



COMPUTER SOCIETY OF INDIA TIRUCHIRAPPALLI CHAPTER

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JULY - SEP, 2019

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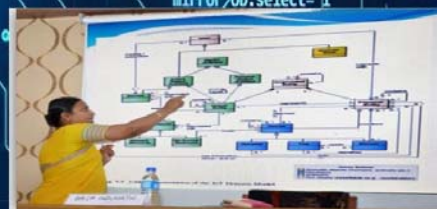
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**News Letter
Committee**

**Er. MJ Divya
Er. S Lakshmanan**



CHAIRMAN'S DESK



Dear Members,

Warm & Best Greetings to all.

Very happy to meet all of you through our CSI Tiruchirappalli E Newsletter, CASCADE, again.

The editorial team has brought out the 2nd issue nicely. Kudos to the team.

During this period, the chapter has conducted Seven Lecture programmes with IEI, TLC and 15 programmes through Mount Zion College of Engineering, MAMCE, JMC, KRCE and MIET covering various aspects of our field. The topics include application of biometrics, 4G & 5G wireless technologies, search engines, RFID and health monitoring, Modelling, Python, Arduino platform, block chain technology, cloud computing, mobile applications, etc. We have also conducted many events for the students' community viz. Complaz 2019, Smart Era 2k19, Student Colloquium, ITCONNECT 2019, etc.

On behalf of CSI Trichy chapter, I congratulate the and appreciate the role played by our members in making the programme successful ones. I convey our sincere thanks and appreciations to the experts for handling the sessions and enlightening the participants.

We welcome suggestions from our members about the themes for technical events as well as on our Newsletter. The feedback may be sent to csitiruchy@gmail.com

We solicit your support to make our Chapter to be the best to disseminate knowledge in the Computer Science and Information Technology to this part of our country.

With Best Wishes,

Er. R. Selvaraj
Chairman CSI Tiruchirappalli.



EDITORIAL

During the second Quarter-Jul-Sep-2019,

CSI Tiruchirappalli Chapter in association with IEI-TLC has conducted free lectures namely Revealing the Secrets of Search Engine, RFID Based Wireless Sensors for Structural Health Monitoring Rapid Product development through 3D Printing, Modelling of IOT Systems using UML Diagram

Search Engine usage has become ubiquitous, now-a-days. This session gave a good orientation on how to exploit search Engine Technologies besides Searching Problems to find results in foreign languages.

Recent advancements in sensor technology have paved way for usage of RFID Based Wireless Sensors for Structural Health Monitoring. The lecture on Trends of 3D Printing and applications, Classification and details of Rapid Prototyping processes & extension for tooling and manufacturing was well received by the participants.

As we are aware IOT is infusing dynamism everywhere. The session on modelling of IoT systems using UML diagrams in particular enriched how UML diagrams aims to guide the IoT design to a more standardised methodology of development and deployment.

With Regards

Editorial Team

CSI Tiruchirappalli Chapter.



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VENUE:

- ❖ IEI-TLC-Institute of Engineers (Opp to bldg.79, BHEL Tiruchirappalli)
- ❖ MAMCE-MAM College of Engineering, Siruganur, Tiruchirappalli.
- ❖ MZCET-Mount Zion College of Engineering & Technology
- ❖ JMC-Jamal Mohamed College

LECTURES

Biomimetic Aircraft: Engineering in Nature's style



Dr. Arunvinthan delivered this lecture.

On 02nd July 2019, the centre organised a free lecture programme on “Biomimetic Aircraft: Engineering in Nature’s style”.

The word “Biomimetic” is derived from two Greek words namely “bios” which means life and “mimesis” means mimicry. It was first coined by Otto H Schmitt during the year 1957. Biomimetic is defined as the study of structures and functions of biological systems in the design of engineering systems.



CSI Trichy Nomination Committee MC Member Er S. Lakshmanan is handing over the Gift Cover to the Speaker Dr. Arunvinthan

An Insight into Ear Biometric Recognition Techniques



On 09th July 2019, the centre organised a free lecture programme on “An Insight into Ear Biometric Recognition Techniques”.

An Insight into Ear Biometric Recognition Techniques Recognition of human has become indispensable in every walk of life ranging from human authentication in airports, identification of criminals by police and up to user recognition for access of library resources.

Dr. R Sowmyalakshmi, Assistant Professor Dept. Of ECE, University college of Engineering (BIT campus) Tiruchirappalli is delivered this lecture.



Er D. Senthil Kumar is handing over the Gift Cover to the Speaker, in the presence of Dr.Kumaresan NIIT & Er.Anand MC Member

MIMO precoding in 4G and 5G Wireless Technologies



On 23rd July 2019, the centre organised a free lecture programme on “MIMO precoding in 4G and 5G Wireless Technologies”.

The term wireless communication was introduced in the 19th century and wireless communication technology has developed over the subsequent years.

Dr. Priya SBM Former Assistant Professor, J.J.College of Engineering & Technology, Tiruchirappalli is delivered this lecture.



Er S. Lakshmanan, CSI Trichy Nomination Committee MC Member introducing the speaker.

Revealing the Secrets of Search Engine



On 13th August 2019, the centre organised a free lecture programme on “Revealing the Secrets of Search Engine”.

A search engine (Wikipedia) is an information retrieval software program that discovers, crawls, transforms and stores information for retrieval and presentation.

Dr. K. Latha M.E., Ph.D. Assistant Professor Department of CSI, Anna University Trichy delivered this Lecture.



Er S. Lakshmanan, CSI Trichy Nomination Committee MC Member
Handing over Gift Cover to the speaker. Near by Er. Anand MC Member

RFID Based Wireless Sensors for Structural Health Monitoring



On 27th August 2019, the centre organised a free lecture programme on “RFID Based Wireless Sensors for Structural Health Monitoring”.

Recent advancements in sensor technology, rapidly increases the growth of condition monitoring of engineering structures.

