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Editorial Team:

- ❖ Dr. Sachin Ahuja
- ❖ Ms. Neha Tuli
- ❖ Mr. Ravi Gupta
- ❖ Ms. Deepika Sharma

MOBILE ADHOC NETWORK SECURITY

Dr. K. R. Ramkumar
Chitkara University

The mobile ad hoc network (MANET) is a self-configuring group of mobile devices that are interconnected through wireless links. The wireless medium is uncovered which is vulnerable to different attacks and open to the elements of snooping. The eaves dropping are copious in wireless networks. The security algorithms that exist for standard wired networks are not applicable to MANET due to many factors which is the reason why wireless networks are not stable, also topology information varies frequently, and resources are limited. In this environment, it is very difficult to issue and revoke certificates to the legitimate nodes. The extemporized nature of MANET allows a hacker inside the network since there is no centralized access point to monitor or control traffic. A cost effective, reliable, standard frame work for security is needed. The security framework of MANETs can use the existing standards like polynomial secret sharing that uses Lagrange's group theory, symmetric and asymmetric keys, security associations and key exchange algorithms.

continued...



CHITKARA UNIVERSITY RECEIVES ITS FIRST PATENT

INTRODUCTION

The establishment of Security Framework for ad hoc networks is a vast task because of the concurrence of several following factors: Weakness resulting from radio causes the ease of eavesdropping and spoofing call, lack of a priori confidence, lack of infrastructure. Prerequisite for teamwork: The basic network functions such as packet forwarding and routing can be strongly affected by malicious nodes because of not having dedicated devices such as routers and servers that implement network services. The Security solutions based on committed components with predefined roles such as key servers, key distribution centers are not well matched with the basic definition of ad hoc networks. The distributed approach of key management is very much required.

Security Issues

The two main types of attack are active and passive. The first type of attack can execute harmful functions such as packet discarding, routing malfunctioning and payload corruption to collapse the overall system and the second type of attack mainly reads the network functions and collect information about the network. Furthermore, malicious nodes can be part of network and can cause attacks by making use of trapped nodes or by disrupting the normal routing operation or it can be an unauthorized node that aims to cause congestion, propagate incorrect routing information, prevent services or shut them down completely. These extortions exist because of intrinsically limited physical security of mobile ad hoc networks. Undeniably, it is easier to interrupt communications and infuse corrupted messages in the wireless communication medium than in an equivalent wired network. The common attack types are routing information alteration, disconcerting the proper accomplishment of a routing protocol by modifying routing information, by fabricating false routing information, and by impersonating other nodes. The main instance of integrity outbreak is spoofing, whereby a malicious node overrides an authorized node, which is possible because of the absence of centralized authentication in the current ad hoc routing protocols. The immediate dominance of spoofing attack is the overall crumple in network topology information, trailed by network loops and partitioning of network. Fabrication starts with the

generation of false routing messages. It is clear that the security for MANET has to be taken into serious account at the beginning stages of design of ad hoc routing protocols. Here is the list of the basic building blocks of secured routing protocol

- a) Distributed Key Management
- b) IP based Key Generation
- c) Security Association (SA)
- d) Polynomial Secret Sharing

The certificate-issue to a legitimate node is not a simple process; a set of rules or policies have to be constituted for a successful Certificate issue to a genuine node and intensive research work is going in that area. The basic properties of polynomial secret sharing are

- i) Secure: It should be secured.
- ii) Minimal: The size of each segment will not go beyond the size of original data
- iii) Extensible: The shares can be dynamically added or deleted without affecting the other pieces.
- iv) Dynamic: Security can be easily enhanced without changing the secret, but by changing the polynomial occasionally.

Summary

Polynomial secret sharing can be used to distribute keys among nodes and a new node has to collect k shares out of n . This entire process is polynomial solvable. All routing messages are encrypted by a symmetric key which is generated from PSK. Future direction is to frame a standard MANET security framework starts from forming security association and ends with successful data transmission. The Security Association (SA) formation requires lot of policies and issues at initial period where the policies for SA yet to be standardized. The other factors like resource utilization, power consumption, key lengths, key strength, and session key based symmetric key generation also should be taken into account while framing a standard security framework.

Dr. K. R. Ramkumar is *Ph.D. in Computer Science and Engineering and is currently working as Associate Professor | Research in CURIN. His areas of interest are Mobile Adhoc Network, Cyber Security and Cryptography.*



PROVISIONAL PATENTS FILED

Ideas have a short shelf life, you must act on them before expiration date.

