



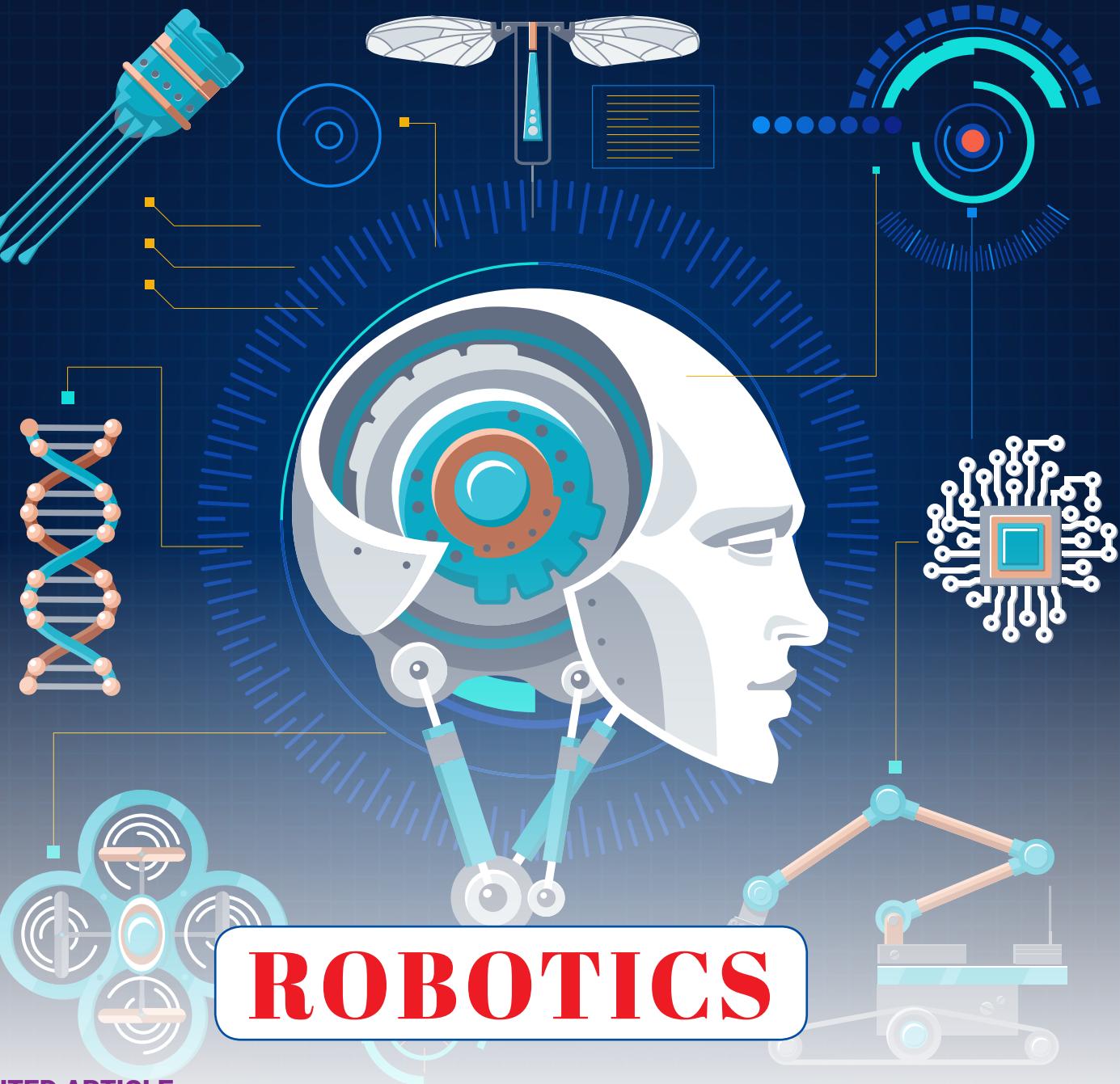
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From the Desk of Chairman, Publication Committee



Dear Fellow Members,
Greetings.