Dr. C. Geetha, Assistant Professor, Department of Instrumentation & Controls Engineering National Institute of Technology Trichy delivered this Lecture.



Er R. Selvaraj ---Chairman handing over the Gift Cover to the Speaker Dr C. Geetha



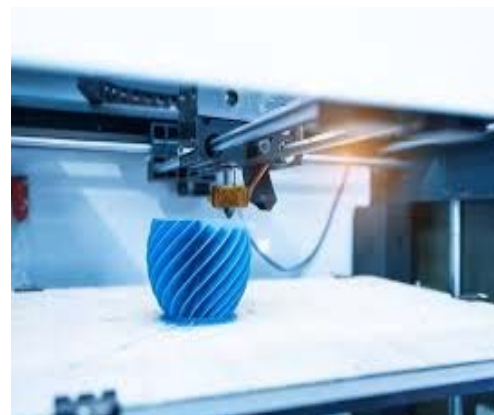
Rapid Product Development through 3D Printing



On 03rd September 2019, the centre organised a free lecture programme on “Rapid Product Development through 3D Printing”.

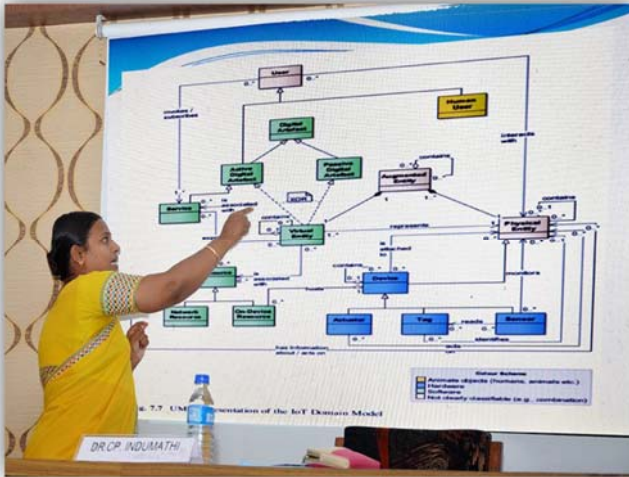
This lecture starts with the role of Rapid Prototyping in product development, basics of Rapid Prototyping processes.

Dr. P. Senthil Associate Professor Department of Production Engineering
NIT Tiruchirappalli-15 delivered this lecture.



Er S. Lakshmanan ----Nomination Committee MC Member is presenting the Gift Cover to the speaker Dr P. Senthil

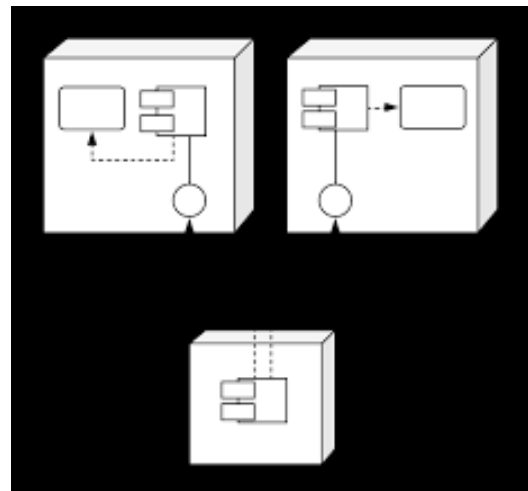
Modelling of IOT Systems Using UML diagram



On 10th September 2019, the centre organised a free lecture programme on “Modelling of IOT Systems Using UML diagram”.

Today, the Internet of Things has become a popular term for describing scenarios in which Internet connectivity and computing capability extend to a variety of objects, devices, sensors.

Dr. C. P Indumathi, Assistant Professor, CSE Department, Anna university Tiruchirappalli delivered this lecture.



Er N. Rajasekaran, Vice Chairman, CSI Tiruchirappalli Chapter handing over the Gift Cover to the Speaker Dr C. P. Indumathi.



Code War on Python

Mount Zion College of Engineering & Technology (MZCET), Pudukkottai, joined hands with CSI to conduct a one day programme on “CODE WAR ON PYTHON” in which 55 students participated. The event was conducted on 02nd August 2019 with hands on training at the computer lab of the college.



Comb laze 2019

The 19th National Level Technical Symposium “Comb laze 2019” was organized by the Department of Computer Science and Engineering & Information Technology of MAMCE in association with CSI Tiruchirappalli Chapter on 19.8.19. Student participants from 30 colleges participated in the event. The chief guest Mr. Mohamed Nawshath Ali, Project Manager, AI Watania, Saudi Arabia on inaugurating the symposium highlighted the emerging IT fields and the role of Artificial Intelligence. He also invited the Students to strengthen their Knowledge in their respective domain to overcome business related issues. Technical and Non-Technical events were conducted to bring out the talents and skills of the participants. Bishop Heber College, Trichy emerged as the Overall Champions and K. Ramakrishna College of Engineering emerged as runner up.





Online Education Seminar

On 23rd August 2019, an “Online education Seminar” was conducted for the 3rd year CSE & IT student by Mrs. Revathi AP, ECE Department of MAMCE at the college premises. The programme was organized by the department of CSE & IT in association with the chapter.



Workshop on Arduino Platform

On 27th Aug 2019, the Student Chapter of Jamal Mohamed College, Tiruchirappalli in association with the dept. of Computer Science and the chapter organized a workshop on “Arduino-Open Source Electronics Platform Tool”. Mr. V. Kanagaraj, Control Systems Instructor, ALmusanna College of Technology, Oman delivered the lecture in the workshop.



Hands on training was given to the participants by Mr. V Kanagaraj on Arduino kit and its interfacing with software tool.





SmartEra2K19 – Technical Exhibition

On 28th August 2019, the KRCE Student Chapter in association with the chapter organised Smart Era 2k19, a technical exhibition at the college premises. In the team event, students showcased their skills and presented their works. The best exhibits were awarded. 24 teams participated in the event.