John C. Maxwell

- ❖ **‘Therapeutic Composition for the Treatment and Prevention of Alzheimers Disease and other Neurodegenerative Disorders’**
Dt. 29/04/2016 No. 201611015013
Inventors:
Dr. Thakur Gurjeet Singh, Mr. Avaneesh Kumar, Ms. Sonia Dhiman, Mr. Paramdeep Singh, Mayank Sippy
- ❖ **‘Handheld Device Based on Image Processing Technique for Detecting Multiple Disease of Apple Leaf’**
Dt. 30/03/2016 No. 201611011115
Inventors:
Dr. Sheifali Gupta, Ms. Swati Singh
- ❖ **‘Novel Pharmaceutical Excipient for Enhancing Solubility of Poorly Water Soluble Drugs and Method Thereof’**
Dt. 23/03/2016 No. 201611010235
Inventors:
Ms. Manju Nagpal, Ms. Loveleen Kaur, Dr. Sandeep Arora
- ❖ **‘Real time communication device for speech impaired person’**
Dt. 29/02/2016 No. 201611006889
Inventors:
Trinkush, Sonanshu, Dr. Sachin Ahuja
- ❖ **‘Energy Efficient Refrigerator’**
Dt. 31/03/2016 No. 201611011474
- Inventors:**
Dr. Sachin Ahuja, Harjot Singh, Jatin Sharma
- ❖ **‘Coarse Grain Starch for Pharmaceutical Use and Method Thereof’**
Dt. 29/01/2016 No. 201611000854
Inventors:
Dr. Inderbir Singh, Dr. Oluwatoyin Odeku Adepeju, Cecilia Alabi Oluwaponmile
- ❖ **‘Novel Herbal Sunscreen Formulation and Method Thereof’**
Dt. 29/01/2016 No. 201611003234
Inventors:
Dr. Sandeep Arora, Ms. Neelam Sharma, Sukbir Singh, Akansha Mahajan, Jaspreet Kaur
- ❖ **‘Multilevel Human Simulator Based Device for Prediction of Type 2 Diabetes’**
Dt. 29/01/2016 No. 201611003236
Inventors:
Dr. Nitin Saluja, Dr. Varsha Singh, Dr. Archana Mantri
- ❖ **‘Coarse grain starch for pharmaceutical use and method thereof’**
Dt. 01/01/2016 No. 201611000854
Inventors:
Dr. Inderbir Singh, Dr. Oluwatoyin Odeku Adepeju, Cecilia Alabi Oluwaponmile

CONSULTANCY PROJECTS

Small opportunities are often the beginning of great enterprises.

Victor Hugo

1. **Synthesis, characterization and pharmacological evaluation of novel hybrid phthalimide and hydrazone derivatives:**
Organization: Mrs. Jyoti Garg, HAU, Hisar
Project Head: Thakur Gurjeet Singh
February - April, 2016
Chitkara College of Pharmacy
2. **Academic Certification for Advanced Course in DNA Fingerprinting and Molecular Diagnostics:**
Organization: Molecular Diagnostics & Research Laboratories Pvt. Limited, (MDRL) SCO 176, First Floor, Sector 39-D, Chandigarh-160036
Project Head: Dr. Preethi Pradhan
Chitkara College of Health Sciences
3. **Development of video attachment for laryngoscope**
Organization: Excellion Innovations and Inventions Pvt. Ltd., Chandigarh
- Project Head:** Dr. S. N. Panda
March-May, 2016
Centre for Advanced Computing Research
4. **Development of Academic Framework for Advanced Training on Pelvic and Hip Fracture Reconstruction**
Organization: Dr. Seth Masih, PGI, Chandigarh
Project Head: Dr. Preethi Pradhan
March-May, 2016
Chitkara College of Health Sciences
5. **Commercial Development of innovative hybrid Radio Frequency Equipment for food industry (RFEF)**
Organization: NuTech Dairy Engineers Private Limited,
Project Head: Dr. Nitin Saluja
April-July, 2016
Microelectronics and Information Systems Research Centre

CONFERENCES/WORKSHOPS/SEMINARS/EXPERT LECTURE

Leaders think and talk about the solutions; Followers think and talk about their problems.

Brian Tracy

❖ **NEN E Week 2016**

15-17 January, 2016

Centre of Excellence in Entrepreneurship Education (CEEE) organised as part of the NEN E Week 2016 the first ever event in North India called the Technology Innovation & Entrepreneurship Workshop from 15th to 17th Jan, 2016. 120 engineering students of Chitkara University HP campus participated in the event which was entirely offered as a choice based credit course. This was a lifetime experience for the students as it opened their path to pursue their passion in the field of entrepreneurship. The students were given few overview of the subject of entrepreneurship, followed by their individual business idea pitches, structured mentoring by established entrepreneurs and final business plan presentation. There were three teams who won the business plan competition on day three. The program was conducted by Prof. M. Madhuri Sharma jointly with lead Evangelist of Chandigarh Angel Network Mr Vineet Khurana.