The three publications of CSI viz., CSIC, Journal of Computing and CSI Adayan are coming out well. Thanks to Prof. A. K. Nayak.

When we go back in the memory lane, the development of Computer Technology in India dates back to around 1950s. The advent of IBM 1401 was around 1959. This computer was aimed at replacing unit record equipment for processing data stored on punched cards and at providing peripheral services for larger computers. Subsequently, IIT Kanpur got an IBM 1620 in 1965 and an IBM 7044 a year later. These institutions became a hub for India's first breed of programmers.

Many of us used to perform scientific computations using IBM 1620. For solving complex problems we used to go to IIT Madras where IBM 370 (successor to IMB 360 series) was available. Indian Institute of Science (IISc) and India Meteorological Department (IMD) Delhi were having CDC supercomputer Cray. The main credit of introducing super-computers goes to the inventor of CDC - 6600, Seymour Cray. The CDC 6600, released in 1964, is generally considered the first supercomputer.

Nowadays an advanced desk top/laptop computer is as powerful or even more

than these. Over the years, technology wise, lots of developments have taken place world over. New subjects like Data Analytics, Data Science have been introduced. We need to catch up with these developments and forge ahead.

Prof. V. Rajaraman whose highly informative and knowledge oriented articles are being published in CSIC, has written an excellent up-to-date informative book titled: Groundbreaking Inventions and Communications Technologies. The title of the book itself speaks as to what this book is about. A review of this book appears in CSIC.

Mark Zuckerberg - Originator of Face Book:

One of the most recognized names in the field of IT is Mark Zuckerberg. He is the founder of the most widely used social networking tool of our era viz., Face Book. Today the platform has become a place for friends and families to connect themselves, and businesses to build brand identity and engage with customers.

I do hope that these contributions of legends in Computer Technology will motivate our student community/professionals.

With best compliments

Dr. D. D. Sarma

Chief Scientist (R), CSIR-NGRI, Hyderabad



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Editorial



Prof. (Dr.) S. S. Agrawal
Chief Editor



Dr. Ritika Wason
Editor

Dear Readers

"Whether we are based on carbon or on silicon makes no fundamental difference: we should each be treated with appropriate respect." - Arthur C. Clarke

The above quote By Arthur C. Clarke, British writer of 2010: Odyssey Two introduces the alternative human beings in our current smart world. As per Wikipedia, a robot is a machine-especially one programmable by a computer - capable of carrying out a complex series of actions automatically. Robots can be guided by an external control device or the control may be embedded within.

In today's world robotics have already penetrated into our lives in a big way. We dedicate this issue to understanding and appreciating the role robotics are playing in this smart computational world. Continuing with our invited series Titbits from the History of Computing –XV by the legendary Prof. V. Rajaraman, this issue discloses, "The first commercial high level programming language". This article uncovers the development of FORTRAN. The New Education Policy-NEP2020 is a revolutionary move the government to overcome the limitations of our 34-year educational framework. Keeping this in mind, we include another invited article in this issue, "Nuances of National Education Policy-2020 in Modern Era" by Prof. Sanjay Kumar and Prof. A.K. Nayak. The first article, "A Complete Conspectus of Robotics and Automation" by A. R. Revathi and P. Rajalakshmi delves into the details of robots and their applications. The next article, "The Building Blocks of Robotics" by Himani Mittal details the development and applications of robots. The article, "Robotics: Building Alternate Humans" by Pradnya Hukkeri, Sushmitha S. and Vanishree M. L. uncovers the history and applications of robotics. The next article, "Robotics as a Learning Tutor and its Aid in Education" by Yuvaraj and Snigdha Sen details how robots are aiding in education in different capacities.