Presentation Day

On 29th August 2019, presentation day was conducted at KRCE for the 2nd year students of computer science engineering. The event was organised by the KRCE students' chapter in association with Department of CSE with our chapter. 119 students attended the event and got benefitted from the presentations and expert guidance.



Seminar on Block chain Technologies

On 30th August 2019, a seminar on Block Chain Technology was conducted by MIET Engineering College. The resource person Mr. Bala Dhandayuthabani of Syntel Inc. elucidated on the theme for the benefit of the students. The event was organised by the MIET students' chapter in association with Department of CSE with our chapter.





Seminar on Security Issues in Cloud Computing



On 31st August 2019, a seminar on Security Issues in Cloud Computing was conducted by MIET Engineering College. The resource person Mr. Vijai Veeramani, Oracle Corporation, Bangalore talked on the theme for the benefit of the students. The event was organised by the MIET students' chapter in association with Department of CSE with our chapter.

Code Optimization

Mount Zion College of Engineering & Technology (MZCET), Pudukkottai, joined hands with CSI to conduct a one day programme on “CODE OPTIMIZATION” with hands on training. 35 students participated in the event which was conducted on 5th Sep 2019.



Students Colloquium



A students Colloquium was conducted the premises of the Mount Zion College of Engineering & Technology (MZCET), Pudukkottai, on 13th September 2019. 10 students shared their experiences with the participants in the event organised by MZCET in association with our chapter.



SEMINAR ON DIGITALIZATION AN ENDLESS ERA

160 students participated in the one day seminar on “Digitalisation an Endless Era” at the premises of the Mount Zion College of Engineering & Technology (MZCET), Pudukkottai, on 16th September 2019. Expert lectures were part of the event organised by MZCET in association with our chapter.



ITCONNECT 2K19

- ❖ An Inter-Collegiate Technical Symposium ITCONNECT 2K19 on 19th September 2019 at the N. B. Abdul Gafoor A/C Auditorium of JMC by the Dept. of IT, JMC in association with the chapter.
- ❖ Dr. S. Ismail Mohideen, Principal, Jamal Mohamed College presided over the function. Dr. A. K. Khaja Nazeemudeen, Secretary and Correspondent, Jamal Mohamed College, inaugurated ITCONNECT 2K19. Hajee M. J. Jamal Mohamed Sahib, Treasurer and Dr. K. Abdus Samad, Assistant Secretary offered felicitations. Prof. J. Fathima Fouzia, Programme Co-coordinator, ITCONNECT 2K19 welcomed the gathering. Dr. S. Abdul Saleem, Member In-Charge of the Department, proposed the vote of thanks.





- ❖ Dr. S. Ismail Mohideen, in his presidential address, highlighted the dedicated services rendered by the founding fathers of Jamal Mohamed College. He stressed that students should know the purpose of education and the responsibility of developing a happy and civilized society. Dr. A. K. Khaja Nazeemudeen Sahib, in his inaugural address, told that the symposium is a platform for the students to exchange their innovative ideas, knowledge and skills. He also emphasized that learning is a continuous process. Students should develop the knowledge in the field of computer science and IT technologies.
- ❖ The events like Bug Monsters, Paperenza, Battle of Brains, Web Crack and Techno Freaks were conducted. Dr. A. R. Mohamed Shanavas, Associate Professor of Computer Science, Dr. S. Abdul Saleem, Associate Professor of Computer Science, Dr. S. Mohamed Iliyas, Associate Professor of Computer Science, Mr. S. Peer Basha, Assistant Professor of IT, Mr. R. Inbaraj, Assistant Professor of IT acted as judges for various events.
- ❖ Dr. T. Abdul Razak, Co-coordinator (IT) and IQAC Co-coordinator of the college as well as our Imm. Past Chairman welcomed the gathering. Ms. J. Sanofer Fathima (BCA) presented the ITCONNECT 2K19 report. Dr. S. Ismail Mohideen, Principal, Jamal Mohamed College presided over the function. Dr. A. Mohamed Ibraheem, Vice-Principal, Jamal Mohamed College offered felicitation. Ms. N. Fathima Farzana, Tech Lead, AAA Auto Insurance, California, USA who is an illustrious alumna delivered the valedictory address and distributed the prizes. Mr. M. Kamal, Member In-Charge of the Department, proposed a vote of thanks.
- ❖ Ms. N. Fathima Farzana, Chief Guest, in her valedictory address, stressed that students should spend more time to enrich their skills and knowledge. They should do the good real application oriented projects which are useful to the society. She also advised that students should think of the development in the field of IoT, Cloud Computing and Big-data. She emphasized that students should also develop their communication skills, inter-personnel skills and knowledge in technologies to face the competitive world.





- ❖ As many as 150 students from various Arts, Science & Engineering Colleges and Universities participated in the symposium. The prizes and merit certificates were distributed to the first and second place winners. The overall championship award was bagged by students of Holy Cross College.
- ❖ Management Committee Members, Vice-Principal, Additional Vice-Principal, Directors-Hostel Administration, Director – Women Hostel and Faculty Members of Jamal Mohamed College graced the occasion.
- ❖ The Head of the Department & Convener, Co-coordinator, Member In-charges of the Department, Faculty Members, Programme Co-coordinators of ITCONNECT 2K19 and various student committee members have made all the arrangements for the enjoyment and enlightenment of all the participants of the mega function.

WORKSHOP ON MOBILE APPLICATION DEVELOPMENT USING PHONEGAP TOOL

On 20th September 2019, a one-day workshop on “MOBILE APPLICATION DEVELOPMENT USING PHONEGAP TOOL” was conducted by the Mount Zion College of Engineering & Technology (MZCET), Pudukkottai in association with our chapter. 73 participants attend the workshop.



