version of wind catching towers that have enormous potential to bridge the gap between natural ventilation and conventional air conditioned buildings (Corney *et al.*, 2012).

The evolution of PDEC system can be traced from 3000 years before as air vents in arched towers. Bahadori (1978) proposed an innovative design overcoming the drawbacks of Badgir system called as DECT (Downdraft evaporative cooling tower). Cunningham and Thompson (1986) made an experi-

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A Comparative Analysis of Land Surface Retrieval Methods Using Landsat 7 and 8 Data to Study Urban Heat Island Effect in Madurai

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Abstract: In this paper the urban heat islands (UHI) effect in Madurai region has been identified by retrieving the land surface temperature (LST) distribution.The aim of this paper is to implement an algorithm to measure land surface temperature in Madurai region and it's surrounding from Landsat thermal imagery. The Land surface temperature has been estimated by using Single Channel (SC) algorithm and Split-Window (SW) algorithm. These two algorithms can be implemented using Landsat 7 and Landsat 8 satellite data. The various methods adopted for retrieving the algorithm has been addressed in the present study. The results show that for Single Channel (SC) algorithm the error is approximately 1K-2K and in Split-Window (SW) algorithm the error is reduced becauseas SW algorithm uses two Thermal Infrared (TIR) bands for land surface temperature retrieval. In SW algorithm error is less than 1K. The results show that the LST generated using the SW algorithm was more reliable and accurate. From the final output it is revealed that barren lands, uncultivable land and urban areas experienced high LST and the areas with high vegetation cover and water body experiencing low LST. The results from both the algorithms show a variance of 5-6^{o}C between urban areas, barren lands and vegetation covers thus indicating the presence of UHI in Madurai city.

Keywords: *Landsat, Land Surface Temperature (LST), Single Channel (SC) algorithm, Split Window (SW) algorithm, Thermal infrared (TIR), Normalized Difference Vegetation Index (NDVI)*

1. Introduction

The urban air temperature is gradually rising in all cities in the world. One of the possible causes is the drastic reduction in the greenery area in cities. The distinguished climatic condition termed 'Urban Heat Island' (UHI) is developing in the rapidly urbanized cities. Madurai is also experiencing rapid urbanization that has resulted in remarkable UHI. Appropriate measurements of Land Surface Temperature (LST) are useful for urban climate studies due to its important role in the surface energy budget (Lucena et.al. 2013). The rising population and industrialization leads to changes in the land use and land cover patterns, thereby leading to a rise in land surface temperature. So it is essential to monitor LST in the urban areas. The traditional method to obtain LST is a measurement at fixed observation time and location by a thermometer. Due to the variable changes of LST, the method of discrete point measurement cannot obtain large-scale and continuous LST information. However, the development of satellite thermal infrared remote sensing technology makes it possible to get the LST distribution over large regions with a regular revisit capability (Yang et al., 2014). The retrieval of land surface temperature (LST) from high to medium spatial resolution remote sensing data is important, as it is useful for many environmental studies. Land Surface Temperature (LST) is also an important phenomenon in global climate change, as the increase in greenhouse gases in the atmosphere will lead to an increase of LST.

The present study estimates land surface temperature by using Single Channel (SC) algorithm and Split-Window (SW) algorithm. The prime focus of this research is to identify the appropriate method to estimate the land surface temperature from Landsat thermal imagery. The two algorithms can be implemented using Landsat 7 and Landsat 8 satellite data. The various methods adopted for retrieving the algorithm has been addressed in this study. The results show that for Single Channel (SC) algorithm the error is approximately 1K-2K and in Split-Window (SW) algorithm the error is less than 1K because in SW algorithm two Thermal Infrared (TIR)) bands are used for land surface temperature retrieval. From the final output it is revealed that barren lands, uncultivable land and urban areas experienced high LST and the areas with high vegetation cover and water body experiencing low land surface temperature. Urban heat island phenomenon is evident from the LST images.

1.1 Study Area

Madurai is the third largest city in the Indian state of Tamil Nadu and one of the oldest continuously

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Reference No: MMU/FIST/TM/TC001 Date 23 December 2014

INTENT DECLARATION

We are happy to state that the Faculty of Information Science and Technology (FIST), Multimedia University, Melaka, Malaysia is willing to collaborate with the Department of Computer Science and Engineering, Thiagarajar College of Engineering, Madurai, Tamilnadu, India to jointly work on collaborative technical project on (Topic: Sentiment Analysis) the details of which are furnished below. I assure that our resources will be effectively used for the success of the project.

Proposal References:

Project Title: A Real Time Multilingual Customer Sentiment Mining

Coordinator Organization: Faculty of Information Science and Technology

Contact Person:
Assoc. Prof. Dr. Kalaiarasi Sonai Muthu & Mr Jaya Kumar Krishnan
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Jalan Ayer Keroh Lama
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With
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Thiruparamkundram, Madurai 625015,
Tamilnadu, India

Contact Person:
Dr. Deisy Chelliah
Associate Professor,
Department of Computer Science and Engineering,
Thiagarajar College of Engineering
Madurai, Tamilnadu

With best regards

Project Leader

DR. KALAIARASI SONAI ...
Associate Professor
Faculty of Information Science & Technology
Multimedia University
Jalan Ayer Keroh Lama
75450 Melaka

Project Manager

JAYA KUMAR A/L KRISHNAN
LECTURER
Faculty of Information Science & Technology
Multimedia University
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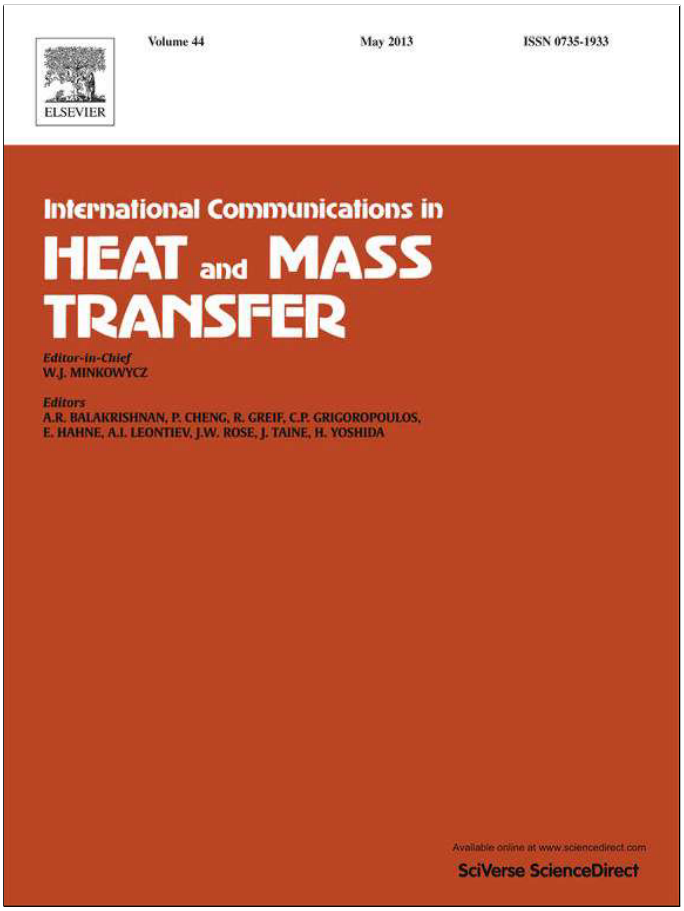

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International Communications in Heat and Mass Transfer

journal homepage: www.elsevier.com/locate/ichmt

Effect of conical cut-out turbulators with internal fins in a circular tube on heat transfer and friction factor ☆

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ARTICLE INFO

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Flow through circular tubes
Heat transfer enhancement
Friction factor
Conical turbulators
Humidification–dehumidification desalination system

ABSTRACT

Heat transfer, friction factor and thermal performance factor characteristics in a circular tube fitted with conical cut-out turbulator integrated with internal fins are investigated for three pitch ratios (PR) 3, 4, 5 and tested with two different arrangements as convergent mode (C-turbulators) and divergent mode (D-turbulators). The experiments were conducted with air as the working fluid and with Reynolds number range between 6800 and 9700 under constant heat flux of 0.052 W/m^2. The experimental results in the plain tube and the tube positioned with C-turbulators, D- turbulators are reported for comparison. It is found that the D-turbulators arrangement with PR = 3 shows the maximum heat transfer rate of 315%, thermal performance factor of 2.4 and friction factor of 3.2 times than that of plain tube. These enhancements may lead to an increase in heat transfer rate in the humidification–dehumidification desalination system, which is currently in stage. Results of existing Nusselt numbers are compared to the new predicted Nusselt number. These results agree well within 5–9% of error. Results were also compared with previous researchers work.

1. Introduction

The suitability of rectangular fins, square fins, circular inserts, strip type inserts and the conical turbulator as the enhancement devices for the air flow through pipes has been discussed elsewhere.

Promvonge et al. [1] have investigated the performance of conical nozzle turbulators (It is the cylinder with conical form) and, discussed the [2] conical nozzle turbulators with swirl generator fixed at the entry of the pipe for the enhancement of heat transfer for the same conditions. Yakut et al. [3] have investigated the effect of conical turbulators on the turbulent heat transfer, pressure drop and flow induced vibrations.

Anvari et al. [4] reported the effect of using conical turbulator on heat transfer and using water as the testing fluid. Promvonge et al. [5] studied the enhancement efficiency in a tube by using V turbulators (a set of converging–diverging nozzles like a venturi structure) at different pitch ratios (PR) and Eiamsa-ard et al. [6] analyzed the V turbulators with a snail entry in the circular tube for the similar conditions. Promvonge et al. [7] have also investigated the effect of heat transfer in combined conical ring and twisted tape for twist ratios ranging between 3.75 and 7.5. Ozceyhan et al. [8] numerically investigated the heat transfer enhancement in a tube with the circular cross sectional rings with pitch, (p) D/2, D, 3D/2, 2D, 3D. Kongkaitpaiboon et al. [9] have investigated the effect of heat transfer enhancement in perforated conical rings with various numbers of holes ranging 4, 6, and 8 with three different PR 4, 6 and 12. Lihua Guo et al. [10] analysed the tube with internal fins, in which the velocity and temperature distributions inside the tube were a function of the height and the number of fins. The Nusselt number increased with fin height. Zdaniuk et al. [11] analysed the helically finned tube and concluded that angle of fluid rotation increased with the increase of roughness and helix angle. Large fin thickness can cause the flow to stall in between the fins reducing the friction factor. Sujoy Kumar Saha [12] used the transverse ribs and wire coil inserts for the augmentation of heat transfer in rectangular and square duct in which friction factor increase with decrease in rib pitch. Hsieh et al. [13] investigated the effect of strip type inserts in a circular tube. The insert increases the wetted perimeter and reduces the flow cross sectional area.

In the above literature review, the heat transfer rate in an air heater was augmented by the conical turbulators alone or fins alone. The aim of this work is to investigate the effect of heat transfer and flow friction characteristics in a conical cut-out turbulators. This conical cut-out turbulator has the shape of a cone cut at the apex (Frustum). Inside the turbulator fins are attached in the radial direction to enhance the heat transfer rate. Two different positions convergent turbulator (C-turbulator) and divergent turbulators (D-turbulator) with PR of 3, 4, 5 for Reynolds number ranges of 6800 to 9700 are taken into analysis. The internal fins integrated with the conical

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Columbia University
IN THE CITY OF NEW YORK
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February 8, 2016

Ambassador/Consulate General of USA
Mumbai, India

Letter of Invitation and Guarantee
For Prof. Chandran Sundararaj and Prof. Balaji Gnanavel

This is to confirm that Prof. Balaji Gnanavel and Prof. Chandran Sundararaj are being invited as reviewers of the Urban Design Studio of the Graduate School of Architecture Planning and Preservation at Columbia University in New York. They are the Professors in-charge of the joint project between Columbia University and Thiagarajar College of Engineering (TCE) in Madurai. They were both a tremendous resource to the students when we visited Madurai in December 2015, and continue to work with us.