❖ **Expert Talk by Mr. Himanshu Batra**

17 February, 2016

17th February, 2016 marked the advent of going ahead with the Nation's vision of Digital India. CEEE organised an expert talk by Mr Himanshu Batra. Himanshu was working with Google and on his return to his motherland India he launched Acadview, Ltd-The Digitization platform for all University certificates and transcripts. Born and brought up in a small town in Haryana, Mr Himanshu did his engineering in Comp Sc. from Kurukshetra University followed by a Masters in MIS from Chicago. Right during his masters, he started his web development company where he helped the SMBs in Chicago region go online with their businesses. Next he joined a small consulting firm in Chicago followed by IBM and the Google. Last year he returned back to India to start his own education tech company and has been working with governments and universities in 4 different states in the north and Karnataka in the south. Mr Himanshu headed the Indian network in Google for many years, hosted a lot of political parties in Indian events and also organised and danced with no other than King Khan of Bollywood, SRK in

his tenure in California. The topic of the expert talk was "Trends of Venture Capital Funding; Digital Revolution and Entrepreneurial Ventures in Digital Space". The CSE



students had a really overwhelming session with Mr Batra. Such platforms open up many new and novel thinking amongst the students and help to ignite the true of entrepreneurship

❖ **National Entrepreneurship Network (NEN) Entrepreneurship Week 2016**

20-27 February, 2016

CEEE celebrated for the first time National Entrepreneurship Network (NEN) Entrepreneurship Week 2016 from 20th to



27th Feb, 2016. There were more than 20 activities that the CEEE organised in both the campuses of Chitkara University involving more than 1000 student E-leaders. Chitkara University contested for Overall Championship Award & Innovations Award. Students from across 10 departments took part in all the activities and they really

ignited the true spirit of entrepreneurship on the campus. The grand finale of the Awards night would be held in Vivekananda Institute of Technology, Jaipur. A team of three students would be there to participate in the Gala Finale.

❖ **Symposium on
*Application of Kinect Technology***

29 February, 2016

CURIN-CACR hosted a symposium on the Application of Kinect Technology at 11.00 in Faraday Hall, Chitkara



University, Punjab Mr. Pratham Bathla presented his project completed in Osnaburg University, Germany on Kinect Technology, he also focused on different application areas. Dr. S.N. Panda, Mr. Rajesh Kaushal and Mr. Naveen Sharma also focused on the applications of Kinect in various innovations.

❖ **IEEE International conference on Communication Systems and Network Technologies (CSNT-2016)**

5-7 March, 2016

Chitkara University, Punjab in association with MIR Labs Gwalior organized and successfully hosted IEEE international conference on Communication Systems and



Network Technologies (CSNT-2016), on March 05-07, 2016. Renowned keynote speakers from international universities were invited. Session chairs were also invited from institution of repute from all over the world and the country. It was

attended by more than 130 delegates. Over 155 research papers were presented. The aim of the conference was to bring experts in their fields of electronics and computer engineering from academia and the industry was successfully achieved. Keynote addresses were given by: Prof Jorge Barbosa, Brazile, Mr Vipran Kumar, Senior Scientist CSIO, Chandigarh, Dr. Ashraf Samara, Jordan. Mr. Poojan Mitra, Technical manager (CISCO) was invited as Guest of honour. Mr. Suman Jolly, Managing Director, Recorders & Medicare Systems Pvt. Ltd. (An Indian MNC) a self made technology entrepreneur of the seventies honoured the conference by being the Chief Guest and sharing his vast experience of research and industrial leadership. His presence motivated and inspired the delegates by showcasing the achievements of Recorders and Medicare Systems Pvt. Ltd. and the enormous potential in the domain of healthcare critical medical electronics instruments.

❖ **Workshop on**

Hindi 'ASR using Word Based Modeling'

18 March, 2016

Dr. Amitoj Singh, Assistant Director-Research and Er. Virender Kadyan, Assistant Professor-Research organized one day workshop on Hindi 'ASR using Word Based Modeling' at CU, Himachal campus. The



audiences for this workshop included the students of CSE/ECE department. This workshop threw light on practical feasibility of making ASR for own language. Dr. Amitoj began his talk by giving an introduction to Language Processing and its importance in a researcher life. The focus was on how to select and process a particular language. He then explained present state of availability of ASR system in Indian Language. In another session, Mr. Virender, gave hands on experience on "How to recognize a particular word in Hindi language using HTK toolkit". He addressed the use of various acoustic

modeling technique to process a small vocabulary Hindi ASR system.