Seminar on Data Science

On 20th September 2019, a seminar on Data Science was conducted by MIET Engineering College. The resource person Ms. Rani, Trainer, Live wire, Trichy talked on the theme for the benefit of the students. The event was organized by the MIET students' chapter in association with Department of CSE and our chapter.



Workshop on Mobile APP Development

On 24th September 2019, a seminar on Data Science was conducted by MIET Engineering College. The resource person Mr. S. P. Srinivasan, Technical Head, Gateway Finishing School, Trichy, talked on the theme for the benefit of the students. The event was organised by the MIET students' chapter in association with Department of CSE and our chapter. Participation certificates were issued to all participants.



TECHNICAL ARTICLES

Biomimetic Aircraft: Engineering in Nature's style

Dr. S. Arunvinthan

- ❖ The word “Biomimetic” is derived from two Greek words namely “bios” which means life and “mimesis” means mimicry. It was first coined by Otto H Schmitt during the year 1957. Biomimetic is defined as the study of structures and functions of biological systems in the design of engineering systems. Several man-made engineering designs are inspired from the nature since the nature offers the best solution for every challenge through evolution. The imitation from the nature is as simple as a Velcro to a complex stealth shape inspired from the eagles.
- ❖ In this short note, we will discuss how biomimetic can be employed to solve some of the classical problems of aircraft like limited operational capability and drag reduction. One such fascinating biomimetic study is about the acrobatic manoeuvres
- ❖ of Humpback whales.
- ❖ Since the Humpback whales are known for its huge size, it cannot hunt down its prey in water and therefore uses a co-operative feeding method called bubble net feeding.
- ❖ During this feeding, humpback whales perform extreme acrobatics like tight underwater rolls, loops and somersaults. Aerodynamic designers found that the pectoral flippers of the humpback whales have a unique rounded structure called tubercles which is believed to be the reason behind the increased agility of the whales.
- ❖ Being incorporating this technology into the aircraft wings, wind tunnel test results revealed that the modified wings with leading-edge protuberances continues to produce lift even at $\alpha = 45^\circ$ while the conventional straight wing stalls at $\alpha = 15^\circ$.

- ❖ This in turn could help reduce the take-off and landing distance for civil aircrafts and also could improve the turn radius of the aircraft which has a huge potential for fighters.
- ❖ However, a small increase in the drag coefficient has been found. In order to reduce the drag, again another biomimetic solution has been acquired, but this time from a high speed Shark.
- ❖ Morphological investigation of the Short Fin Make shark scales revealed that each and every scale is capable of flexing and bending at an angle ranging between 30° to 50° called bristling angle (β).
- ❖ This bristling angle helps changing the nature of the surrounding flow by eliminating the vortices arising out of the body.
- ❖ Utilizing this technology in aircraft wing proved to reduce the coefficient of drag by 20% says wind tunnel testing.
- ❖ Hence, it becomes clear that nature has provided another viable solution to the classical problems of aircraft thus resulting in the design of future “Biomimetic Aircraft”.



An Insight into Ear Biometric Recognition Techniques

Dr. R Sowmyalakshmi, Assistant Professor Dept. Of ECE

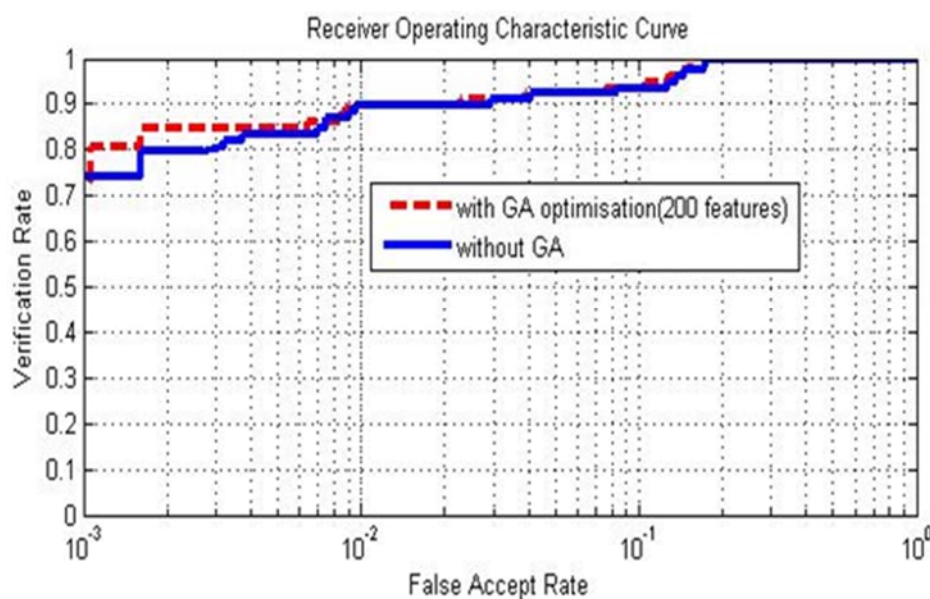
An Insight into Ear Biometric Recognition Techniques Recognition of human has become indispensable in every walk of life ranging from human authentication in airports, identification of criminals by police and up to user recognition for access of library resources. Human recognition can be successfully performed using several life science metrics in our day-to-day life with the help of recent state-of-art techniques in human recognition.

Biometrics deals with human recognition using computational life science measurements and with the deployment of biometric technology, the inappropriate use of debit/credit cards in commercial applications as well as impersonation at polling stations during elections, airports can be drastically reduced. Biometric systems use a variety of physical or behavioural characteristics called modalities, including fingerprint, face, hand/finger geometry, iris, retina, signature, gait, palm print, voice pattern, ear, hand vein, odour or the DNA information of an individual to establish identity. In all these biometric systems involving various modalities, the cooperation of the subject is the most important aspect for the success of a biometric authentication system.