The joint projects between these two institutions is focusing on urban and landscape/ecological design issues dealing with rapid urbanization and possible ways to protect and restore the ecology of the Vaigai River and the elegant system of historic tanks which is now under threat from real estate pressures. We believe that Prof. Chandran and Prof. Balaji's input and comments to the students will be of great value to ensure that student work is of as much relevance to the community as possible.

We would like to invite them to work with us for 4 days between March 6 and April 30, 2016. Our Mid Term review is scheduled on March 7, and it will be very helpful if their visas can be processed before that. However, if more time if needed for processing their visa, we would like them to come as soon after this as possible.

The details of the invitees are given below:

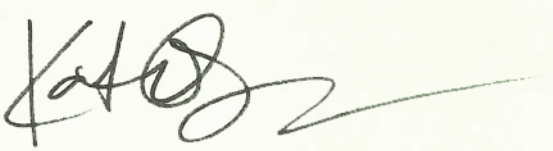
Prof. Chandran Sundararaj
Passport No: M2729604
Date of birth: May 2, 1975

Prof. Balaji Gnanavel
Passport No: N6645282
Date of birth: Feb 21, 1978

We will be responsible for all expenses relating to their visit during their stay in USA, as well as their return travel expenses. While in USA, we are making arrangements for their stay at the Hudson Hotel in New York located at 356 W 58th St, New York, NY 10019.

We also assure you that Prof. Chandran Sundararaj and Prof. Balaji Gnanavel will abide by all the laws and regulations of USA while here.

Yours sincerely,



Kate Orff
Associate Professor and Director of the Urban Design Program
Graduate School of Architecture, Planning and Preservation

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Generative methods and the design process: A design tool for conceptual settlement planning

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Settlement Planning

ABSTRACT

This paper implores the possible intervention of computers in the generative (concept) stage of settlement planning. The objective was to capture the complexity and character of naturally grown fishing settlements through simple rules and incorporate them in the process of design. A design tool was developed for this purpose. This design tool used a generative evolutionary design technique, which is based on multidisciplinary methods. Facets of designing addressed in this research are:

- allocation of each design element's space and geometry,
- defining the rules, constraints and relationships governing the elements of design,
- the purposeful search for better alternative solutions,
- quantitative evaluation of the solution based on spatial, comfort, complexity criterions to ensure the needed complexity, usability in the solutions.

Generative design methods such as geometric optimization, shape grammars and genetic algorithms have been combined for achieving the above purposes.

The allocation of space has been achieved by geometric optimization techniques, which allocate spaces by proliferation of a simple shape unit. This research conducts an analysis of various naturally grown fishing settlements and identifies the features that would be essential to recreate such an environment. Features such as the essential elements, their relationships, hierarchy, and order in the settlement pattern, which resulted due to the occupational and cultural demands of the fisher folk, are analysed. The random but ordered growth of the settlement is captured as rules and relations. These rules propel and guide the whole process of design generation.

These rules and certain constraints, restrictions control the random arrangement of the shape units. This research limits itself to conducting exhaustive search in the prescribed solution search space defined a priori by the rules and relationships. This search within a bounded space can be compared to the purposeful, constrained decision making process involved in designing.

The generated solutions use the evolutionary concept of genetic algorithms to deduce solutions within the predefined design solution search space. Simple evolutionary concepts such as reproduction, crossover and mutation aid this search process. These concepts transform by swapping/interchanging the genetic properties (the constituent data/material making up the solution) of two generated solutions to produce alternate solutions. Thus the genetic algorithm finds a series of new solutions. With such a tool in hand various possibilities of design solutions could be analysed and compared. A thorough search of possible solutions ensures a deeper probe essential for a good design.

The spatial quality, comfort quality of the solutions are compared and graded (fitness value) against the standard stipulations. These parameters look at the solution in the context of the whole and not as parts and most of these parameters could be improved only at the expense of another. The tool is able to produce multiple equally good solutions to the same problem, possibly with one candidate solution optimizing one parameter and another candidate optimizing a different one. The final choice of the suitable solution is made based on the user's preferences and objectives.

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TCE

Dr D Jeya Mala <djmcse@tce.edu>

STC 2013_Regional Qualifying Rounds Details_Chennai

Vasundhara Kumar[QAI] <vasundhara.kumar@qaiglobal.com> Tue, Oct 8, 2013 at 4:23 PM
To: djmcse@tce.edu

Dear Author(s),

Greetings from Team STC 2013!

Firstly, we would like to thank you for your submission and congratulations for your selection in the Regional Qualifying Rounds for **Best of the Best – Testing Leadership Awards for STC 2013.**

[Please note that the date for the Regional Qualifying Round has been re-scheduled to**19th October, 2013.]**

In all we had received a total of 587+ submissions from across the globe. We believe that the process for screening would be a tough, considering the quality of content submitted to us. After an initial screening of **351+** submissions, **47** papers & practices have been selected for participating in the regional qualifying rounds at **Chennai** under various categories.

The schedule for your Regional Qualifying Round is confirmed as per the following details. Please read the guidelines carefully and abide by them.

DATE	19.OCT.2013 [Saturday]	TIMINGS	3:00:00 PM
PANEL NO.	C01	CITY	Chennai
CATEGORY	Techniques & Tools	ID NO.	500
PAPER TITLE	JImpact Arbiter - An Automated Tool to test Fault Prone Components using Hybrid Genetic Algorithm-based Approach		
AUTHOR(S)	JEYA MALA Sabarinathan		
VENUE ADDRESS	**Cognizant Technology Solutions** Plot No H-4, Sipcot IT Park, Old Mahabalipuram Road, Siruseri, Chennai – 603103 Landmark: CTS/ Cognizant - Old Building *Click here for Google Map. See balloon 'F'.*		

QAI COORDINATOR	Saravanan R. | +91 9840401130 | saravanan.r@edistatesting.com
HOST COORDINATOR	Madhvi Kumar | +91 91768 08756 | madhvi.kumar@cognizant.com
INSTRUCTIONS	▪ All presentations should be uploaded at https://edistatesting.wufoo.com/forms/stc-2013-regional-round-presentation/ till 14.OCT.2013 ▪ Each individual presenter is provided 15 minutes to present their topic, and the content. This includes Q&A. ▪ The presentation shall be primarily in a power point format. ▪ DO NOT call host coordinators for any queries related to the regional rounds. They are ONLY to help and coordinate the regional rounds in this city on the event day. ▪ The decision to accept late attendees is completely left to the choice of the jury. ▪ For ad-hoc situation please keep a copy of your presentation on your e-mail id. ▪ Please notify stc@qaiglobal.com for any changes by end of day on 9th October, 2013. ▪ No hard drives or external disks, etc. are allowed inside the venue premises. Hence it is imperative to submit your presentation within the due date. ▪ Late submissions will not be entertained under any circumstances. ▪ Please carry a photo identity card to the venue along with a print out of this confirmation e-mail. ▪ Decision of the Jury Panel will be absolute.

We sincerely thank you for your support once again.
Should you require any further clarifications, please feel free to contact me at anytime.

Thanks & Regards,
Vasundhara Kumar
Manager - Conferences & Certifications

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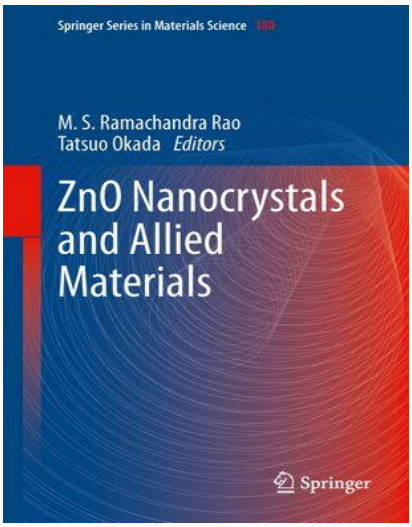

ZnO Nanocrystals and Allied Materials
ZnO Nanocrystals and Allied Materials pp 247-268| Cite as

Synthesis and Characterization of ZnO-Based Phosphors and Related Phosphor Composites in Bulk, Thin Film and Nano Form

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Abstract

Phosphors are light emitting solids that play an important role in the lighting industry. The physics of doping suitable elements plays an equally important role in controlling the emission properties. The choice of host lattice is the key in controlling the charge transfer mechanism. Zn_2SiO_4 is a useful host material, and in this chapter we discuss on the effect of doping in various forms of this host material. Zn_2SiO_4:Mn powder (bulk)

phosphors have been synthesized by sol–gel [1] and solid-state method, and thin films grown by pulsed laser deposition [2]. The optimization parameters like growth temperature, vacuum, and oxygen partial pressure (in case of thin films) that determine the luminescent efficiency of the phosphors will be highlighted. The defect and its related emission in ZnO encapsulated SiO_2nanocomposites [3] synthesized using urea assisted sol–gel techniques projecting toward the fabrication of UV-LED pumped white LED will be discussed in detail.

Keywords

Charge Transfer Band Zinc Nitrate SiO2 Matrix Defect Emission SiO2 Nanocomposites
These keywords were added by machine and not by the authors. This process is experimental and the keywords may be updated as the learning algorithm improves.

Thiagarajar college of Engineering

Library

NITTR chennai, and TCE library organized one day International seminar on Information literarcy for Technical education on 17.01.2014

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Mail your registration details to the coordinators.

REGISTRATION FEE

A Registration fee of Rs.300/-

Spot registration Timing: 8.30-10.00 am.

NITTTR, CHENNAI : The National Institute of Technical Teachers Training and Research (NITTTR) Chennai was established as an autonomous Institute by the Ministry of Human Resource Development, Government of India in the year 1964 to improve the quality of Technical and Vocational Education and Training (TVET) system in India and in the Southern Region in particular. Within this mandate, the institute takes initiatives to offer need based Human Resource Development programmes through appropriate modes and develop curricula and instructional resources. It also fosters research in the inter disciplinary area of Engineering Education and offers consultancy and extension services for the total development of Engineering Colleges, Polytechnic Colleges, Vocational institutions, Industry, Service sector and the Community at large.

TCE, Madurai: Thiagarajar College of Engineering (TCE), Madurai, an ISO 9001:2008 certified Institution affiliated to Anna University is one among the several educational and philanthropic institutions founded by Philanthropist and Industrialist Late. Shri. Karumuttu Thiagarajan Chettiar. It was established in the year 1957. TCE is funded by Central & State Governments and Management. The courses offered in TCE are approved by the All India Council for Technical Education, New Delhi. It was granted Autonomy in the year 1987. TCE offers Seven Undergraduate Programmes, Fourteen Postgraduate Programmes and Doctoral Programmes in Engineering, Science and Architecture.. The courses offered are accredited by the National Board of Accreditation.

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ON

INFORMATION LITERACY
FOR TECHNICAL EDUCATION

17th January 2014
@
Thiagarajar College of Engineering, Madurai

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BACKGROUND

In today's environment, social media rules the information airways and we are all consumed and/or overwhelmed by the daily torrents of information coming at us from all directions. All we really needed a mastery of basic literacy in order to benefit from having access to information resources. Information literacy enables people to interpret and make informed judgments as users of information sources, as well as to become producers of information in their own right. Information literate people are able to access information about their health, their environment, their education and work, empowering them to make critical decisions about their lives, e.g. in taking more responsibility for their own health and education.