❖ **Workshop on**

Digital Image Processing using MATLAB

6-7 April, 2016

Microelectronics and Information Systems research Centre (MISRC), CURIN organized a Hands-on-Workshop on 'Digital Image Processing using MATLAB' and conducted by Dr. Sheifali Gupta and Dr. Deepika Koundal. The students from ECE and CSE branch participated in this workshop actively. This workshop provided an opportunity to the students to get



introduced to the basics of Digital Image Processing using MATLAB. The two days workshop was suitable for beginners to create applications using digital image processing. This workshop with hands-on training with MATLAB was a

gateway and an eye-opener for the young research community. The workshop also highlighted the recent research developments and the directions for the future Research in Digital Image Processing.

❖ **Workshop on**

Awareness of Intellectual Property Rights Funded by DeitY

8-9 April, 2016

CACR-CURIN organized a Two Days National Level Workshop on Awareness of Intellectual Property Rights on 8-9th April 2016 funded by Department of Electronics and Information Technology.



In this workshop more than 100 participants from different colleges, universities in Punjab participated and were benefitted with the knowledge and experience of the resource persons from Academics/ Industry/Independent innovators in the field of Intellectual Property.

WORKSHOPS/CONFERENCE/SEMINARS ATTENDED

Expert in anything was once a beginner.

Helen Hayes

Ms. Vandna Sharma, DST INSPIRE Fellow and full-time PhD student of Dr Pankaj Kumar, attended the one day workshop (sponsored by IUAC, New Delhi) on "Computer Interfaced

Science Experiments", at SGTB Khalsa College, Sri Anandpur Sahib (Punjab), 12th April, 2016.

COLLABORATION

The best way to predict the future is to create it

Jose Ortega y Gasset

❖ **Chitkara College of Pharmacy (CCP) Collaborates with Harvard Medical School for Research internship for B. Pharm students and increases its IPR strength**

13-14 April, 2016

Continuing with its tie up with Harvard Medical School through Dr. M Bhasin, Prof and Scientist Harvard Medical School, US, CCP conducted a research internship test and Skype presentation for B Pharm Students in association with Harvard Medical School. Initiating the Skype conference Dr Sandeep Arora monitored the synopsis presentation by Ms. Gurleen, Ms. Gauri Chawla, Ms Sangeet, Mr Mahendra Khadka, Mr Vishal, Ms Prabhjot, Ms Shiwali with Dr M. Bhasin, with Mr.

Chanpreet Bindra, Asst. Prof. overlooking the Skype conference arrangements. 2 students will be selected in first lot for internship on research on a project in the area of Pharmacogenomics and Drug Development in metastasis and oncology. Adding to its IPR strength, CCP research team supervised by Dr. Sandeep Arora filed another patent in the area of Phytopharmaceuticals on Novel Herbal Sunscreen formulation, taking total filings to twelve. Other members of the team included students of B. Pharm VI Sem Ms. Akanksha Mahajan and Ms. Jaspreet Kaur with Ms. Neelam Sharma, Asst. Professor & Mr. Sukhbir Singh, Asst. Professor as coordinators for the project. The sunscreen formulation offers the advantage of offering a high SPF

(protection) value with a complete novel herbal composition. Another patent was filed on the idea by M Pharm team including Ms Manju Nagpal and Ms Loveleen Kaur and Dr S Arora, on novel pharmaceutical accipient from herbal gums offering



effective formulation release pharmacokinetic characters, taking the total to 13 for CCP, CU, Punjab.

❖ **Collaborative Product launch for CU and Natural Solutions**
9 April, 2015

Dr. Sandeep Arora has been collaborating with Natural Solutions, Mumbai to provide consultancy regarding development, Quality standardization, regulatory filing, branding and documentation to Natural Solutions, Mumbai through an effective MOU between Natural Solution and Chitkara University for various products including Hypercum, Succare,

Hepa detox, and other herbals, juices and Diet supplements. The launch involved technical presentation on major clinical and health indicators as per allopathic, ayurvedic, and other systems of medicines, process of pathophysiology of common and lifestyle diseases, involvement of herbal constituents in maintenance of cellular mechanisms for disease prevention and health maintenance, technical aspects of herbal product processing, quality standardization and regulatory compliance. This was followed by on the spot technical consultancy by specialist and detailing of products.