The research front showcases, "Artificial Intelligence and Robotics: A Research Overview" by S. Balakrishnan delves into the inter relationship between artificial intelligence and robotics. The next article, "A Study on Social Impact of Robots in Human Life" by Dweepna Garg, Amit Ganatra and Ketan Kotecha unveils the impact of robotics on human life. The next article "Cognitive Robotics: Research Questions" by Snehasis Banerjee traces the domain of cognitive robotics and its applications.

The technical trends section commences from the article, The next article, "Role of Sensors in Robotics" by R. Umamaheshwari, M. Senthil Kumar and B. Chidambararajan highlights the role of sensors in robotics. The last article, uncovers the future with quantum computing, "Robotics: A Future Space [Boon or Threat]" by Sharan S. and Anand Panduranga unveils the evolution of robotics. The article, "Evolution of AI into Machine Learning and Deep Learning: A bird's eye view" by Achuthsankar S. Nair highlights the role of Machine Learning and deep learning in AI.

The special article section highlights, "Java celebrates its Silver Jubilee" by Xavier Chelladurai elaborates the history and details of Java.

Computer Society of India (CSI) has always endeavoured to promote knowledge dissemination among the computing professionals and students throughout the nation. In this endeavour, the current issue also introduces its executive committee members

of 2020-21/22. We also declare CSI SIG eGovernance Awards 2019-20. Nominations for the same are invited in digital mode. Call for nominations for CSI National Elections 2021-22/23 has also been declared in this issue. Call for papers for other CSI publications like CSI Journal of Computing and CSI Adhyayan have also been included for the information of prospective contributors.

The legendary Prof. V. Rajaraman has also authored a book, "Groundbreaking Inventions in Information and Communication Technologies" published by PHI Learning Pvt. Ltd. Prof. D.D. Sarma, Chairman, Publication Committee and Prof. A.K. Nayak, immediate Past President, CSI have given a brief overview of this book in the form of book review for reader knowledge.

The issue also reports various webinars, student branch inaugurations and faculty development programmes conducted by various regions of CSI. A new trend in education / communication is very clearly visible that people have resorted to "online mode and the virtual mode for teaching and learning" at various levels. The experts in computer science and the CSI are assisting and showing the way for its effectiveness. It is very encouraging to see the reports from various chapters, specially the student chapters. We applaud all chapters and branches for conducting such activities even in these hard times. Varied student branch activities as well as workshops carried by different regional chapters of CSI like industrial visit and programming competitions have also been reported.

The call for papers for CSI 2021 and other student conventions has also been included for the information of readers and prospective authors.

We are extremely thankful to all our contributors as well as readers. We are continuously receiving so many good quality articles each month that selection becomes a difficult task. May God bless you all with extreme strength and well-being to overcome these hard times safe and sound. Original, plagiarism-free, unpublished articles are solicited throughout the year from CSI members as well as non-members. Our sincere gratitude to the CSI publication committee members, editorial board members, authors and reviewers for their great contribution and support in realising this issue.

Our special thanks to Prof. A. K. Nayak, Immediate Past President, CSI for his constant encouragement, support and guidance in publication of October, 2020 issue.

We look forward to receive constructive feedback and suggestions from our esteemed members and readers at csic@csi-india.org

With kind regards,

Prof. (Dr.) S. S. Agrawal

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President's Desk



From : President, Computer Society of India

Date : 01 October, 2020

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Dear Members,

With rapid relaxations introduced by the government after the difficult phase of pandemic Covid-19 in the country. Most of us have practically started our daily routines as before the pandemic and started moving to our Institutes & offices working as per new norms of safety issued by government. All of us has started working as usual, except few restrictions for conducting activities in online mode only. But we should properly follow the norms of safety to keep us safe.