In a digital world, information literacy requires users to have the skills to use information and communication technologies and their applications to access and create information. For example, the ability to navigate in cyberspace and negotiate hypertext multimedia documents requires both the technical skills to use the Internet as well as the literacy skills to interpret the information.

As such, every individual should develop the skills to find, evaluate, and use information effectively, in addition to discerning what is and what is not credible and authentic, has become more important now than at any other time in the human history.

OBJECTIVES

The broad objective of this international workshop is to provide a suitable forum to:

- Discuss the importance of information literacy and its principle
- Determine the nature and extent of the information needed.
- Accesses needed information effectively and efficiently.
- Evaluates information and its sources critically and incorporates selected information into knowledge base and value system.
- Apply knowledge management practices in Technical Education System
- Design teaching and learning systems for knowledge management
- Develop Knowledge-Based Teaching and Learning System

OVERVIEW OF THE WORKSHOP

With the above objectives in mind, NITTTR, Chennai, organizes this international seminar in collaboration with Thiagarajar College of Engineering, Madurai. This seminar includes lectures by eminent speakers who work in the area of Information literacy. Twenty three participants from different countries namely Nigeria, Cambodia, Zambia, Ethiopia, Vietnam, etc., are participating in this deliberation.

TEQIP sponsored International Seminar

On

Information Literacy for Technical Education

@

17th January 2014

Venue: KS Auditorium, Thiagarajar College of Engineering Madurai

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2. Designation, Department and Address of the College :

3. Academic Qualification :

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Date: Signature of the Applicant

List of participants for abroad and India

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Ref: TCE/LIB/TEQIP-II/FDP/AS

Name of the Programme: International seminar on Information Literacy for technical education

Date:17/01/2014

Attendance sheet

Sl.No.	Name of the participant	Institution	Designation	Signature	
				FN	AN
1	Dr. R. RAVICHANDRAN	NITTTR, CHENNAI	Sr. Library		
2	BWANGO, BARNABAS	IAE, DARES SALAAM	Librarian		
3	Eman George Abdallah	Birzeit University Palestine	Librarian		
4.	LEBOGANG GOPOLANG	BOTSWANA COLLEGE OF AGRICULTURE	ASSISTANT LIBRARIAN		
6.	Trinh Thi Thuy	Haiphong General Science Library Vietnam.	librarian		
7	JOSEPHINE WILFRED OGONDIEK	UNIVERSITY OF DODOMA-TANZANIA	ASSISTANT LIBRARIAN		
8.	BWALYA TUESDAY	UNIVERSITY OF ZAMBIA	LECTURER		
9.	ASabe Ahmed	NASARAWA STATE POLYTECHNIC NIGERIA	LIBRARY OFFICER		
10	Ganiyat Tiamiyu	Univ. of Professl studies, Ghana	Prin. Lib. Assistant		
11.	ZAR KHYI SOE	Hluttaw office. in Myanmar.	staff-officer		
12.	Nan Nwe Theingi	I. P. R. D (Ministry of Information) Myanmar	Deputy staff officer	Theingi	Theingi
13	ENIAYEKAN ADEOLU	MINILS Resource Centre (NIGERIA)	LIBRARY OFFICER		
14.	Yolanda B. Solmayor	Claveria School of Arts and Trades	School Librarian III		
15	Jessielyn E. Nodreza	POTOTAN PILOT ELEMENTARY SCHOOL	LIBRARIAN		

Signature of the Coordinator

Le. 2M

THIAGARAJAR COLLEGE OF ENGINEERING, MADURAI – 625 015

(A Govt. Aided ISO 9001 – 2008 Certified, Autonomous Institution Affiliated to Anna University)

LIBRARY

Ref: TCE/LIB/TEQIP-II/FDP/AS

Name of the Programme: International seminar on Information Literacy ~~on~~ for technical education

Date:17/01/2014

Attendance sheet

Sl.No.	Name of the participant	Institution	Designation	Signature	
				FN	AN
16	HAMAD OMAR JUMA	Institute of Public Adm. ZBAR	Library Assistant		
17.	MD. ABU DAUD	The National Library of Bangladesh	Senior Technical Assistant (Lib.)		
18	MOHD. ADRISS HASAN,	The National Gallery of Afghanistan	General Professional Manager		
19	SOLOMUN MEKONNEN	Addis Ababa University	Librarian		
20	DAWIT MULUGETA	ADDIS ABABA UNIVERSITY	Librarian		
21	KYAW KHAING TUN	National Library of Myanmar	Assistant Library		
22	P. MOHANADEVI	M Madurai Kamaraj University	M.L.I.Sc IInd year	P. Mohanadevi	P. Mohanadevi
23.	SAKTHI RENUGADEVI	Thiagarajar College of Engineering	Library Assistant	Renugadevi	Renugadevi
24.	L. Radha.	Thiagarajar Coll. of Eng.	Librarian	L. Radha	L. Radha
25.	S. Deepa	Thiagarajar Coll of Engg.	Lib. Asst	S Deepa	S Deepa
26.	M Regis	Thiagarajar College Engg	Lib Assistant	M Regis	M Regis
27.	V. Swarnarougi	Thiagarajar college of Engineering	Lib Assistant	V. Swarnarougi.	V. Swarnarougi.
28.	S. SUNDARAMOORTHY	Thiagarajar college of Engineering	Library Asst	S. Sundaramoorthy	S. Sundaramoorthy
29.	S. SUDHAHAR	Thiagarajar College of Engg.	Lib. Asst.	S. Sudhahar	S. Sudhahar
30.	R.V. ARUMUGAM	TCE. Madurai	Lib. Asst	R.V. Arumugam	R.V. Arumugam

Signature of the Coordinator

L. Radha

THIAGARAJAR COLLEGE OF ENGINEERING, MADURAI – 625 015

(A Govt. Aided ISO 9001 – 2008 Certified, Autonomous Institution Affiliated to Anna University)

LIBRARY

Ref: TCE/LIB/TEQIP-II/FDP/AS

Name of the Programme: International seminar on Information Literacy ~~on~~ for technical education

Date:17/01/2014

Attendance sheet

Sl.No.	Name of the participant	Institution	Designation	Signature	
				FN	AN
31	MARYAM ADAMU K MAISHANU	NITTTR	Chief Librarian		
32	CHHOY POR	NITTTR	Study Library		
33	LE VAN MINH	NITTTR			
34	P. SATHISH KUMAR	TCG	Lib.Assit	P. Sathish	P. Sathish
35	MURUGAN. V.R	VIT	Librarian.		
36	P. Nagarajan	TCE	Asst	P. Nagarajan	P. Nagarajan

Signature of the Coordinator

Photo taken during Int. seminar

KIT | Kanazawa Institute of Technology

June 7, 2018

Dr. Baskar Subramanian
Professor, Electrical and Electronics Engineering
Thiagarajar College of Engineering

Invitation to the 14th International CDIO Conference in KANAZAWA

Dear Dr. Baskar Subramanian

Kanazawa Institute of Technology (KIT) is pleased to announce that we are jointly organizing the 14th International CDIO Conference in KANAZAWA with International College of Technology (ICT). The theme of the conference is “Innovations in Engineering Education”.

In this conference, CDIO collaborating institutions gather to exchange ideas and experiences, review developments at each institution, assess the Initiative's progress and further refine the project. The meetings offer many opportunities to learn about CDIO and to discuss its implementation in new locations.
For more details, please visit our CDIO site http://www.kanazawa-it.ac.jp/cdio2018/ .

We look forward to meeting you and sharing our collective experience of implementing CDIO, and together exploring ways in which our curriculum practices can make the learning of engineering most relevant and interesting for our students.

On behalf of the KIT and ICT community, I would like to cordially invite you to attend the above mentioned meeting. I believe you will find this program to be of great value to your understanding and implementation of CDIO.

If you have any questions and requests, please feel free to contact the organizing committee of the forth-coming meeting.

Sincerely yours,

鹿田正昭

Masaaki Shikada
14th International CDIO Conference Chair
Vice President
Kanazawa Institute of Technology

7-1 Ohgigaoka, Nonoichi,
Ishikawa 921-8501 Japan
Tel. +81-76-248-1100

www.kanazawa-it.ac.jp

Indian Academy of Sciences
Bengaluru

Indian National Science Academy
New Delhi

The National Academy of Sciences, India
Allahabad

SUMMER RESEARCH FELLOWSHIP PROGRAMME

CERTIFICATE

This is to certify that Mr S G Abines worked on a project entitled "Simulation of grid-connected three phase PV inverter along with battery storage" during June - July 2018 as a Summer Research Fellow under the supervision of Dr B Subba Reddy, Indian Institute of Science, Bengaluru. The Summer Research Fellowship Programme is jointly sponsored by IASc (Bengaluru), INSA (New Delhi) and NASI (Allahabad). During the period of this fellowship, he also attended the two-day Mid-year Meeting of scientific lectures (29 - 30 June 2018) held at Infosys Development Center, Mysuru.

M.R.N. Murthy
Chairman, Science Education Panel

Place: Bengaluru
Date: 27-07-2018

INDIAN ACADEMY OF SCIENCES
P.B. No. 8005, C.V. Raman Avenue, Sadashivanagar P.O., Bengaluru 560 080, India
Email: sumfel@ias.ernet.in

Certificate of Appreciation

This is to certify that

Kavitha D

was a 'Mentor' in the AICTE approved Faculty Development Programme (FDP101x) on

Foundation Program in ICT for Education

conducted by Indian Institute of Technology Bombay
from August 3, 2017 to September 7, 2017

(Online activity from Thursday 03 August 2017 to Thursday 7 September 2017 and physical participation at Remote Center on 19 and 20 August 2017, together considered as a two-week equivalent FDP course)

This FDP was held under the aegis of Pandit Madan Mohan Malaviya National Mission for Teachers and Teaching (PMMMNMTT), MHRD, GoI

Phatak.

Prof. Deepak B. Phatak
Project and Course Coordinator
IIT Bombay

Certificate of Appreciation

This is to certify that

Kavitha D

was a 'Mentor' in the AICTE approved Faculty Development Programme (FDP201x) on

Pedagogy for Online and Blended Teaching-Learning Process

conducted by Indian Institute of Technology Bombay
from September 14, 2017 to October 12, 2017

(Online activity from Thursday 14 September 2017 to Thursday 12 October 2017 and physical participation at Remote Center on 16, 17 September and 7, 8 October 2017, together considered as a two-week equivalent FDP course)

This FDP was held under the aegis of Pandit Madan Mohan Malaviya National Mission for Teachers and Teaching (PMMMNMTT), MHRD, GoI

Prof. Deepak B. Phatak
Project and Course Coordinator
IIT Bombay

Certificate of Excellence

This is to certify that

Kavitha D

Successfully completed an AICTE approved Four-week Faculty Development Programme (FDP) on

Use of ICT in Education for Online and Blended Learning

Conducted by Indian Institute of Technology Bombay
from May 2nd, 2016 to July 10th, 2016
and
is amongst the top performers of the programme (Top 253 out of 4051 registered participants),
and is conferred an "Award of Excellence" sponsored by SAP India Pvt. Ltd.

(Online activity equivalent to three week from Monday 2 May to Sunday 10 July 2016 and Physical participation at Remote Center on 14, 15 May; 4, 5 June; 25 and 26 June 2016)

This FDP was held under the National Mission on Education through ICT (MHRD), and was funded by SAP India Pvt. Ltd through CSR grants.