The Technical launch took place at Hotel NASSIMA ROYALE, Shekh Zayed Road, Dubai. The other members included Dr Anil Sharma, MD, natural Solutions, Mumbai, Evergreen Herbals, local Distributors in Middle East.

RESEARCH PROPOSALS SUBMITTED/SHORTLISTED/GRANTED/APPROVED

Creative thinking inspire ideas, Ideas inspire change"

Barbara Januszkiewicz

SUBMITTED

Design of Handheld Device for Early Detection of Apple Scab and Marsonina Coronaria Disease of Apple Leaf

Submitted to: Department of Biotechnology for funding under BIOCARE scheme

Project Investigators: Dr. Sheifali Gupta, Dr. Laxmi Rawat and Dr. Rupesh Gupta

GRANTED

Cyber Technology Communication for Women Safety : An Comprehensive Survey of Punjab Haryana and Himachal Pradesh

Funded by: Ministry of Science and Technology, Govt. of India

Principal Investigator: Dr. S. N. Panda

BOOK CHAPTER REVIEW

❖ Ms. Anu Singla, Associate Professor, IAER reviewed the manuscript chapters of book on 'Electrical Machines'

by Oxford University Press, Chennai.

EXPERT TALKS DELIVERED

Leaders think and talk about the solutions, Followers think and talk about their problems.

Brian Tracy

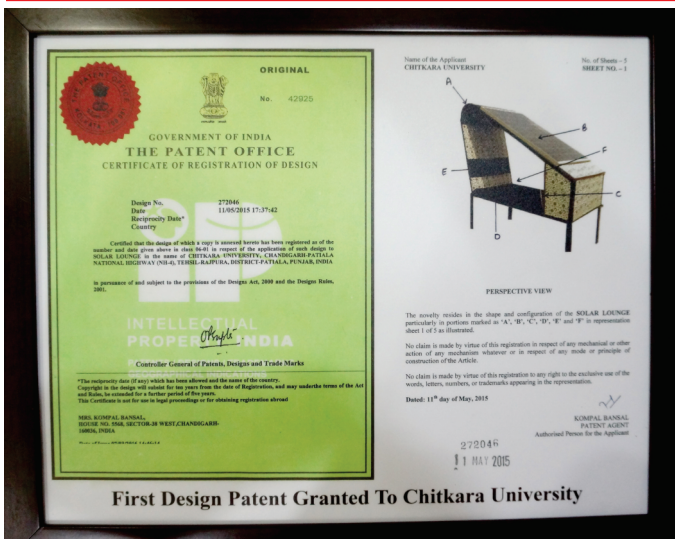
- ❖ Ms. Anu Singla, Associate Professor, IAER gave talk on 'Energy Audit' on February 09, 2016 during Short Term Course on 'Energy Management' through ICT at NITTTT, Chandigarh.
- ❖ Dr. Amit Mittal delivered an Expert talk on "Market Research for Start-ups- Listen & Learn" at JK Business School, Gurgaon organized by Centre for Education, Growth and Research (CEGR), New Delhi (India) on April 18, 2016

- ❖ Dr. Amit Mittal delivered an Expert talk on "Disruption, Destruction and Development", at National Seminar on New Age Business Drivers organized by University Business School, Panjab University, Chandigarh (India) on March 28, 2016
- ❖ Dr. Amit Mittal delivered an Expert talk on "Matching Innovations with Core Competencies- A Smarter Way of Success", at RBMI Group of Institutions, Bareilly (India) on March 12, 2016

CHITKARA UNIVERSITY IS GRANTED ITS FIRST DESIGN PATENT

Chitkara University added another milestone by getting its first Patent of Design of Project 'Solar Lounge'. Mrs. Kompal Bansal, Consultant-Patents handed over the Patent to Dr. Madhu Chitkara, Vice Chancellor, Chitkara University and inventors Ms. Anu Singla, Mr Shrey Dhiman, Ms. Priyanka Saini and Mr. Manish Singh in a small gracious ceremony held at Corporate Office, Chandigarh. Dr Madhu Chitkara congratulated Dr. Archana Mantri and the inventors for their great achievement. The patent is registered for 10 years and can be further extended for another five years.

University is at forefront in promoting innovations and research amongst Chitkara Fraternity. The Office of Patent Facilitation, Licensing and Consultancy (OPFLC), CURIN has filed around 70 patents till now. The first design patent will surely inspire the budding engineers to work on innovative ideas benefitting the society.