This issue of CSI communication is on robotics. Robotics is a science of design, construction, operation, and use of robots. Intelligent machines which are used to assist humans in day-to-day work and keep everyone safe is the basic aim of robotics. Intersection of science, engineering and technology produces machines named as robots, which replicates human actions. Robots works as body structure with muscle system to move this body structure; it contains sensors to receive information about body and surrounding environment, have power supply to activate sensors and muscle, along with logical system which works as brain to process various instructions. In today's environment of pandemic we have seen robotics being used widely in health science at research level and for day to day work in hospitals. In most of the industrial establishments nowadays robots are used. Computer Scientists are the persons behind most of the robotic applications as they are implanting various AI techniques for developing intelligent robots. Number of contributors had submitted their Research papers for this issue of CSI communication on theme of Robotics. Their work had been reviewed by the experts and quality papers are published in current issue. These papers & articles will encourage researchers and professional to move forward in the area of robotics.

Chapters & Student Branches are continuing their dynamism & vibrant contribution and are organizing quality activities at local to International level in online mode. The activity reports of chapters & student Branches published in current issue once again gives the qualitative picture of CSI activities. I once again thank the organizers & members of the chapters & student branches for their hard work & significant contribution for their own professional growth & growth of CSI. In the current issue we are publishing the call for elections of CSI Executive Committee for the year 2021-22/23 and I request all members to take part in the democratic process and make CSI more vibrant. In last issue YITP Award, IT-Excellence Award, e-governance Awards and call for organizing State Student Convention & Regional Student Convention was published, I once again request for wider participation in these activity. Next CSI Annual Convention on the theme "Digital Transformation: e-Readiness for Self-Reliance" will be held at Lucknow from 11th to 14th February, 2021, I request for wider participation of IT professionals, students and Institutions across the strata in the coming Annual Convention.

We are continuing with 15% concession in the life membership during pandemic period to attract more & more professional & bring them together for the growth of IT, the details are available on our web portal www.csi-india.org.

Once again I thank all Past Presidents, Fellows & Members of CSI for their continued patronage & support.

Stay Safe, Stay Connected.

With warm regards,

Mr. Ram Krishan Vyas
President, CSI

Titbit from the History of Computing–15

The first commercial high level programming language

► **V. Rajaraman**

Emeritus Professor in the Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore. Email: rajaraman.v37@gmail.com

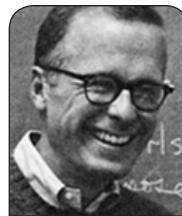
“We must remember that one determined person can make a significant difference and that a small group of determined persons can change the course of history” – Samuel Johnson

The Cambridge dictionary meaning of titbit is “A small and particularly interesting item of gossip or information”.

Prologue

The earliest high level programming language called Plankalkül was designed by Konrad Zuse in 1948. It was binary oriented non von Neumann language that was not implemented. It was unknown outside Germany as it was developed in Germany during the second world war [1]. The first two persons to design and implement a high level programming language for a stored program electronic digital computer were Halcombe Laning and Niel Zierlar in 1953 at MIT, USA. The language used single letters for variable names, could translate statements such as $A = B + C$, had built in routines for trigonometric functions and allowed simple loops. They wrote an assembly language program for translating programs written in their high level language to machine instructions of the Whirlwind I computer [2]. This computer had a magnetic core RAM with 1024, 16 bit words. This small size RAM was a serious limitation for writing a translator for the language and it is to their credit that they wrote one that worked. The machine language compiled by their translator was about 10 times longer than a hand coded assembly language program to solve a problem. As it was inefficient it was not widely used. Some research projects to design high level languages for computers were carried out in Germany and England during the mid 1950s but did not aim to obtain efficient object codes on commercial computers.

During the 1950s assembly language was used to write all programs. Writing programs was time consuming as one had to understand the architecture of the



John Backus



Harlan Herrick



Irving Ziller



Robert Nelson

The initial IBM FORTRAN development team (Photos courtesy IBM archives)

computer in addition to the algorithm to write an assembly language program. As a programmer put it “programming was a hand to hand combat with the computer”.