The necessity to capture the biometric identity of a non-cooperative individual in public places or constrained environments is highly required due to the threats of terrorists and anti-social elements. This leads to non-invasive method of acquiring the biometric identity of an individual in such really challenging environments. Ear Biometrics is one of the non-invasive biometric techniques, into practical use for security applications in recent years. Feature extraction plays a vital role in any object recognition task. In any biometric recognition system, highly discriminative unique features are extracted from the pre-processed biometric modalities. For ear biometric recognition, the input ear image is first pre-processed to improve its overall visual appearance.

The desired ear region is segmented out from the pre-processed image using constrained Delaunay triangulation segmentation technique. Robust and computationally efficient texture features are extracted from segmented ear modalities and these features uniquely represent ear images of different persons. Further redundancy can be removed by reducing the dimensionality of the extracted feature vectors using Genetic Algorithm based feature selection. These texture based features are extracted from both training (gallery) as well as test (probe) ear images. The performance of the ear biometric recognition system is studied by testing the feature vectors of test (probe) ear images using K Nearest Neighbour (KNN) classifier and Euclidean distance classifier.

Testing is carried out using IIT Delhi and an internal GEAR ear database images. Performance curves of the investigated ear biometric recognition system are studied by plotting Receiver Operating Characteristic Curve (ROC), Cumulative Match Characteristic (CMC) and Expected Performance Characteristic (EPC) curves. Highly appreciable Rank one recognition rate of 94.9% and more is achieved for texture feature extraction based Ear biometric recognition systems. This could pave the way for the development of non-invasive Ear Biometric recognition systems in the near future. Dr. R. Sowmyalakshmi Assistant Professor Department of ECE University College of Engineering (BIT Campus) Tiruchirappalli – 24.



MIMO Precoding in 4G and 5G Wireless Technologies



By - Dr. SBM PRIYA

The term wireless communication was introduced in the 19th century and wireless communication technology has developed over the subsequent years.

The insatiable demand for high speed mobile data is generating a series of demanding design challenges as today's cellular base stations strain to handle increasingly saturated RF spectrum.

The 4G and 5G are the two recent wireless technologies used in mobile communication to fulfil the requirement of high speed data rate.

The 4G (4th Generation) brought all IP services, and fast broadband internet access while 4.5G (LTE advanced) doubled the data speed from 4G. The upcoming 5G technology aims to expand the broadband wireless technologies from mobile internet to IoT (Internet of Things).

The higher performance in 5G requires various changes in techniques to improve system performance. One of the formative techniques in improving the data rate of 4G and 5G technologies is MIMO (Multiple Input Multiple Output) and massive MIMO respectively.

The MIMO is a system comprising of multiple antennas at transmitter and receiver to improve the system overall performance. The 5G technology enables base stations to support many more antennas than 4G base stations which increases the spatial resolution and consequently increases the spectral and power efficiency of the communications systems.

In wireless transmission, the signal may be reflected off buildings and other obstacles. And, these reflections will have an associated delay, attenuation, and direction of arrival causing multi user interference (MUI) among signal.

Hence, to ensure reliable downlink transmission, precoding at the base station (BS) is one of the major design aspects to improve the system performance.



Designing an apposite precoding algorithm ensuing dexterous performance with nominal computational complexity is considerably a challenging process in real time scenario. Here, a linear precoder design is discussed to minimize the computational complexity.

A low complex linear precoder is designed by replacing the high complex SVD with QR decomposition and QR-Principle Component Analysis (QR-PCA) for complexity diminution. The simulation results prove that the proposed PCA-MMSE-BD algorithm accomplishes moderately improved sum-rate, lower Bit Error Rate (BER) and simple receiver structure in comparison with the existing precoder.

References

1. Priya, SBM & Kumar, P 2017, „Design of Low Complex Linear Precoding Scheme for MU-MIMO Systems□, Wireless Personal Communications, vol. 97, no. 1, pp. 1097-1116, ISSN: 0929-6212.
2. S Biswas, J Xue; F Khan, T Ratnarajah, “Performance Analysis of Correlated Massive MIMO Systems with Spatially Distributed Users,” IEEE Systems Journal, Vol. 12, No. 2, pp. 1850-1861, June 2018.

Revealing the Secrets of Search Engine

Dr. K. Latha, Anna University

- ✚ This Lecture focuses on the Search Engine design issues and solutions to the problems.
- ✚ Some of the issues are, use of Web search engines to find results in foreign languages (Dirk, 2008), Duplicate content penalty, Search Engine Spiders Can't Index Pages, and Losing Visibility by Duplicating Titles (originally published: Search Engine promotion help)

A Search Engine Technology

- ✚ A search engine (Wikipedia) is an information retrieval software program that discovers, crawls, transforms and stores information for retrieval and presentation in response to user queries.
- ✚ Search engines provide an interface to a group of items that enables users to specify criteria about an item of interest and have the engine find the matching items.

Relevance Feedback (Improvisation of Search Engines)

- ✚ The idea behind relevance feedback (Wikipedia) is to take the results that are initially returned from a given query, to gather user feedback, and to use information about whether or not those results are relevant to perform a new query. There are three types of feedback: explicit feedback, implicit feedback, and blind or "pseudo" feedback.





- ✚ Explicit Feedback: Users may indicate relevance explicitly using a *binary* or *graded* relevance system. Binary relevance feedback indicates that a document is either relevant or irrelevant for a given query. Graded relevance feedback indicates the relevance of a document to a query on a scale using numbers, letters, or descriptions (such as "not relevant", "somewhat relevant", "relevant", or "very relevant").
- ✚ Implicit feedback is inferred from user behaviour, such as noting which documents they do and do not select for viewing, the duration of time spent viewing a document, or page browsing or scrolling actions there are many signals during the search process that one can use for implicit feedback and the types of information to provide in response.
- ✚ Pseudo relevance feedback, also known as blind relevance feedback, provides a method for automatic local analysis. It automates the manual part of relevance feedback, so that the user gets improved retrieval performance without an extended interaction.