MEETINGS UNDER SHARE- Showcase Harp Appreciate Research Exchange

Visit of Dr. Khemraj Emrith, University of West England Bristol, UK 22 February, 2016

Dr. Khemraj Emrith, Programme Leader-CMV/BRL, University of West England Bristol, UK visited Chitkara University on 22nd Feb., 2016 and met Dr. Archana Mantri, Pro Vice Chancellor and CURIN members. He discussed opportunity of vision algorithms in



agriculture, defense and medical industry. He discussed the machine vision implementation of weed detection algorithm applied in real time implementation for E-Deweeder. He also discussed the apple disease detection through leaf with Dr. Sheifali and Dr. Raman Singh. He also shared knowledge on machine learning in vision algorithms.

Visit of Mr. Gagan Malik, CEO, NuTech Dairy Engineering

17 March, 2016

Mr. Gagan Malik, CEO of NuTech Dairy Engineers Pvt. Ltd. visited Chitkara University, Punjab on 17th March, 2016 to offer consultancy in the food processing project. The meeting is chaired by Dr. Archana Mantri and Dr. Nitin Saluja offered



consultancy in the domain. Dr. Parikshit Bansal discussed licensing issues while Dr. Kompal Bansal discussed patentability issue for the project.

Visit of Dr. Jadab Sharma, Panjab University, Chandigarh

19 March, 2016

Dr. Jadab Sharma visited Chitkara University, Punjab on 19th March, 2016. He presented his earlier and ongoing research in the field of nanotechnology to the CURIN members and senior faculty from other departments of the university. The challenges and opportunities in the domain were discussed. He had one on one discussion with the CURIN members in their respective domains and ongoing



and future research plans. While citing various national and international research funding agencies he emphasised on the collaborative research exploiting the varying skill sets of the individual researchers.

Expert Talk by Dr. Mini Thomas, Chairperson, IEEE PAS-IAS Delhi

8 April, 2016

Dr. Mini Thomas, Chairperson, IEEE PES-IAS Delhi Section, Director of Center of Excellence and Innovation for Jamia Millia Islamia (JMI) and Dr. Rachna Garg,



Student Activity Chair, Delhi Section visited Chitkara University, Punjab on 8th April, 2016. The discussion was held with the CURIN members and various society incharges regarding how we can further indulge in research and undertake various projects under IEEE and

WIE. Dr. Archana Mantri, Pro Vice Chancellor, CURIN also suggested and asked them to initiate awards for Ph.D Scholars from IEEE and WIE related to research proposals and dissertations. Establishment of various IEEE chapters was also discussed in the meeting.

Visit of Mr. Arun Monga, CEO, Monga and Strayfield Industries, UK

8 April, 2016

Mr. Arun Monga visited Chitkara University, Punjab on 8th April, 2016 to discuss opportunity of Radio frequency heating in food processing. He delivered seminar on How Radio frequency



heating works and practical challenges in implementation of machines in real practice to members of Chitkara University Research and Innovation Networks (CURIN).

Visit of Dr. Binod Luitel, Associate Professor, Tribhuvan University

14 April, 2016

Dr. Binod Luitel from Tribhuvan University visited Chitkara University, Punjab Campus on April 14, 2016. A brief interaction of the guest was organised with Dr. Archana Mantri, Pro Vice Chancellor, CURIN and the faculty from English Department where he shared the findings of his research carried out among school students on developing the reading skills and comprehension in L2 learners. He established the connection

between Vocabulary acquisition and Bloom's taxonomy, but reiterated the inverted application of the model in his study. His findings also established that the translation tasks brought



about better results compared to the other tasks in the learners' productive vocabulary knowledge.

Visit of Team Members from Western Sidney University, Australia

14 April, 2016

A team of two faculty members and six students from Western Sidney University, Australia visited Chitkara University Research and Innovation Network (CURIN) on 14th April, 2016 and interacted with the students of 'Students



Participation In Research and Innovative Technique-SPIRIT' of CURIN, Chitkara University and discussed the Technology used in both the Universities in different Innovative Projects.

PUBLICATIONS

A simple idea can inspire, motivate and produce change."

Leizee Gurl

- ❖ V. Kadyan, A. Singh and P. Wadhwa, 'Hindi Dialect Spoken Language Recognition (HD-SLR) System using Sphinx3' in ICICCD at UPES, 2-3 April, 2016.
- ❖ Kaur, A. Singh and V. Kadyan, 'Correlative consideration concerning feature extraction techniques for Speech Recognition- a Review', in ICCPCT at Noorul Islam Centre for Higher Education, Kumaracoil, 18-19th March, 2016.
- ❖ Garg D., Sohal H., Ahuja S., 'SSTL IO Standard Based Power Efficient Data Processing Device Design on FPGA', IEEE International Conference on Circuits, Power and Computing Technologies, ICCPCT-2016, March 18-19, 2016, Noorul Islam Centre for Higher Education, Kumaracoil, Tamilnadu, India.
- ❖ Gupta S., Singla C., 'Grade Identification of Astrocytoma Using Image Processing- A Literature Review', Accepted