Development of FORTRAN

John Backus who was a programmer at IBM at their New York office calculated that the cost of developing programs for IBM computers using assembly language was nearly the same as the cost of the computer hardware which was quite high in the 1950s. Besides this, the difficulty of programming in assembly language inhibited many engineers and scientists from using computers to solve their problems. He felt that there was a need to develop a better language to simplify programming. In 1954 IBM released model 704 computer specifically to solve numerical problems arising in science and engineering. It was the first computer with hardware floating point arithmetic unit and had three index registers. It used vacuum tubes, had 4K words (36 bits/word) RAM built using magnetic cores, magnetic tapes as secondary memory, card reader and printer as I/O. It cost US\$2 Million. In December 1953 John Backus wrote a memo to his manager explaining that programming cost using assembly language was becoming very high and there was a need to develop a higher level language that was

easy to learn by non-programmers such as engineers and scientists and a translator to translate it to machine code. His proposal was quickly approved and he was allowed to hire programmers to develop a high level language and its translator. Backus was convinced that such a language would not be accepted by users unless the translator of the language produced machine code as efficient as that produced by professional assembly language programmers to solve problems. Thus from the outset his aim was not only to design a high level language appropriate to solve problems arising in science and engineering but also to make its translator produce machine code approaching the efficiency of a human coder [3].

The team to develop the system was put together gradually with new employees joining the team as the project progressed. The first person employed by Backus was Irving Ziller in January 1954 who was joined by Harlan Herrick in May. The third employee was Robert Nelson, a cryptographer, who was hired as a technical typist but soon became a programmer. Backus, Ziller, Herrick and Nelson formed the core team that started designing the language.

The team did not consider language design as important as the design of a translator to produce an efficient code.

By November 1954 the group prepared a 30 page report: "Preliminary Report, Specifications for the IBM Mathematical FORmulaTRANslating System FORTRAN". In this report they proposed variable names of one or two characters, recursively defined arithmetic expressions which could have constants, floating point and integer variables, arithmetic statement, conditional branch and loop statements subscripted variables with up to three subscripts, and functions. It also had sections on input and output written by Roy Nutt an employee of the United Aircraft Corporation who was loaned to IBM. In the preliminary version, called FORTRAN I, not much attention was paid to debugging programs. Backus mentions that their approach to language design in the early days was quite casual and they added features to the language that they thought would be useful as they went along [3].

After the release of the preliminary report Backus and his team gave five to six talks to prospective users who had ordered IBM 704 expecting feedback to improve the language. They were disappointed as they hardly got any suggestions. Most customers doubted whether the translator could produce efficient code.

The team could compile FORTRAN I programs for IBM 704 and were very happy and somewhat surprised by the efficiency of the translator that produced object code as good as that of an assembly language programmer. However, FORTRAN I had many shortcomings, particularly poor error checking of the source language and short length of variable names. It was improved to FORTRAN II which had six character variable names (possibly because IBM 704 had 36 bit words and each word could store six 6-bit characters), better handling of subscripted variables, FORMAT statements, computed

GO TO, CONTINUE and EQUIVALENCE statement and function definitions.

Compiler Design

Backus and his team underestimated the difficulty of writing an efficient translator for FORTRAN II. They thought it would take six months to write a translator after designing the language but it actually took two years. The four member team that designed the language was too small and nine more members were added as and when there was a need. A research paper describing the first version of FORTRAN II and its compiler was presented in February 1957 at the Western Joint Computer Conference at Los Angeles by Backus with twelve more co-authors [4]. In this paper they mention that after attending a one-day course on FORTRAN II, and with the help of a manual, a programmer could write a FORTRAN II program to solve a scientific problem in 4 hours which he estimated would have taken him 3 days plus an unknown amount of time to debug it if he had used assembly language. The FORTRAN II program had 47 statements and the compiled program 1000 machine instructions. The compiled program was almost as efficient as the manually written assembly program.