Problems with the use of Web search engines to find results in foreign languages

- ✚ The language of the target document is important because it determines whether the user can understand the search results. There are some issues with specific languages that search engines have to face and focus on the language identification aspect of search engines
- ✚ Search engines consider language factors when ranking results. However, these rankings should not be confused with geographically dependent rankings, which employ the location of the user (as determined by his IP address or the country interface) and provide a higher ranking for documents from the user's country than from foreign countries.

Duplicate content penalty

- ✚ Duplicate content can happen if web pages publish the same articles, if different domains point to the same web space or if webmasters steal the content of other pages.
- ✚ If two shops sell the same item and use similar shop systems, some product pages can also look like duplicated web pages.

- ✚ Solution: Not all web pages with the same content have the same search engine rankings. If a web site is older than another, if it has better inbound links and if that site has more content than it's likely that it will get better rankings than another page that lists the same article.



Search Engine Spiders Can't Index Pages

- ✚ Web designer has created a beautiful page with nice graphics and great Flash animations. Unfortunately, it seems that search engines won't list your website no matter what you do.
- ✚ Search engines use very simple software programs to index your web pages.
- ✚ A web page that looks great to the human eye can be totally meaningless to search engines. Search engines cannot see content that is presented in images (GIF, JPEG, PNG, etc.), Flash elements, JavaScript and other script languages or other multimedia file formats. If you use JavaScript
- ✚ links for your website navigation then search engines might not be able to find your website page.
- ✚ Solution: If you want to get high rankings for a special keyword then this keyword must appear in the right places on your web page. For example, it usually helps to use the keyword in the web page title.

Title Tags for search engines

- ✚ Avoid Duplications: Sometimes taking simple steps can make a noticeable difference in the visibility of your Web site.
- ✚ Although duplicating titles and Meta tags across multiple pages on your site will not get you in potential keywords and phrases that people might search on to find you.



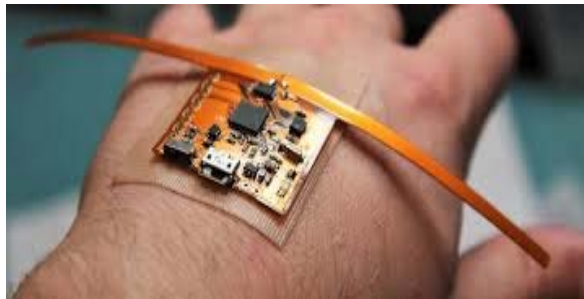
- ✦ You should use as many of them as you can. A good way to start is to double check that your page titles and Meta tags are unique and have been properly optimized for each page.
- ✦ Regionalize Your Title: If your business primarily seeks local or regional business, include your city, state, or region in your title.
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RFID Based Wireless Sensors for Structural Health Monitoring

Dr. C. Geetha, NIT

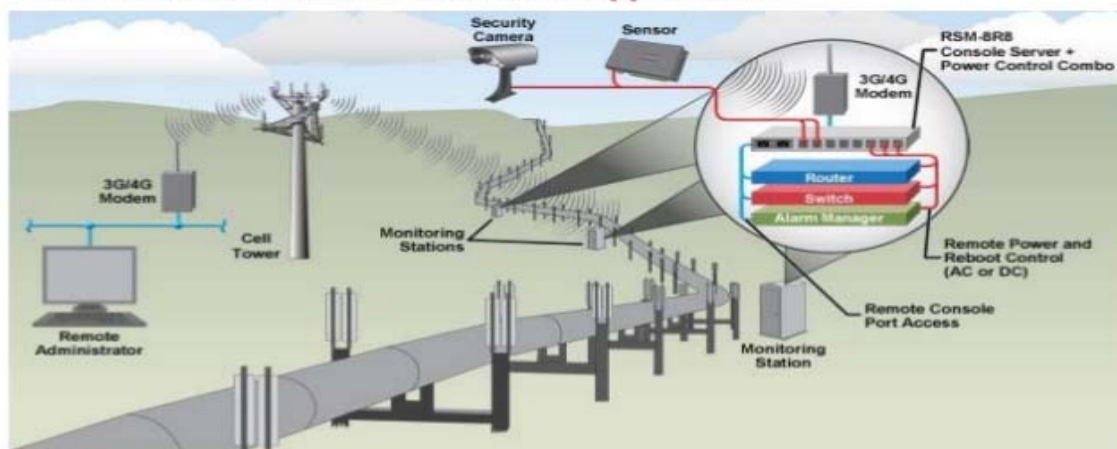
- Recent advancements in sensor technology, rapidly increases the growth of condition monitoring of engineering structures.
- The various structural components are fabricated using metallic materials are subjected to severe fatigue and impact load condition, reducing its strength gradually with time.
- Though the engineering structures are designed against fatigue failure, more than 50% of mechanical failures are due to fatigue crack.
- In engineering structures, small cracks lead to inadequate serviceability and large cracks can result in structural failures.
- Hence continuous Structural Health Monitoring (SHM) is essential for the exponential increase of infrastructure, which demands cost effective reliable and passive sensors with small size to detect mechanical defects



- Periodic inspection using conventional acoustic, electromagnetic and visual inspection techniques are laborious, lengthy and expensive.
- Different types of crack sensors have been developed, and the most commonly used sensors were the strain gauge and optical fiber sensors.