- in IEEE Conference on Computing for Sustainable Global Development, 16- 18 March, 2016, BVICAM, New Delhi (INDIA)
- ❖ Kaur H., Sohal H. and Singh J., 'Design and performance analysis of UART using Altera Quartus-II and Xilinx ISE 14.2', 6th Edition of International Conference on Communication Systems and Network Technologies, CSNT-2016, March 05-07, Chitkara University, Chandigarh, India.
 - ❖ Sharma A., Sohal H., 'Area-Power Efficient 4- Bit Signed Adder Design for Arithmetic Applications', 6th Edition of International Conference on Communication Systems and Network Technologies, CSNT-2016, March 05-07, Chitkara University, Chandigarh, India.
 - ❖ Chopra, S. Sharma and V. Kadyan, 'Need of Green computing to improve environmental condition in current era', in ICEEOT at DMI College of Engineering Chennai, 3rd-5th March 2016.
 - ❖ Ahuja, S., 'Analysing Students Performance and Knowledge Creation at Master's Level in Flip Mode Classroom', Journal of Engineering Education Transformations, 2016.
 - ❖ Marwaha A., Ahuja S., 'A Review On Educational Data Mining: For Analyzing Students' Performance', 4th International Conference On Advancements in Engineering & Technology, Sangrur, Punjab. 18-19, March 2016.
 - ❖ Garg D., Sohal H., Ahuja S., 'SSTL IO Standard Based Power Efficient Data Processing Device Design On FPGA', IEEE International Conference On Circuit, Power and Computing Technologies – 2016, Tamil Nadu, 18-19, March 2016.
 - ❖ Jaggi C., Sharma V., Shrama A., Raina K.K., Kumar P., 'Vertical alignment of liquid crystals induced using inorganic nano particles', 10th Chandigarh Science Congress (CHASCON-2016), Panjab University, Chandigarh (India), Feb 29 - March 2, 2016.
 - ❖ Sharma V., Jaggi C., Shrama A., Raina K.K., Kumar P., 'Effect of carbon nano tubes and dichroic dye on dynamic responses of polymer dispersed liquid crystal', 10th Chandigarh Science Congress (CHASCON-2016), Panjab University, Chandigarh, Punjab (India), Feb 29 – March 2, 2016.
 - ❖ Sharma V., Jaggi C., Shrama A., Raina K.K., Kumar P., 'Well developed alignment of liquid crystal molecules by using carbon nano tubes in polymer dispersed liquid crystal', 2nd Conference on Microscopy in Materials Science (AMST-2016), Thapar University, Patiala, Punjab (India), Feb 25-27, 2016.
 - ❖ Jaggi C., Sharma V., Shrama A., Raina K.K., Kumar P., 'Zinc oxide nano particles induced vertical alignment of liquid crystals', 2nd Conference on Microscopy in Materials Science (AMST-2016), Thapar University, Patiala, Punjab (India), Feb 25-27, 2016.
 - ❖ Tuli N., Mantri A., (Jan, 2016), 'Interactive Faculty Display: Giving AR Experience', Journal of Engineering Education Transformations, Vol. 29, No. 3, January 2016, pp. 61-66.
 - ❖ Kaushal. R, Panda. S.N., 'Effective Teaching Methods and Proposed Web Libraries for Designing Animated Course 2016' published in IJACSA, Thomson Reuter Indexed Journal ISSN: 2158 - 107X Vol 2 No. 7, 2016.
 - ❖ Kumar P., Jaggi C., Sharma V., Raina K.K., 'Advancements of vertically aligned liquid crystal displays', Micron, 81 (2016) 34. (Impact Factor - 2.0)
 - ❖ Gupta S., Khosla N., 'Neural Network Based Rotation, Scale and Font Invariant English character Recognition System', International Journal of Imaging and Robotics 2016, Volume 16, Issue No. 1 (Scopus Indexed). Link: <http://www.ceser.in/ceserp/index.php/iji/article/view/4024>.
 - ❖ Singla A., Singh K., and Kumar Y. Vinod, "Environmental Effects on Performance of Solar Photovoltaic Module", IEEE Biennial International Conference on Power & Energy Systems: Towards Sustainable Energy-2016, Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Bengaluru, Jan. 21-23, 2016.
 - ❖ Mittal, A., & Jhamb, D., 'Determinants of Shopping Mall Attractiveness: The Indian Context', Procedia Economics and Finance, 37, 386-390. Published by ELSEVIER, 2016.
 - ❖ Sharma, M. & Dhiman, R., 'Determinants Affecting Indian Textile Exports: A Review', Biz and Bytes. A Journal of Management & Technology. 6(2): 193-199. (E-ISSN: 0976-0458, Print ISSN: 2320-897X), 2016.
 - ❖ Dhiman, R. & Sharma, M., 'Textile Exports in South Asia and its determinants: A Literature Review', Frontiers of New Era for Indian Economy. (pp 244-251). Bharti Publications: New Delhi. ISBN: 9789385000546, 2016.
 - ❖ Sahil Gupta "Determinants of Online Shopping Attractiveness to the millennial in India Seminar : The New Age Business Drivers" National Seminar, UBS, Punjab on 28-March-2016.
 - ❖ Sahil Gupta "A Novel & Parametrized Approach Towards Efficient MOOC Learning" at CSI-2015 , New Delhi in January 2016.