Prof. Deepak B. Phatak
Project and Course Coordinator
IIT Bombay

Certificate of Appreciation

This is to certify that

Thangavel M

was a 'Mentor' in the AICTE approved Faculty Development Programme (FDP201x) on

Pedagogy for Online and Blended Teaching-Learning Process

conducted by Indian Institute of Technology Bombay
from September 14, 2017 to October 12, 2017

(Online activity from Thursday 14 September 2017 to Thursday 12 October 2017 and physical participation at Remote Center on 16, 17 September and 7, 8 October 2017, together considered as a two-week equivalent FDP course)

This FDP was held under the aegis of Pandit Madan Mohan Malaviya National Mission for Teachers and Teaching (PMMMNMTT), MHRD, GoI

Phatak.

Prof. Deepak B. Phatak
Project and Course Coordinator
IIT Bombay

Certificate of Appreciation

This is to certify that

Thangavel M

was a 'Mentor' in the AICTE approved Faculty Development Programme (FDP101x) on

Foundation Program in ICT for Education

conducted by Indian Institute of Technology Bombay
from August 3, 2017 to September 7, 2017

(Online activity from Thursday 03 August 2017 to Thursday 7 September 2017 and physical participation at Remote Center on 19 and 20 August 2017, together considered as a two-week equivalent FDP course)

This FDP was held under the aegis of Pandit Madan Mohan Malaviya National Mission for Teachers and Teaching (PMMMNMTT), MHRD, GoI

Prof. Deepak B. Phatak
Project and Course Coordinator
IIT Bombay

Indian Institute of Information Technology
Design and Manufacturing, Kancheepuram
Chennai - 600127

Teaching Learning Centre for Design & Manufacturing Education

MHRD Pandit Madan Mohan Malaviya National Mission for Teachers and Teaching

Certificate of Internship

This is to certify that Mr/Ms SHANSHKRUTHAN.R.A of Thiagarajar College of Engineering, Madurai has completed the internship on Do-It-Yourself (DIY) 3D Scanner during 04/06/18 to 12/07/18 in the Teaching Learning Centre at our Institute.

Dr. S. R. Pandian
Coordinator
TLC IIITDM

TEACHING LEARNING CENTRE

Indian Institute of Technology Madras

This is to certify that

Ashok Kumar B

Thiagarajar College of Engineering, Madurai

has participated in the

Faculty Development Programme on Learning Improvement Techniques

organized and conducted by **Teaching Learning Centre, IIT Madras**

from **21st to 23rd April 2016**

Dr. Rajeev Sukumaran
Course Coordinator

Dr. Edamana Prasad
Head, Teaching Learning Centre

प्रमाणपत्र संख्या Certificate No: 391/14

दक्षिण रेलवे

SOUTHERN RAILWAY

मूल प्रशिक्षण केन्द्र / BASIC TRAINING CENTRE

केन्द्रीय कर्मशाला, गोल्डन रॉक / CENTRAL WORKSHOPS, GOLDENROCK

(आई.एस.ओ.9001:2000,14001:2004 व ओ.एस.एच.ए.एस 18001:2007 प्रमाणित कर्मशाला)
(AN ISO 9001 : 2000, 14001 : 2004 & OSHAS 18001 : 2007 CERTIFIED WORKSHOP)

तिरुच्चिराप्पल्ली / Tiruchirappalli-620 004.

प्रमाण-पत्र / CERTIFICATE

यह प्रमाणित किया जाता है कि श्री/श्रीमती/कुमारी _____ आत्मज/आत्मजा _____ ने, जो _____ के छात्र/छात्रा है. दिनांक _____ से _____ तक की अवधि में केन्द्रीय कर्मशाला, दक्षिण रेलवे, पोनमलै 620 004 में _____ के विषय पर परियोजना कार्य पूरा किया है.

This is to certify that Shri/ Smt/Ms N.R. AKARSHIKA

S/o./D/o. N.K. RAJENDRAN *Student of* B.E, EEE

THIAGARAJAR COLLEGE OF ENGINEERING

has done a project on the topic of MODERNIZATION OF AIR-CONDITIONING METHOD IN RAILWAY AC COACHES USING PLC *during the period*

From 15.12.2014 *to* 27.12.2014 *in Central Workshops, Southern Railway Ponmalai - 620 004*

BASIC TRAINING CENTRE PONMALAI

दिनांक DATE: 27.12.2014

प्राचार्य/मू.प्र.के/पोनमलै
PRINCIPAL/ BTC /GOC

प्रमाणपत्र संख्या Certificate No: 343 /14

दक्षिण रेलवे

SOUTHERN RAILWAY

मूल प्रशिक्षण केन्द्र / BASIC TRAINING CENTRE

केन्द्रीय कर्मशाला, गोल्डन रॉक / CENTRAL WORKSHOPS, GOLDENROCK

(आई.एस.ओ.9001:2000,14001:2004 व ओ.एस.एच.ए.एस 18001:2007 प्रमाणित कर्मशाला)

(AN ISO 9001 : 2000, 14001 : 2004 & OSHAS 18001 : 2007 CERTIFIED WORKSHOP)

तिरुच्चिराप्पल्ली / Tiruchirappalli-620 004.

प्रमाण-पत्र / CERTIFICATE

यह प्रमाणित किया जाता है कि श्री/श्रीमती/कुमारी _____ आत्मज/आत्मजा _____ ने, जो _____ के छात्र/छात्रा है. दिनांक _____ से _____ तक की अवधि में केन्द्रीय कर्मशाला, दक्षिण रेलवे, पोनमलै 620 004 में _____ के विषय पर परियोजना कार्य पूरा किया है.

This is to certify that Shri/Smt/Ms S. ALAMU

S/o./D/o. M. SUNDARAM *Student of* B.E. EEE

THIAGARAJAR COLLEGE OF ENGINEERING

has done a project on the topic of MODERNIZATION OF AIR-CONDITIONING METHOD IN RAILWAY AC COACHES USING PLC *during the period from* 15.12.14 *to* 27.12.14 *in Central Workshops, Southern Railway Ponmalai - 620 004*

दिनांक / DATE: 27.12.2014

प्राचार्य/मू.प्र.के/पोनमलै

PRINCIPAL/ BTC /GOC

प्रमाणपत्र संख्या Certificate No: 399 /14

दक्षिण रेलवे

SOUTHERN RAILWAY

मूल प्रशिक्षण केन्द्र / BASIC TRAINING CENTRE

केन्द्रीय कर्मशाला, गोल्डन रॉक / CENTRAL WORKSHOPS, GOLDENROCK

(आई.एस.ओ.9001:2000,14001:2004 व ओ.एस.एच.ए.एस 18001:2007 प्रमाणित कर्मशाला)

(AN ISO 9001 : 2000, 14001 : 2004 & OSHAS 18001 : 2007 CERTIFIED WORKSHOP)

तिरुच्चिराप्पल्ली / Tiruchirappalli-620 004.

प्रमाण-पत्र / CERTIFICATE

यह प्रमाणित किया जाता है कि श्री/श्रीमती/कुमारी _____ आत्मज/आत्मजा _____ ने, जो _____ के छात्र/छात्रा है. दिनांक _____ से _____ तक की अवधि में केन्द्रीय कर्मशाला, दक्षिण रेलवे, पोनमलै 620 004 में _____ के विषय पर परियोजना कार्य पूरा किया है.

This is to certify that Shri/Smt/Ms A. DHARANI. *S/o./D/o.* J. AJOY KUMAR. *Student of* B.E, EEE THIAGARAJAR COLLEGE OF ENGINEERING. *has done a project on the topic of* MODERNIZATION OF AIR-CONDITIONING METHOD IN RAILWAY AC COACHES USING PLC *during the period from* 15.12.14 *to* 27.12.14 *in Central Workshops, Southern Railway Ponmalai - 620 004*

दिनांक / DATE: 27 DEC 2014

प्राचार्य/मू.प्र.के/पोनमलै

PRINCIPAL/ BTC /GOC

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

DESIGN & DEVELOPMENT OF BATTERY CHARGER FOR EV APPLICATION

is a bonafide work of

V HEMAVATHY

REG NO: 11E37

8th SEMESTER B.E.ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING,

MADURAI

who has successfully carried out the project work between DECEMBER2014 and MARCH2015 under my supervision.

Mr A SRIKUMAR

LEAD ENGINEER

ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

DESIGN & DEVELOPMENT OF MOTOR CONTROLLER FOR EV APPLICATION

is a bonafide work of

S BALAGANESH	**S PAVITHRA**
REG NO: 11E20	**REG NO: 11E69**

8th SEMESTER B.E.ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING,

MADURAI

who have successfully carried out the project work between DECEMBER2014 and MARCH2015 under my supervision.

31/3/2015

.....

Mr AVINASH

MEMBER R&D

ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

DESIGN & DEVELOPMENT OF INSTRUMENT CLUSTER & WIRING HARNESS

is a bonafide work of

A PRAVEEN KUMAR
REG NO: 11E75

P THILAGAVATHY
REG NO: 11E115

8th SEMESTER B.E.ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING,

MADURAI

who have successfully carried out the project work between DECEMBER2014 and MARCH2015 under my supervision.

Mr PARTHA BISWAS
MEMBER R&D
ADVANCED ENGINEERING GROUP

Mr AMARDEEP KUMAR
MEMBER R&D
ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

This is to certify that the project on,

ILLUMINATION SYSTEM FOR TWO WHEELERS

is a bonafide work of

K SANJANA

REG NO: 11E93

8th SEMESTER B.E.ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING,

MADURAI

who has successfully carried out the project work between DECEMBER2014 and MARCH2015 under my supervision.

.....

Mr ABHISHEK GUPTA

MEMBER R&D

ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

Design & Development of Motor for EV Application

Is a bonafide work of

DHIYANESH R

REG NO: 11E30

RM KABILA

REG NO: 11E43

8th SEMESTER B.E.ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING,

MADURAI

Who have successfully carried out the project work between DECEMBER 2014 and MARCH 2015 under my supervision.

01/04/15

Mr YOGESH DEVIDAS PATIL

MEMBER R&D

ADVANCED ENGINEERING GROUP

CERTIFICATE

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

MOTOR CONTROLLER FOR AUTONOMOUS VEHICLE

is a bonafide work of

N. K. JEEVAN

REGNO:11E41

8th SEMESTER B.E.ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING,

MADURAI

who has successfully carried out the project work between DECEMBER2014 and MARCH2015 under my supervision.

for A. Sukla

.....

Mr K. N.SHREENIVASAPRASADA

PED- MACHINE BUILDING

Rane TRW Steering Systems Pvt. Ltd.

Rane
Expanding Horizons
TRW

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Boothakudi Village Viralimalai - 621 316.
Pudukkottai District, INDIA
Website: www.rane.co.in
Telephone: 9894633341, 9894633342
Facsimile : 04339 - 220273
CIN: U35999TN1987PTC014600

02.04.2016

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms.Shri Sahana J (12E93), Final Year student of the B.E., Electrical & Electronics Engineering from Thiagarajar College of Engineering, Madurai has done internship in our Organization from **06th January 2016 to 1st April 2016.** During her internship she had also done a project work titled "Variable Load Constant Speed DC Motor for ESS"

For Rane TRW Steering Systems Pvt. Ltd.

M.Mohan
General Manager – HR

Regd. Office : 'Maithri', 32, Cathedral Road, Chennai 600 086. India. Tel. 91.44.28112472 Fax : 91.44.28112449
Head Office : 45, T.T.K. Road, Alwarpet, Chennai 600 018. INDIA. Tel. 91.44.24994390 Fax : 91.44.24994409

i|nautix.
A BNY MELLON COMPANY

iNautix Technologies
10th Floor, Tidel Park
No 4, Rajiv Gandhi Salai
Taramani, Chennai-600113

MR.J.BRITTO PARI Date : 20 / 04 / 2016

CERTIFICATE

Certified that project titled ***"FPGA Implementation of Reconfigurable Modulators"***, is a bonafide work done under my supervision during January 2016 to April 2016, by **JEYAPRAKASH.C, SARAVANAPRIYA.T, NUGANYA P.K,** final year Electrical and Electronics Engineering students of ***Thiagarajar College of Engineering, Madurai, Tamil Nadu***, in partial fulfillment for the requirement of B.E. degree in Electrical & Electronics Engineering of Anna University.