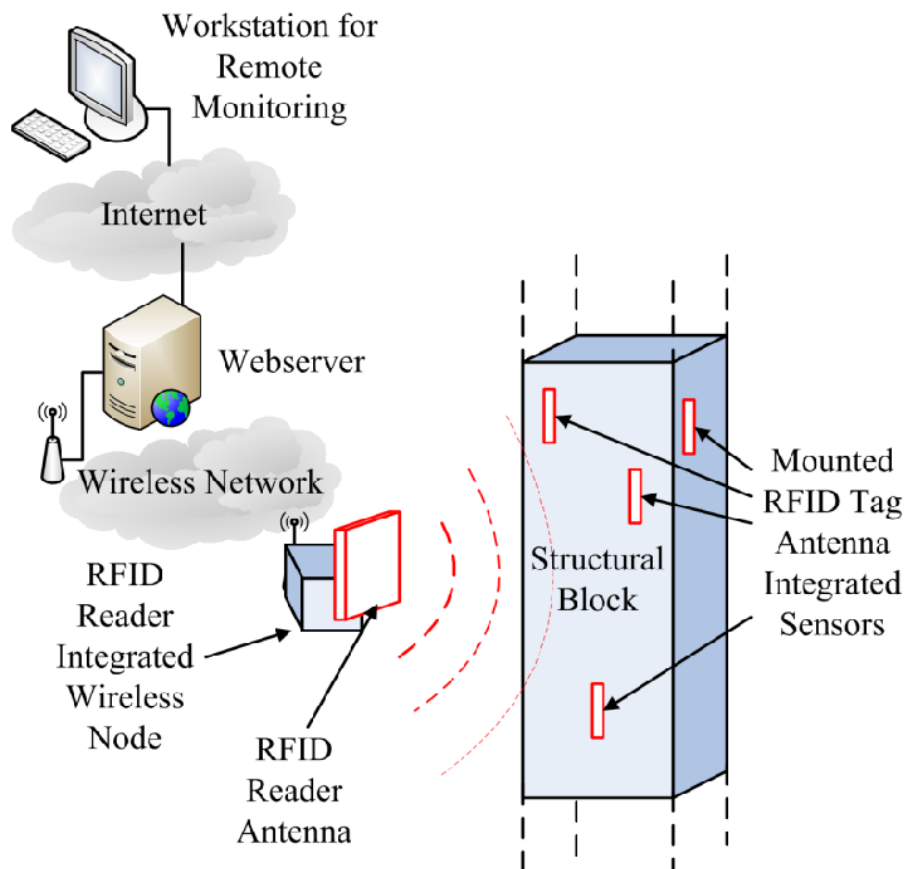
- However, large structure requires a network of sensors, strain gauges are not suitable for SHM systems due to complexity and wiring.
- Even though optical fiber - based strain sensors are an attractive choice of sensor for SHM systems, the inherent shortcomings such as expensive interrogation equipment, limited strain range for crack detection and fragility, etc., have not been resolved.
- Due to the high instrumentation cost and measurement complexity in gathering large amount of real time data from engineered structures, wireless structural health monitoring is gaining significance.

1.4. Wireless SHM Architecture and Applications



- Radio Frequency Identification (RFID) sensor is one of the cheap and easily implementable technologies for wireless strain sensing as reported in the literature.
- This method has gained lot of attraction in recent years due to their passive, low-cost, cost-efficient solution for NDT, pervasive monitoring and wireless characteristic.
- A basic RFID system consisting of three major components namely, transponder (RFID tag) on item, reader and reading system (computer).

- The transponder is an electronic tag which consists of an antenna and RFID chip. The tag scavenges its operating power from the reader interrogation signal.
- The backscatter signal from the tag includes a tag electronic product code and some measurable parameters such as received signal strength indicator (RSSI) and phase.
- Evolution of low cost RFID based sensors enables wireless monitoring of mechanical damages and crack propagation for continuous health monitoring of structural components.
- Besides condition monitoring of structures, RFID sensor finds potential applications in positioning and tracking, bio-monitoring, human activity recognition and food quality and safety.



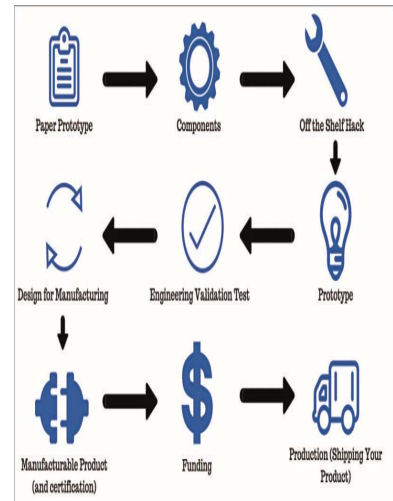
Rapid Product Development through 3D Printing

Dr. P. Senthil, NIT

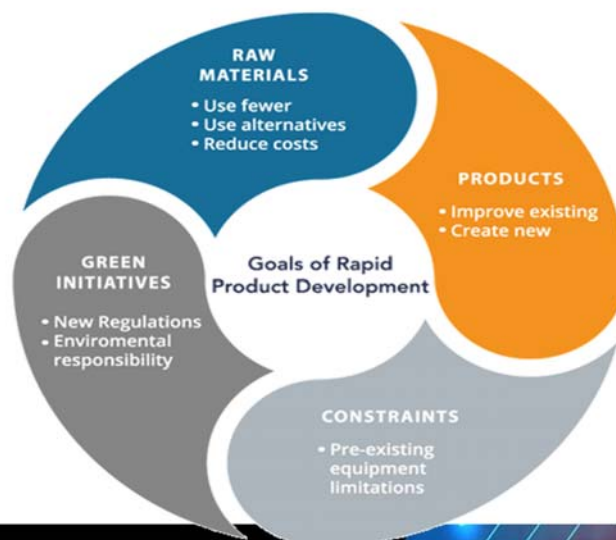
✚ Department of Production Engineering, National Institute of Technology, Tiruchirappalli

✚ This lecture starts with the role of Rapid Prototyping in product development, basics of Rapid Prototyping processes.

✚ Classification and details of Rapid Prototyping processes for 3D Printing. Rapid Prototyping extension for tooling and manufacturing will be discussed.



✚ Trends of 3D Printing, and applications will be presented. Industrial applications of 3D Printing will be deliberated.