ACHIEVEMENTS

Optimism is the faith that leads to achievement. Nothing can be done without hope and confidence.

Helen Keller

- ❖ Dr. Raman Singh, Assistant Professor, CURIN received Publication Award for his research paper "An Intrusion Detection System using Network traffic Profiling and Online Sequential Extreme Learning Machine", Experts Systems with Applications (Elsevier Journal, Indexed in SCIE and SCOPUS). ISSN: 0957-4174, Impact Factor: 2.240, Source Normalized Impact per Paper (SNIP): 2.534. Volume 42, Issue 22, pages 8609–8624.
DOI: <http://dx.doi.org/10.1016/eswa.2015.07.015>.
- ❖ Dr. Jaiteg Singh, Dr. S.N. Panda, Dr. Sachin Ahuja, Dr.

K.R. Ramkumar, Dr. Nitin Saluja, Dr. Amitoj Singh chaired session in IEEE International Conference on Communication Systems and Network Technologies (CSNT-2016) on 5-7 Mar., 2016 held at Chitkara University, Punjab

- ❖ Dr. S. N. Panda received Certificate of Appreciation from Informing Science Institute (ISI) Vilnius, Lithuania for worked as productive member of International review board 2016.
- ❖ One of the research scholar of Dr.S.N.Panda, received his Ph.D. Degree from Punjab Technical University, Jalandhar in March 2016 on topic "Spectra of Spiffy Cyber World and Sustainability Analysis of its Security Issues & Challenges in Global Scenario".
- ❖ Vandna Sharma, Chinky Jaggi, Kuldeep Kumar Raina, Pankaj Kumar won Dewan Jawahar Lal Nayar Memorial Prize for the year 2015 by the Indian Liquid Crystal Society for the best paper on "Comparative study of polymer dispersed liquid crystal materials performance using carbon nanotubes and dichroic dye" at NCLC-22, DIT University, Dehradun, Uttarakhand (India), Dec 21-23, 2015.
- ❖ Vandna Sharma, Chinky Jaggi, Amit Sharma, Kuldeep Kumar Raina and Pankaj Kumar won Third Best Poster Paper Award for "Effect of carbon nano tubes and dichroic dye on dynamic responses of polymer dispersed liquid

crystal", at Chandigarh Science Congress (10th CHASCON), Panjab University, Chandigarh, Punjab (India), Feb 29 - March 2, 2016.

- ❖ Chinky Jaggi, Vandna Sharma, Amit Sharma, Kuldeep Kumar Raina, Pankaj Kumar won Best Poster paper award for "Vertical alignment of liquid crystals induced using inorganic nano particles", at Chandigarh Science Congress (10th CHASCON), Panjab University, Chandigarh, Punjab (India), on Feb 29 - March 2, 2016.
- ❖ Vandna Sharma, Chinky Jaggi, Amit Sharma, Kuldeep Kumar Raina, Pankaj Kumar stood Second in Best Poster Paper Award by the Academy of Microscope Science & Technology (AMST) for "Well developed alignment of liquid crystal molecules by using carbon nano tubes in polymer dispersed liquid crystal", at 2nd Conference on Microscopy in Materials Science, Thapar University, Patiala, Punjab (India) on Feb 25-27, 2016.
- ❖ DST released 1st installment of INSPIRE Fellowship of the amount of 3.5 Lakhs for Vandna Sharma (full-time PhD student of Dr. Pankaj Kumar).
- ❖ Dr. Amit Mittal, DEAN (DRC), was selected to National Executive Council of Centre for Education, Growth and Research (CEGR), New Delhi in April, 2016 for a period of two years.