J. B. Pari
Dr.J.Britto Pari
(Project incharge)

TVS MOTOR COMPANY LTD, HOSUR

This is to certify that the project on,

BODY CONTROL MODULE FOR 110cc SCOOTER ENGINE

is a bonafide work of

K HARIGOVINDH

REG NO: 12E31

8th SEMESTER B.E.ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING,

MADURAI

who has successfully carried out the project work between DECEMBER2015 and APRIL2016 under my supervision.

.....

Mr S SARMADH AMEER

MEMBER R&D

ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

This is to certify that the project on,

BODY CONTROL MODULE FOR 110cc SCOOTER ENGINE

is a bonafide work of

N PERIYASAMY

REG NO: 12E66

8th SEMESTER B.E.ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING,

MADURAI

who has successfully carried out the project work between DECEMBER2015 and APRIL2016 under my supervision.

.....

Mr S SARMADH AMEER

MEMBER R&D

ADVANCED ENGINEERING GROUP

embedUR

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BONAFIDE CERTIFICATE

This is to certify that project titled ***"Radio Resource Management in Wireless Local Area Network"***, is a bonafide work done under my supervision during January 2016 to April 2016, by ***K.R .Sowmiya,*** final year Electrical and Electronics Engineering student of ***Thiagarajar College of Engineering, Madurai, Tamil Nadu***, in partial fulfillment for the requirement of B.E. Degree in Electrical & Electronics Engineering of Anna University.

Date: 18-04-2016

Signature of the Guide

18/04/16

R. Mohan Raj
Senior Engineering Manager

+91-44-42132080 | info@embedur.com | www.embedur.com

embedUR systems (India) Pvt. Ltd. | 5th Floor, JVL Plaza, 626/501, Anna Salai, Teynampet, Chennai – 600 018

Nautix.
A BNY MELLON COMPANY

Address: Tidel Park, Canal Bank Road,
Taramani, Chennai, Tamil Nadu 600113
Phone: 07702983947

Mr. J. BRITTO PARI Date : 07.04.2016

CERTIFICATE

Certified that project titled **"Optimised Architecture of Fast Fourier Transform"**, is a bonafide work done under my supervision during January 2016 to April 2016, by **M.CHANDHIYA** and **S.VIMALA RANI,** final year Electrical and Electronics Engineering student of **Thiagarajar College of Engineering, Madurai, Tamil Nadu**, in partial fulfillment for the requirement of B.E. degree in Electrical & Electronics Engineering of Anna University.

J.B.P. 7.04.16

BONAFIDE CERTIFICATE

This is to certify that project titled ***"Radio Resource Management in Wireless Local Area Network"***, is a bonafide work done under my supervision during January 2016 to April 2016, by ***R. Prem Kumar,*** final year Electrical and Electronics Engineering student of ***Thiagarajar College of Engineering, Madurai, Tamil Nadu***, in partial fulfillment for the requirement of B.E. Degree in Electrical & Electronics Engineering of Anna University.

Date: 18-04-2016

Signature of the Guide

18.04.16

R. Mohan Raj
Senior Engineering Manager

ZOHO Corporation Private Limited
Estancia IT Park, Plot No.140, 151,
Vallancheri Village, Chengalpet Taluk,
Kancheepuram District - 603 202 Tamilnadu.
Ph: +91- 44 - 6744 7070, Fax: +91- 44 - 2270 7172
www.zohocorp.com

April 6th, 2016

Ref :99/PT-648/16

PROJECT COMPLETION CERTIFICATE

This is to certify that **Mr. Arun Raj T**(Reg. No.:12E11) final year **EEE** Department of **Thiagarajar College Of Engineering**, has successfully completed his internship in **ZOHO Corporation Pvt. Ltd., with title 'Offline Survey For the Product ZOHO Survey'**from November 2015(23-Nov-15) to April 2016(1-Apr-16). During the above period, his performance and conduct were found to be good.

ZOHO CORPORATION PRIVATE LIMITED
Kancheepuram District 603 202.

Selvanathan

(Manager)

Mohammed Sohail

(Manager – HR)

TEMENOS
The Banking Software Company

TEMENOS INDIA PVT LTD

No 146 Sterling Road
Nungambakkam
Chennai 600 034
India

T: +91 (0) 44 6623 1000
F: +91 (0) 44 6623 1099

www.temenos.com
CIN - U30006TN1995PTC032883

12th April 2016

TO WHOM IT MAY CONCERN

This is to certify that Ms. Meenatchi, D/O- Mr. Manickavasagam, a student of B.E (Major [illegible]rical and Electronics Engineering), Thiagarajar College of Engineering, Madurai, [illegible] Nadu, is doing her internship project titled ***""Database Scripts Generator and [illegible] Tool""***, is a bonafide work done under supervision of Palaniyandi Kumaresan, [illegible], Private Wealth Management at our perungudi Branch from December 2015. [illegible] internship programme will end on April 2016

[illegible] India Pvt Ltd.

[illegible] Kathiram T
[illegible] - Human Resources

Nautix.
A BHE MELLON COMPANY

Address: Tidel Park, Canal Bank Road,
Taramani, Chennai, Tamil Nadu 600113
Phone:07702983947

Mr.J.BRITTO PARI

Date : 07.04.2016

CERTIFICATE

Certified that project titled ***"Frequency Hopping Synthesizer"***, is a bonafide work done under my supervision during January 2016 to April 2016, by ***M.PRIYADHARSINI*** and ***R.VARSHINI***, final year Electrical and Electronics Engineering student of ***Thiagarajar College of Engineering, Madurai, Tamil Nadu*** in partial fulfillment for the requirement of B.E. degree in Electrical & Electronics Engineering of Anna University.

J.B.Pari 7.04.16

TITAN
COMPANY

21st March 2016

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Ramashree Sugumar**, student of **IV Year B.E (Electrical and Electronics Engineering)** from **Thiagarajar college of Engineering** has completed her project training in our organization from 01-12-2015 to 21-03-2016. During this Intern period, her attendance was **100%.**

During this tenure, she has evinced keen interest in learning and her conduct & character were found to be **GOOD.**

We wish all the success in her future endeavors.

Yours faithfully,
For TITAN COMPANY LIMITED,
(Precision Engineering Division)

BENJITH G NATH
MANAGER - HR

PRECISION ENGINEERING DIVISION
Hosur Industrial Complex Hosur 635 126 TN INDIA Tel 91 4344 664831 Fax 91 4344 276523
Tower A Old Airport Road Bangalore 560 017 INDIA Tel 91 80 6660 9000 Fax 91 80 2526 3001 2526 9923
www.titanworld.com
A TATA Enterprise

ZOHO Corporation Private Limited
Estancia IT Park, Plot No.140, 151,
Vallancheri Village, Chengalpet Taluk,
Kancheepuram District - 603 202 Tamilnadu.
Ph: +91- 44 - 6744 7070, Fax: +91- 44 - 2270 7172
www.zohocorp.com

April 6th, 2016

Ref :98/PT-654/16

PROJECT COMPLETION CERTIFICATE

This is to certify that **Mr. Bala Murali V**(Reg. No.:12E14) final year **EEE** Department of **Thiagarajar College Of Engineering**, has successfully completed his internship in **ZOHO Corporation Pvt. Ltd., with title 'Kiosk For Android 6.0 For The Product Mobile Device Manager Plus'**from November 2015(23-Nov-15) to April 2016(1-Apr-16). During the above period, his performance and conduct were found to be good.

ZOHO CORPORATION PRIVATE LIMITED ★ Kancheepuram District 603 202.

Rajesh Ranganathan

(Project Manager)

Mohammed Sohail

(Manager – HR)

Mahendra Submersible Pumps Pvt. Ltd.
An ISO 9001:2008 Certified by BVQ

Since 1960 MAHENDRA PUMPS
Performance. Value. Trust

15.04.2016

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr.P.S.GOWTHAMAN (12E28), Mr.R.HARISH SRINIVAS (12E32) and Mr.INDIVER SAIKHOMCHA (12E34), Final year, B.E. (Electrical and Electronics Engineering) students of Thiagarajar College of Engineering, Madurai-625015 has completed Internship Program in "Three Phase Inverter for Submersible Pump" in our concern for a period from January 2016 to April 2016.

During this period they have done a good work towards the completion of their project.

Mahendra Submersible Pumps Pvt ltd

15/4/16.

S.Ramakrishnan
Manager Design

428 / 2, Kalapatty Road, Coimbatore - 641 014, Tamilnadu, INDIA.
Ph +91 422 6476189 Fax +91 422 2313017
e-mail : mahendrasub@mahendrapumps.in www.mahendrapumps.in

THIAGARAJAR COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to Anna University)

MADURAI – 625 015

CERTIFICATE

Certified that this is a bonafide record of the E84 Project done by Mr.C.PRASANNA VEERARAGHAVAN(Reg.No.**12E71**) Ms.R.PREETHI (Reg.No. **12E73**) and Ms.S.SHRILAA(Reg.No. **12E94**) of Eighth Semester **B.E (Electrical & Electronics Engineering)**, during the year 2015-2016.

21.4.16

Dr. M. GEETHANJALI
Assistant Professor
Department of Electrical & Electronics Engg.
(Guide)

Dr. N. KAMARAJ
Professor & Head
Department of EEE

Station: Madurai

Date: 24.4.16

Submitted for VIVA-VOCE examination held at Thiagarajar College of Engineering, Madurai – 625 015, on 3-5-2016.

INTERNAL EXAMINER EXTERNAL EXAMINER H.D.E.E.

3/5/16

ZOHO : Confirmed Date of Joining
1 messages

kumari.g@zohocorp.com
Reply-To:
To: arunjunai.gowtham@gmail.com
Cc: onboarding@zohocorp.com

Dear Arunjunai Rajan S,

Congratulations !

Welcome to ZOHO family.

Thank you for your confirmation mail.

Please be informed that your confirmed date of joining will be 05-Dec-2016

You will have an induction program o n the day of joining. During the induction you will be briefed about ZOHO, its origination, growth, culture, policies, products, dos' and donts'. This will help you settle down in ZOHO with ease.

The induction session will start at 10.00 a.m. at our office premises.

Points to remember:

1. On the date of joining, make yourself available at our premises by 9.30 a.m. without fail.
2. Read all the documents before you come for induction program.
3. You need to bring all the necessary documents as mentioned in the checklist below.
4. You will have a Photo Session for your company ID card purpose.
5. Please carry a copy of this mail along with you to be allowed inside the office premises.

Our office address :

"ZOHO Corporation Private Limited"
Estancia IT Park PLOT NO. 140, 151, GST ROAD,
VALLANCHERRY VILLAGE, GUDUVANCHERRY,
CHENGALPATTU TALUK,
KANCHIPURAM DISTRICT - 603 202.

ZOHO : Confirmed Date of Joining

1 message

<kumari.g@zohocorp.com> Fri 16 Dec, 2016 at 11:28 AM
To: vsanthozhkumar@gmail.com
Cc: onboarding@zohocorp.com

Dear Santhosh K umar V,

Congratulations !

Welcome to ZOHO family.

Thank you for your confirmation mail.

Please be informed that y our confirmed date of joining will be 21-Dec-2016. Y ou will ha ve an induction program on the da y of joining. During the induction y ou will be brief ed about Z oho, its origination, gr owth, culture, policies, pr oducts, dos' and donts '. This will help y ou settle down in Z oho with ease.