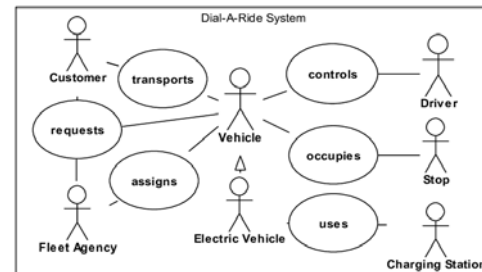


Modelling of IOT Systems Using UML diagram

Dr. C. P Indumathi, Anna University

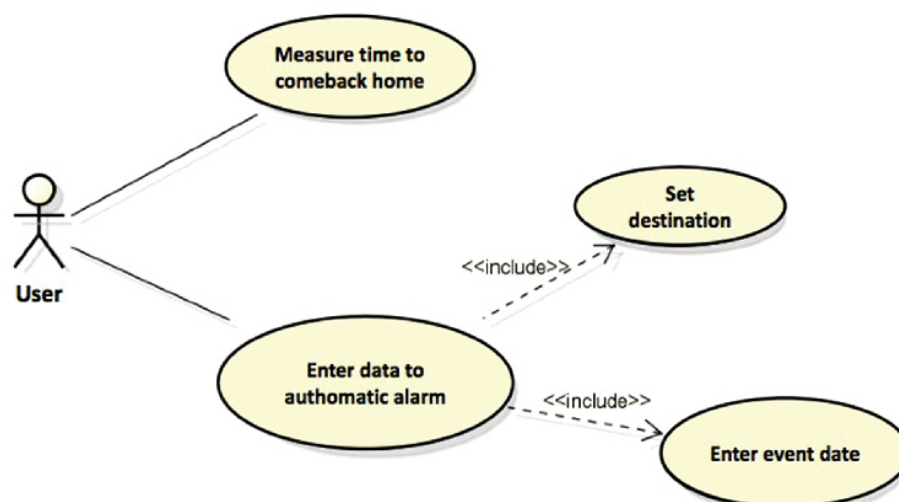
- Internet of Things (IoT) is changing the world.
- The term “Internet of Things” (IoT) was first used in 1999 by British technology pioneer
- Kevin Ashton to describe a system in which objects in the physical world could be connected to the Internet by sensors to count and track goods without the need for human intervention.

- Today, the Internet of Things has become a popular term for describing scenarios in which Internet connectivity and computing capability extend to a variety of objects, devices, sensors, and everyday items

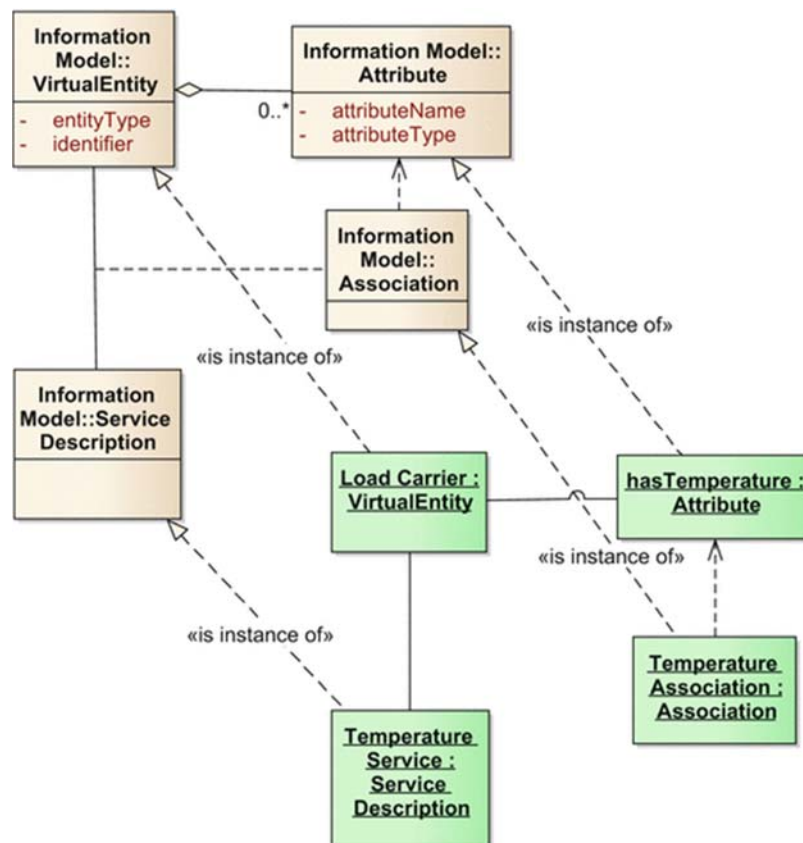


- Software engineering as a discipline provides the necessary platform to carry on the underlying design, coding, implementation as well as maintenance of such systems.
- With the abundance of applications that have emerged due to the IoT concept, there are a number of underlying processes that now need to be generalized as for example the data gathering, service discovery and the interfaces design.

- The contributors to successful software for IoT are mainly the designers, testers and the developers. However, their level of association to an IoT project is different.
- An application designer works with the design of the application while the tester and the developer are more connected to the simulation, programming framework and execution platform backend.
- UML diagrams aim to guide the IoT design to a more standardised methodology of development and deployment. UML (Unified Modelling Language) is a standard visual language adopted by the OMG.
- It presents a visually comprehensible outlay of the construction of IoT systems. This lecture covers the modelling of IoT systems using UML diagrams.
- For instance, there are several proposals for model-based approaches for developing IoT applications, e.g. the Thing ML language as well as other proposals.



- The motivation for model-based development is to describe a system on a higher level of abstraction. Typically, this is done in UML and other languages by diagrams modelling specific aspects or views of a system.
- Moreover, UML is the most used language for software architecture description in industry.
- Approaches the programming of IoT systems through visual programming based on UML to enhance its usability for people without engineering background



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