The FORTRAN compiler had 24000 assembly language instructions and took 18 man years effort to develop. FORTRAN was officially released in April 1957 and distributed free to all IBM 704 installations. By November 1958 a survey of 26 IBM 704 users revealed that more than half of them used FORTRAN for more than 50% of their programs and some for 80% of their programs. By 1962 FORTRAN was the primary language used by scientists and engineers to write programs.

Epilogue

FORTRAN was the first high level language to be released commercially

and became highly successful due to its simplicity and the efficiency of the code it produced. FORTRAN compilers were written for many models of computers. It made computers accessible to scientists and engineers who were earlier inhibited from using computers as they found assembly language programming tedious and error prone. Improved versions of FORTRAN appeared regularly starting with FORTRAN IV in 1962. The latest version is Fortran 2018. Over 200 high level programming languages have appeared after FORTRAN but it is still widely used by scientists and engineers to program high performance computers 63 years after its invention! Fortran 2018 is very modern and has incorporated many features that simplify parallel programming. Tony Hoare, Turing award winner, said in 1982 "I don't know what the language of the year 2000 will look like, but I know it will be called Fortran" – how prophetic!

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About the Author



Prof. V. Rajaraman (CSI Fellow) Ph.D. (Wisconsin) is Emeritus Professor, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore. Earlier Prof. Rajaraman was Professor of Computer Science and Electrical Engineering at IIT, Kanpur (1963-1982), Professor of Computer Science and Chairman, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore (1982-1994) and IBM Professor of Information Technology, Jawaharlal Nehru Centre for Advanced Scientific Research (1994-2001).

A Padma Bhushan awardee in 1998, he is also a recipient of the Shanti Swarup Bhatnagar Prize in 1976. He is a lifetime contribution awardee of the Indian National Academy of Engineering and the Computer Society of India. (A detailed biodata may be found in en.wikipedia.org/wiki/Vaidyeswaran_Rajaraman).



Nuances of National Education Policy-2020 in Modern Era

► Sanjay Kumar

Vice Chancellor, Symbiosis University of Applied Sciences, Indore

► A. K. Nayak

Immediate Past President of Computer Society of India

Historical Perspective

A well framed Education Policy is the backbone of any country that depicts not only the literacy level of citizens of the country but also prepares a blueprint for the futuristic economy of the country and indicates towards the index of employability. If you recall, the first education policy of India was promulgated when the union government established university Education Commission during 1948 to 49, followed by secondary Education Commission in 1952 to 1953. Thereafter, emerged, was much talked Kothari Commission during 1964 to 66 to formulate a very scientific and methodical modern education policy to give a boost to Science and Technology and modernize the educational program of India. Somewhere in the same decade, standard institutions like IITs and NCERT (1961) also came into being. Then, after two decades or so, the national education policy was framed in 1986 and could witness slight modification in 1992. Since then, no national education policy came forth and finally after a waiting period of 34 long years, the new education policy 2020 was put up by a very competent team led by Dr Krishnaswamy Kasturirangan, former Chairman of Indian Space Research Organisation.

Underlying Motive of New Education Policy

As per the global education development agenda of the Government, the single point agenda is to reconfigure the entire education system "to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030", impart skill and value based education to make each youth of the country self-Reliant and responsible citizen and make this country as Global Education Hub. With rapid advancement in science and technology such as big data, machine learning, deep learning, artificial intelligence, block-chain technology, agile working etc, keeping in view of the dramatic changes in the knowledge landscape, the Indian education system has

to go a long way and do quite a lot to be at par with global standards. The biggest and challenging task is to enhance substantially the GER (Gross Enrolment Ratio) from 50% to 100% at school level and from 26.3% to 50% at higher education level. We have to revive the entire educational culture to be once again in line with our golden days of history of laurels brought by universities like Takshashila, Nalanda, Vikramshila, Vallabhi etc. The ultimate aim is to achieve economic and social mobility, inclusion and equality. The policy intends to build 'foundational capacities' of literacy and numeracy and 'higher-order' cognitive capacities, such as critical thinking and problem solving skills and unleash the creative potential of individual. The guiding light of the new education policy has been India's rich heritage of ancient India and eternal multidisciplinary approach of acquiring knowledge and carrying out high standard research in various specialised domain.