The induction session will star t at 9.30 a.m. at our office pr emises.

Points to remember:

1. On the date of joining, mak e yourself a vailable at our pr emises by 9.00 a.m. without fail.
2. Read all the documents befor e you com e for induction pr ogram.
3. You need to bring all the necessar y documents as mentioned in the checklist be low.
4. You will ha ve a Phot o Session for y our company ID car d purpose.
5. Please carr y a copy of this mail along w ith you to be allowed inside the office pr emises.

Our office addr ess :

Zoho Corpor ation Priv ate Limited

Estancia I T Park,
Plot No. 140 & 151, GST Road,
Vallancherr y Village,
Chengalpattu T aluk,
Kanchipur am District 603 202, INDI A
Phone : 044 - 67447070 / 044 - 71817070 Extn:1770

ZOHO Corporation Private Limited
Estancia IT Park, Plot No.140, 151,
Vallancheri Village, Chengalpet Taluk,
Kancheepuram District - 603 202 Tamilnadu
Ph: +91-44-6744 7070 Fax: +91-44-2270 7172
www.zohocorp.com

PROVISIONAL OFFER LETTER

To

ARUNJUNAI RAJAN.I

Date: 2nd July, 2016

Ref No: TCE/1/PT/5/2017

Congratulations!

Based on your various rounds of interviews with ZOHO at your campus, we are pleased to offer you an internship opportunity as a **"Project Trainee"** as and when your final semester begins. We expect you to work on the project on a full time basis for a period of 5-6 months. During this project tenure you will be paid a stipend of **Rs.15,000/- (Rupees Fifteen Thousand Only).**

If your project work and conduct are found to be completely satisfactory and if Zoho has resource requirements, you may be considered for employment in accordance with Zoho's then current policy. The soft copy of the Internship letter will be sent to your email id and the hard copy will reach your placement team at the earliest.

It is our pleasure that you have chosen us and we look forward to welcome you aboard!

Good Luck!

Authorized Signatory

ZOHO CORPORATION PRIVATE LIMITED
Kancheepuram District 603 202.

Scanned by CamScanner

DAIMLER

Daimler India Commercial Vehicles Pvt. Ltd.

04-Jan-17

Ms. K Padmavathi,
Thiagarajar college of Engineering.

Dear K Padmavathi,

We are pleased to offer you internship from **10-Jan-17** to **30-April-17** at our office on the following terms & conditions:

- You will be paid a consolidated stipend of **INR 12000/- per month**
- You will be required to attend your project for five days in a week at specified working hours.
- Your performance will be monitored periodically during the period of the project.
- By virtue of offering you project, the management will not be obliged in any way to employ you nor would you have any claim for employment with the company.
- You will be governed by the rules & regulations applicable to the project trainees of this company as far as discipline, conduct, time keeping, attendance, etc. are concerned.
- The company will not in any way be responsible for any personal injury/accident during the course of your project.
- Your project may be terminated without giving any notice or assigning any reasons thereof.

During & after the period of your project with the company, you will not engage in any endeavor or activity which conflicts with the interests of the company. A copy of Non-Disclosure Agreement in this connection to be signed by you is enclosed. Please return the declaration duly signed.

Please sign and return the duplicate copy of this letter if the terms and conditions are acceptable to you. At time of joining, please report to Mr. Shin Mv, Human Resources, Oragadam, Sriperumbudur, Tamilnadu, India – 602 105.

For Daimler India Commercial Vehicles Pvt. Ltd.

Mohanraj D
General Manager
Human Resources

Corporate Office:
Unit 201, 2nd Floor, Campus 3B,
RMZ Millennia Business Park, Dr. MGR Road, Perungudi,
Chennai - 600096,
Tamil Nadu, India
Phone: +91 44 4599 6000 | Fax: +91 44 4285 3620
www.daimler-indiacv.com

Registered Office:
SIPCOT Industrial Growth Centre, Oragadam,
Mathur Post, Sriperumbudur Taluk,
Kancheepuram District - 602 105,
Tamil Nadu, India
Phone: +91 44 4969 4000 | Fax: +91 44 4969 4881
CIN: U34200TN2007PTC072876

Honeywell *Strictly Confidential*

Honeywell Technology Solutions Lab Pvt. Ltd.
CIN: U72200KA 1994FTC016379
Survey No. 19/2, Devarabisanahalli Village,
Varthur Hobli, Bengaluru East Taluk
Bengaluru - 560 103, INDIA
Tel: +91-80-2658 8360 / 4119 7222
Fax: +91-80-2658 4750
E-mail : HTSL-Communication@honeywell.com
Website: www.honeywell.com

January 9th, 2017

"The Placement Office"
Thiagarajar College of Engineering
GST Road, Thiruparankundram,
Madurai, Tamil Nadu 625015

Dear Placement Officer,

Subject: Project Work

We are pleased to inform that **Mr. Selvaraj Sudalaiamani** from your institute has been selected for pursuing project work with us.

The project would begin from **23rd January 2017 to 28th July 2017**. The intern is expected to complete the project within the duration. Project completion certificate will be issued only on completion of the project

The letter is only valid for the said duration and does not guarantee employment with **Honeywell Technologies Solution Limited.** The trainee may be deputed to any part of India, as we deem appropriate. During this period the trainee would be paid stipend for an amount of **INR 20,000 per month (Rupees Twenty Thousand only)**, to take care of all incidental expenses. We will pay this amount by cheque/Wire Transfer.

During this time frame the trainee would interact with **Arunkumar Murugesan - Dir IT-Madurai Lead & Conn Tec** from our HTS office.

Yours Sincerely,

For Honeywell Technologies Solution Lab Pvt. Ltd.

Seetha Rani K.P.

Seetha Rani K P
Head Business HR

INTERN JOINING CERTIFICATE

Dear Ragul M,

Congratulations !

Welcome to ZOHO family.

Thank you for your confirmation mail.

Please be informed that your confirmed date of joining will be 18-Jan-2017. You will have an induction program on the day of joining. During the induction you will be briefed about Zoho, its origination, growth, culture, policies, products, dos' and donts'. This will help you settle down in Zoho with ease.
The induction session will start at 9.30 a.m. at our office premises.

Points to remember:

1. On the date of joining, make yourself available at our premises by 9.00 a.m. without fail.
2. Read all the documents before you come for induction program.
3. You need to bring all the necessary documents as mentioned in the checklist below.
4. You will have a Photo Session for your company ID card purpose.
5. Please carry a copy of this mail along with you to be allowed inside the office premises.

Our office address :

Zoho Corporation Private Limited

Estancia IT Park,
Plot No. 140 & 151, GST Road,
Vallancherry Village,
Chengalpattu Taluk,
Kanchipuram District 603 202, INDIA
Phone : 044 - 67447070 / 044 - 71817070 Extn:1770

ZOHO Corporation Private Limited
Estancia IT Park, Plot No.140, 151,
Vallanchery Village, Chengalpet Taluk,
Kancheepuram District - 603 202 Tamilnadu.
Ph: +91- 44 - 6744 7070, Fax: +91- 44 - 2270 7172
www.zohocorp.com

Dated:19-Apr-2017

PROJECT COMPLETION CERTIFICATE

It is to certify **Arunjunal Rajan S (PT-1106/17)** final year Electrical and Electronics Engineering of [illegible] College of Engineering has successfully completed his/her final year project titled [illegible] for API Documentation in **Zoho Corporation Pvt Ltd,** from 05-Dec-2016 to 19-Apr-2017. During the above period, his/her performance and conduct were found to be **Good**.

[illegible] Sundaram P
[illegible] Manager)

Jacline S

(Associate-HR)

e-mail ID: ap.india@zohocorp.com

BHARAT HEAVY ELECTRICALS LIMITED
A Government of India Undertaking
High Pressure Boiler Plant, Tiruchirappalli 620 014 INDIA
Department: PROCESS AND CAPTIVE POWER SYSTEMS (PCPS)
Electrical, Controls and Instrumentation / Building No.79
Telephone : 91–(0431)–2574074
e-Mail : pspandi@bheltry.co.in

P. Samuthirapandi
Deputy General Manager/E, C&I/PCPS

22 04 2017

CERTIFICATE

This is to certify that Shri T. S. KANAGA PRIYANKA (Reg. no. 13E40) of Thiagarajar College of Engineering, Madurai, Tamil Nadu – 625 015 has completed the Project Work on **"AUTOMATION OF LT MOTOR CONTROL CENTRE FOR THE INDUSTRIAL BOILER APPLICATION"** in **Electrical, Controls and Instrumentation, Section of PCPS Department, Bharat Heavy Electricals Limited, Tiruchirappalli 620 014** in partial fulfillment of the requirement for the award of **the Degree of Bachelor of Engineering** in Electrical and Electronics Engineering **during the year 2016-2017.**

She had completed the Project Work successfully within the prescribed period under the guidance of self and internal guide from the BHEL.

P. SAMUTHIRAPANDI
Deputy General Manager
E, C & I / PCPS
BHEL, TRICHY - 620 014.

(Regd. Office: BHEL House, Siri Fort, New Delhi 110 049)

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

BRAKE BY WIRE IN THREE WHEELER

is a bonafide work of

N.S.HARI SANKAR

REG NO : 13E24

8TH SEMESTER B.E ELECTRICAL AND ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING

MADURAI

who has successfully carried out the project work between JANUARY 2017 and APRIL 2017 under my supervision

Mr. V RAGHUNATH KUMAR R

MEMBER R&D

ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

BRAKE BY WIRE IN THREE WHEELER

is a bonafide work of

C.HARIPRIYA

REG NO : 13E27

8TH SEMESTER B.E ELECTRICAL AND ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING

MADURAI

who has successfully carried out the project work between JANUARY 2017 and APRIL 2017 under my supervision

Mr. V.RAGHUNATH KUMAR R

MEMBER R&D

ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

BRAKE BY WIRE IN THREE WHEELER

is a bonafide work of

S.HARIVAISHNAVI

REG NO : 13E28

8TH SEMESTER B.E ELECTRICAL AND ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING

MADURAI

[redacted] successfully carried out the project work between JANUARY 2017 and APRIL 2017 under my supervision

D. Gangi Reddy

Mr. DUMPALA GANGI REDDY

MANAGER

RESEARCH AND DEVELOPMENT

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

BRAKE BY WIRE IN THREE WHEELER

is a bonafide work of

D.RENUGADEVI

REG NO : 13E82

8TH SEMESTER B.E ELECTRICAL AND ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING

MADURAI

[redacted] successfully carried out the project work between JANUARY 2017 and APRIL 2017 under my supervision

20/4/17

Mr. K ANIRUDH MURTHY

MEMBER R&D

ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

BRAKE BY WIRE IN THREE WHEELER

is a bonafide work of

R.SATHEESHVANAN

REG NO : 13E92

8TH SEMESTER B.E ELECTRICAL AND ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING

MADURAI

who has successfully carried out the project work between JANUARY 2017 and APRIL 2017 under my supervision

20/4/17

Mr. K ANIRUDH MURTHY

MEMBER R&D

ADVANCED ENGINEERING GROUP

TVS MOTOR COMPANY LTD, HOSUR

TVS

This is to certify that the project on,

BRAKE BY WIRE IN THREE WHEELER

is a bonafide work of

M.VINOTH KUMAR

REG NO : 13E116

8TH SEMESTER B.E ELECTRICAL AND ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING

MADURAI

[redacted] successfully carried out the project work between JANUARY 2017 and APRIL 2017 under my supervision

D. Gangi Reddy

Mr. DUMPALA GANGI REDDY

MANAGER

RESEARCH AND DEVELOPMENT

Honeywell

Honeywell Technology Solutions Lab Pvt. Ltd.
CIN: U72200KA 1994FTC016379
Thiagarajar College of Engineering
Thiruparakundram, Madurai 625 015, INDIA.
Tel: +91-452-248 8070
Fax: +91-452-248 7884

Apr 2017

varaj S
: 11224398

TO WHOMSOEVER IT MAY CONCERN

Subject - Partial Project Completion Certificate

is to certify that **Selvaraj S** is working with us as a **Project Trainee** at HON Tech Solutions Pvt Ltd, Thiagarajar College of Engineering Campus, Thiruparankundaram, Madurai - 015, India in the project titled "**Asset Health Management System**."

project has been carried out as a partial fulfillment of his Degree Course. The Project shall eemed as completed only at the end of the Internship period.

ny verification on the above details, please email **HRHelp@honeywell.com**

Honeywell Technology Solutions,

Mehrotra

tor HR - HTS India

ZOHO Corporation Private Limited
Estancia IT Park, Plot No.140, 151,
Vallanchery Village, Chengalpet Taluk,
Kancheepuram District - 603 202 Tamilnadu.
Ph: +91- 44 - 6744 7070, Fax: +91- 44 - 2270 7172
www.zohocorp.com

Dated:21-Apr-17

PROJECT COMPLETION CERTIFICATE

This is to certify that **Santhosh Kumar V(PT-1284/17)** final year EEE of Thiagarajar College of Engineering has successfully completed his/her final year project titled AD LDS Object management and reports in **Zoho Corporation Pvt Ltd,** from 21-Dec-2016 to 21-Apr-2017. During the above period, his/her performance and conduct were found to be **Good**.

ZOHO CORPORATION PRIVATE LIMITED ★ Kancheepuram District

[redacted]

[redacted]

ZOHO CORPORATION PRIVATE LIMITED ★ Kancheepuram District 603 202.

Jacline S

(Associate-HR)

TITAN
COMPANY

CERTIFICATE

This is to certify that the project entitled **Activity Tracking Wearable** is a record of work done at Central Technology Service, **TITAN COMPANY LIMITED**, Bangalore by **S.NAVEEN**, a student of Bachelor of Engineering degree in Electrical and Electronics Engineering Department of **Thiagarajar College of Engineering, Madurai** during the internship period of **Dec 12th, 2016 – June 12th, 2017**.

Yours sincerely,

For Titan Company Limited, Bangalore

Sunil Hajeri, Assistant Manager

Central Technology Services Department

Titan Company Limited
(formerly Titan Industries Limited)
Yamalur Main Road Yamalur Post Bengaluru 560 037 India. Tel 91 80 6660 9000 Fax 91 80 6660 8073
Hosur 635 126 TN India Tel 91 4344 664 199 Fax 91 4344 276037. CIN: L74999TZ1984PLC001456
www.titan.co.in

A TATA Enterprise

DAIMLER

Date: 21st April 2017

This is to certify that the Ms. **K. PADMAVATHI** has worked as an Intern with DICV from January 2017 to April; 2017 and successfully **Completed** her Project work entitled **"DEVELOPING AND TESTING OF TELEMATICS TRACKER FOR DICV VEHICLES"**, in partial fulfilment for the requirement **Bachelor Of Engineering Degree in Electrical and Electronics Engineering.**

Y. Barathvajan

(Senior Manager – TP & Electrical Testing)

Y BARATHVAJAN
Senior Manager - Functional Testing
Daimler India Commercial Vehicles Pvt. Ltd.
21 APR 2017

Corporate Office:
[illegible] 2nd Floor, Campus 3B,
[illegible] Business Park,
[illegible] Road, Perungudi,
[illegible] Tamil Nadu, India
Phone: [illegible]
Fax: [illegible]

Registered Office:
SIPCOT Industrial Growth Centre, Oragadam
Mathur Post, Sriperumbudur Taluk
Kancheepuram District, PIN-602105
Tamil Nadu, India
Phone: +91 44 4969 4000
Fax: +91 44 4969 4881

PLATFORM 3

Date : 21-04-2017

Bonafide Certificate

This is to certify that Mr.**BALAMURUGAN M**(PSINDO0130), from **THIAGARAJAR COLLEGE OF ENGINEERING,MADURAI** is under going internship at **PLATFORM 3 TECHNOLOGIES PVT LTD CHENNAI** from 16/12/2016 to 16/06/2017. As part of internship he has completed the project on "**PREDICTIVE ANALYSIS ON HEALTH CARE DATASET BY DECISION TREE ALGORITHM AND ANFIS**" from December 2016 to April 2017.

Sincerely

PLATFORM 3 TECHNOLOGIES PVT. LTD. Chennai - 96

HR Department

TITAN
COMPANY

1 Dec 2016.

The Head of the Department,
Electrical & Electronics Engineering,
Thiyagarajar College of Engineering,
Madurai.

Sub: Permission for Project Training – Reg.

We are pleased to inform you that the application of **Ms. Meena** student of **Electrical & Electronics Engineering** of **Thiyagarajar College of Engineering** has been considered for undertaking project training in our organization on the following terms and conditions:

1. The duration of Project Training will be for a maximum period of 6 months starting from 15 Dec 2016 till completion of assigned projects.
2. Accommodation and transport arrangements have to be taken care by your student.
3. During this training period, he must strictly adhere to the rules and regulations of the company.
4. The student will be paid stipend of **Rs. 10,000/-** per month during his training period.
5. 2 stamp size photos should be produced to the time office, while reporting.
6. During this training period his internal guide would be **Mr. Ravidas Bhat.**
7. Kindly acknowledge the receipt and confirm the same.

Please report at 8.30 am at the following address:-

28 SIPCOT Industrial Complex,
Hosur - 635 126.

Yours faithfully,
For Titan Company Limited,
(Precision Engineering Division).

Anand D
Executive – Human Resources

PRECISION ENGINEERING DIVISION
28 Sipcot Industrial Complex Hosur 635 126 TN INDIA Tel 91 4344 664831 Fax : 91 4344 276523
No. 138/139 DivyaSree Technopolis Yamalur Main Road Yamalur Post Bengaluru 560 037 India. Tel 91 80 6660 9000 Fax 91 80 6660 8073
www.titan.co.in

A TATA Enterprise

Qualcomm snapdragon

QUALCOMM INDIA PRIVATE LIMITED, BANGALORE

This is to certify that project on the title

"SYSTEM INTEGRATION OF USB-PD"

is a bonafide work of

Mr. RAKESH KUMAR

REG.NO. 13E78

8TH SEMESTER B.E. ELECTRICAL & ELECTRONICS ENGINEERING

THIAGARAJAR COLLEGE OF ENGINEERING, MADURAI

who has successfully carried out the project work between JANUARY 2017 AND APRIL 2017 under my supervision.

Vinay Mallapur
Engineer, Staff
Qualcom India Pvt. Ltd. BANGALORE

TITAN
COMPANY

22nd Apr'17

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Moka Sankar D,** student of **Electrical & Electronics Engineering** from **Thiagarajar College of Engineering** is pursuing his project titled **"Apple Sorting Machine"** in our organization since 15-12-2016.

The duration of his project will be for a maximum period of 6 months from his D O J.

Yours faithfully,
For TITAN COMPANY LIMITED,
(Precision Engineering Division)

ANAND D
Executive – HR

PRECISION ENGINEERING DIVISION
Hosur 635 126 TN INDIA Tel 91 4344 664831 Fax 91 4344 276523
Bangalore Tower A Old Airport Road Bangalore 560 017 INDIA Tel 91 80 6660 9000 Fax 91 80 2526 3001 2526 0023

INTERNSHIP REPORT ON GTTI

The next interesting internship training held at G.D.NAIDU technical training institute, Coimbatore had made us gain lot more practical knowledge. The beginning session involved introductory session of GTTE members. The first three days (June 1-4) we had the theory classes held by Mr. Jithin on metallurgy, Mr. Prakash thomas on hand-tools, Mr. Arun kumar on engineering drawing, which were brief and to the point, though we were electrical student we were able to get along with that curriculum.

This was followed by the enjoyable art of learning where our three days of theoretical knowledge were put in a practical manner from June 5-10. Our hands became the friends of files, enemies of fear and lover of work mans pain. Initially there was more struggle to maintain the balance, straightness and smoothness of the job, later we were able to adapt it. The most admirable thing out of all was that Mr.Harindran sir who helped us do filing was wondered, to see u, complete our work in advance and he also mentioned us as the best batch out of al. though we got many blasts all such things turned out as the reason for perfection at our work.

Then we had the very innovative area of learning from June 11- 26, where there was theory classes on basic electronics, though the topics were like a review of what we've learned, Mr.Jeyaprakash sir took us in depth with all topics, he was not suck up only with the given topic he took us lot more beyond it and tickled our nerves and made our minds stay active, alert, creative and energetic. His way of teaching helped us work on projects on our self. This led to the creation of

1. Anti-sleep goggles for drivers
2. Speed-breaker detector
3. Energy recycler for automobiles
4. Fuel dry run preventor

All our projects were very successful and we were able to feel the real happiness out of our creation. This gave us courage to make us come up with more projects in future. And also we had valedictory function on June 27 where we had our chief guest and prize winners.

Out of all we were so sorry that we could not be on time at GTTI due to transport problem and the late arrival of breakfast at PSG hostel which was later made earlier, even then transportation problem made us reach late by 10 or 15 mins, Provided for girls the room given for accommodation was so untidy and girls cleaned it on their self. The other food and water facilities were good at PSG hostel. All requirements were in reach to the place of stay.

And we also admit our mistake of making night travel from Coimbatore to Hosur and make sure that we will not make it again.

This report is on behalf of the entire EEE department students

BY

ARUN GAYATHRI,

CO ORDINATOR,EEE,

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INTERNSHIP REPORT ON TRAINING HELD AT HOSUR

As days go on... immediately after our semester exams, we put our foot to step into Hosur to get on with our internship atTVS. Initially it was a tough time to leave our home during vacation and to get involved in such activity. Yet with a positive attitude and self- determination that was a good start with the health measurement program on Sunday 15 may. When it was told health session we just thought they would check out with our BMI and nothing more than that, but only then it was known by us that it was to measure all our mental, social and physical well being with a help of few very interesting tests like reading of colors, cancelation of numbers and our response to few practical situations.

The second session on may 18 involved the view on the history of TVS, by Mr.karthick sir and the introductory part of an inspiring person –Mrs.Mrithul mam and this session not only involved the history of TVS but it also made us know how disciplined the TVS company is being carried out. End of that session accompanied the completion of few worksheets.

The next two days went on with DISHA program from may 19 to 21, by M.Naveen sir on ways to goal setting. He just really made us think what our birth is meant for. He made us think we are not a common man and we are someone special who got to have a clear path to our smart goals in relationship with our personal values. Inspite of this session being interesting we wished that two full days of time being spent in this was lavish than required.

Then came the most interesting part of the internship and it was the JED-I program from may 22 to 25, where we had Mr.Rohit, Mr.Leo and Mr.Barath who took this session in a very realistic and interactive manner. Our hands were able to work on wires and circuits, our mind was able to create programs with no stress and strain. A play of three days went so good with no much negatives were we made our led's glow, motors run, buzzer sounds with our circuits and programs. The ending part of this program made us really be creative, competitive and enthusiastic with our hand-made speedometers, anemometers using an LCD display. The happiness with the success in outputs was enjoyed by each and every

one of us, which kindled us to go for the extension of this program being more than three days.

Next it was the most awaiting event on may 26, the tvs plant visit. We had a few classes on safety measures to be followed in shop floor and in industry. Afternoon session we were inside the production unit, where al our minds got active and curious to know what is what, we were able to grasp the happenings at production, assembly and testing centre. All these stuffs were like dream come true. We had no heart to leave the plant. And we wished this visit would have been extended instead of restricting it within one day.

The last but not the least, it was the product training centre on may 27 and 28, where we realized and learnt the art of making a vehicle out of the required parts which were briefed to us during the course time. One main thing to say with is that this session first involved the explanation about TVS branch and their products and the main parts out of which the products are being mad, all such things when it was in words we were not able to clearly visualize what is what but then it was registered in our minds when we were able to touch and feel every parts and the most interesting area of work knowledge was the disassembling and assembling of WEGO and apache vehicles.

Out of all the only matter of inconvenience was that accommodation at Hosur where for boys there was not sufficient restrooms and for girls the rest rooms were not clean. There was improper draining of water and wastes which we found it to be unhygienic and uncomfortable. We don't blame on it, we just put a word, so that it would help our juniors and our fore-coming internships.

This report is on behalf of the entire EEE department students.

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Photoluminescence Efficiencies of Nanocrystalline versus Bulk Y_2O_3: Eu Phosphor—Revisited

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Highly efficient yttrium oxide doped with trivalent europium (Y_2O_3:Eu) phosphor was prepared through precursors synthesized by hydrothermal method. Crystalline precursors, namely europium-doped yttrium carbonate ($Y_2(CO_3)_3 \cdot 2H_2O$:Eu) and europium-doped yttrium hydroxy carbonate (Y(OH)CO_3:Eu), were prepared by varying the concentration of yttrium to europium ions and urea in the reaction mixture. The precursor materials on annealing at 700°C gave nanocrystalline Y_2O_3:Eu, which was further processed at high temperatures in the absence and presence of sintering aid to yield phosphor materials with varying crystallite size and morphology. The precursors and phosphor material were characterized using FTIR, TGA, powder XRD, SEM, TEM, and photoluminescence (PL) spectral studies. The emission efficiency was found to depend on the crystallite size, morphology, and particle size of the phosphor materials. It was observed that phosphor material with spherical morphology and particle size of 0.5–1.0 μm with crystallite size of 100 nm has the highest PL efficiency.

I. Introduction

Yttrium oxide activated with europium (Y_2O_3:Eu) is an unsurpassed red emitter extensively used in compact fluorescent lamps,[1,2] cathode ray tubes,[3] currently used in high-resolution and projection television systems and plasma display devices.[4] Recent advances in field emission display (FED) technology also points out that Y_2O_3:Eu is a potential candidate as the red component.[5] Recently, nanocrystalline Y_2O_3:Eu phosphor has been anticipated to be superior to micrometer-sized materials due to lower screen loading, higher screen density, and high resolution in FED applications.[6] However, the reports on the photoluminescence (PL) efficiency of the nanocrystalline phosphor compared with bulk are ambiguous. Taxak *et al.*,[7] Wakefield *et al.*,[6] and Sharma *et al.*[8] have adopted different methodologies for the preparation of nanocrystalline Y_2O_3:Eu and reported that the PL efficiency of the nanophosphor is better than the bulk material. Nelson *et al.*[9] have explored the alkalide reduction method, Schmechel *et al.*[10] have adopted the chemical vapor synthesis (CVS) method, and Hirai *et al.*[11] have exploited the versatility of emulsion systems for the synthesis of nanocrystalline Y_2O_3:Eu material. These groups have reported that the PL emission of phosphor materials decreased with the decrease in the particle size, indicating that nanophosphors have lower efficiency than the bulk phosphor. Devaraju *et al.*[12] have prepared nanorod- and spherical-shaped Y_2O_3:Eu by the solvothermal method and observed that material with spherical morphology has higher PL efficiency than the rod-shaped one. Combustion method has been successfully used for the preparation of Y_2O_3:Eu nanophosphor by Vu *et al.*[13] and Kottaisamy *et al.*[14,15] Recent studies of Wang *et al.*[16] on the preparation of nano-Y_2O_3:Eu by the spray pyrolysis method has shown that the emission efficiency has increased with the increase in the crystallite size of the phosphor. The Y_2O_3:Eu material prepared at 1400°C was found to have the crystallite size of 42.8 nm and the PL efficiency was found to be 51.76% against the theoretical quantum efficiency of 97%.[17] The PL efficiency of nanocrystalline phosphor versus bulk phosphor seems to be ambiguous. In addition, in most of the papers, the diffused reflectance of phosphor materials was not taken into consideration. Hence, it was felt that it would be desirable to study the parameters that affect the PL efficiency of Y_2O_3:Eu phosphor material.

We have been working in the preparation of phosphor materials using combustion method, hydrothermal method, and solid-state metathesis reaction.[14,15] Among these methods, the hydrothermal method has acquired potential importance in material synthesis owing to the formation of highly crystalline material and its industrial scalability. Hence, appropriate protocols were evolved for the preparation of nanocrystalline phosphor that was processed further by annealing at various temperatures in the presence and absence of sintering aid to obtain phosphor material with the desired crystallite size and morphology. The PL efficiency of the processed material was measured in comparison with the commercial standard phosphor material and the data are reported.

II. Experimental Procedure

(1) Materials

All the reagents used in the present study were analytical-grade materials. Yttrium oxide (99.99%, Hi-Media Laboratories Pvt. Ltd., Mumbai, Maharashtra, India), europium (III) oxide (99.9%), lithium fluoride and sodium fluoride (Sigma-Aldrich India (P) Ltd., Bangalore, Karnataka, India), and urea (99.5%, Sisco Research Laboratories Pvt. Ltd., Mumbai, Maharashtra, India) were used for the preparation of materials. Millipore water was used for all the preparative work. Yttrium nitrate and europium nitrate were prepared by dissolving the requisite quantity of the oxides in AR nitric acid; the excess acid was removed and used for the preparative work.

(2) Methods

Hydrothermal reactor (PARR Model 4836, PARR Instrument company, Moline, IL) was used in this work. An autoclave was

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An Investigation of Facile One-Pot Synthesis of Li_2FeSiO_4/C Composite for Li Ion Batteries

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Li_2FeSiO_4 and its carbon composite are prepared by an urea-assisted combustion method. The synthesis has been carried out in different urea concentrations, namely 1 Molar (M), 2 M and 3 M urea in the cost-effective ambient atmospheric condition. The x-ray diffraction analysis confirms the orthorhombic structure of Li_2FeSiO_4 compounds. The urea-assisted combustion reaction enhanced the phase purity of the compound and prevented the oxidation of ferrous ions in Li_2FeSiO_4. The x-ray photo electron spectroscopy analysis further confirmed the reduction of Fe^{3+} concentration in Li_2FeSiO_4 while adding urea. The Li_2FeSiO_4 compound formation in the presence of urea occurred at a temperature $<$ 623 K. The one-pot synthesis of Li_2FeSiO_4/C with the help of starch and urea in ambient atmospheric condition resulted in Li_2FeSiO_4 with an orthorhombic crystal structure. The carbon coating in an amorphous nature is observed and the lattice dimension values of Li_2FeSiO_4/C are 6.248 Å, 5.330 Å, and 5.029 Å. The lattice parameter has remained unchanged with carbon addition. The addition of 5% carbon to Li_2FeSiO_4 improves the electrical conductivity and lithium diffusion coefficient to 7.24×10^{-4} S cm^{-1} and 5.54×10^{-6} cm^2, respectively. The coulombic efficiency and capacity retention after 50 cycles of Li_2FeSiO_4/C composite are around 83% and 95%, respectively.

Key words: Li ion batteries, cathode material, XPS analysis, cycle life study, electrochemical impedance spectroscopy

INTRODUCTION

This decade has witnessed exuberant blooming in the usage of electronic gadgets in day-to-day life. The evolution of new technologies in various fields is attributable to the rapid development of electronic components. One of the technologies that is responsible for the increased portability of gadgets is rechargeable lithium ion battery technology. Since its evolution from 1990, it has been widely perceived as a futuristic power source for electric vehicles and electronic components. The impediment in the widespread utilization of this technology in electric vehicles is its high cost, high sensitivity to environmental conditions and low cycle life.[1] The above-mentioned issues are associated with the material components such as the cathode, electrolyte and anode, respectively. In order to address these issues, research works have been carried out on each component and also on the design of batteries. Amongst the materials, the cathode material plays a significant role in energy density and cycle life of the batteries. The conventional cathode materials like $LiCoO_2$, $LiMn_2O_4$ and $LiNi_{1-x-y}Co_xMn_yO_4$ have

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National University Corporation
Shizuoka University

Invitation Letter

September 25, 2014

Prof. Muniasamy Kottaisamy
Department of Chemistry
Thiagarajar College of Engineering

Dear Professor Muniasamy Kottaisamy,

We are greatly honored to invite you to "2015 International Symposium toward the Future of Advanced Researches in Shizuoka University". This symposium will be held on January 27 and 28, 2015 in Hamamatsu Campus of Shizuoka University to strengthen educational and research collaboration and friendship between Shizuoka University and other organizations.

We would be very appreciated if you could make a presentation about scientific research at the conference. Furthermore we would like to share the opportunity to discuss cooperative research with your university.

We would like you to arrange the travel to Japan within 7days (from departing your country to returning to your country). Research Institute of Electronics, Shizuoka University shall support the travel expenses including air fare, transportation fee in Japan and accommodation fee in Hamamatsu. In addition, the invited guest is exempted from the symposium registration fee.

We very much appreciate your kind cooperation and look forward to seeing you at the symposium.

Sincerely yours,

Professor Hidenori Mimura
Director
Research Institute of Electronics,
Shizuoka University

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TCE/CDIO/2018/1

19th Feb 2018

To

Chairman and Correspondent,
TCE, Madurai

Respected Sir,

Sub: Request for permission to attend CDIO Asian Regional Meeting –reg.,

The CDIO™ INITIATIVE is an innovative educational framework for producing the next generation of engineers. The framework provides students with an education stressing engineering fundamentals set in the context of Conceiving — Designing — Implementing — Operating (CDIO) real-world systems leading to product design and development. The activities within the CDIO Initiative are based on CDIO curriculum and twelve CDIO standards. Around 120 institutions including **MIT, Stanford, KTH, and Chalmers** are members of CDIO consortium.

In order to implement CDIO framework at TCE, Dr.S.Baskar, Professor & Head, EEE Department and Dr.S.J. Thiruvengadam, Professor, ECE Department were deputed to attend **11th CDIO international conference** at Chengdu, China during June 2015. After attending this conference, fifteen member **"TCE-CDIO"** core group was formed with due representation from all the departments. Two CDIO workshops are successfully conducted to sensitize the core group members in CDIO standards, curriculum and programme evaluation. Since Nanyang Polytechnic-Singapore is leader for the Asian region of CDIO consortium, Dr S.J. Thiruvengadam attended the Workshop on **"Advancing, Innovating and Sustaining CDIO"** at Nanyang polytechnic, Singapore during December 2015. Then, Dr. Dennis Sale, Asst. Professor, Nanyang Polytechnic was invited to conduct one-day **CDIO workshop** on 7th December 2016. In the upcoming 2018-19 curriculum revision, existing curriculum will be revised by introducing CDIO concept.

In order to become the member of *CDIO™ INITIATIVE*, all the current CDIO members should support our membership application. To meet all the CDIO regional members and discuss CDIO implementation with them, attending the upcoming CDIO Asian regional meeting at Vietnam will be very much useful.

In this regard, we request your kind permission to depute Dr. S.Baskar, & Dr. S.J. Thiruvengadam to attend the CDIO Asian regional meeting 12-14th , March 2018 at Vietnam. Also, we request you to grant Rs 1,50,000/- (One Lakh Fifty thousand only) towards Registration, travel, accommodation and other expenses.

Thanking you,

Yours faithfully

Principal