Pivotal Points for Academicians and Researchers

- To promote holistic development and build well rounded personality of students.
- To identify creative potential of each student and nurture them through skill training.
- To develop flexible course curriculums for students so as they can choose their learning trajectories as per their choice, interest and capability.
- To spread awareness about "**No Hard Separation**" between arts, science, commerce etc. and between curricular & extra co-curricular activities and also between vocational and academic streams. Idea is to eliminate completely, silos between different domain areas of learning.
- To foster multidisciplinary approach without having any barriers between science, arts, humanities, sports, yoga, music, performing arts etc.
- To undertake FDP, MDP and emphasize on continuous updating of knowledge and develop strong industry interface.
- To instil conceptual and skill based learning and not to promote rote learning just to reproduce in the examination.
- To encourage distance learning, vocational education and make internship compulsory for students to get adequate hands on training and practical exposure.
- To create environment of creative thinking, team work, cooperation, group learning and innovative ideas.
- To promote continuous and formative assessment and evaluation pattern throughout the academic year.
- Use ICT tools extensively and provide intensive training to students and faculty to take advantage of technology for learning-teaching pedagogy and research.
- To create a very positive learning and teaching environment and foster constitutional values like empathy, respect for others, respect for public property, equality and justice.
- To promote equity and inclusion to provide equal opportunities to all students irrespective of their cast, creed, religion, gender, differently abled/disabled, economic conditions, societal status etc.
- To build centre of academic excellence in various sphere of education and develop very sound research centres clubbed with incubation centres to provide handholding to all start-ups and aspiring entrepreneurs.
- To prepare academic credit bank and chalk out a meticulous plan for multi-entry and multi-exit scheme.
- To take advantage of a "**Light but not tight**" regulatory framework to ensure integrity, transparency and resource efficiency.

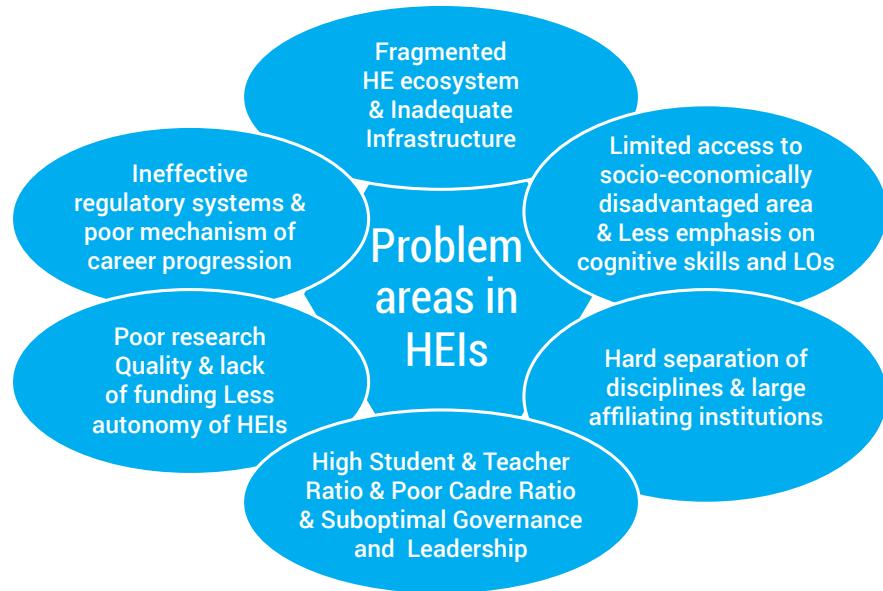
Current Major Issues Faced by Higher Education Institutions (HEIs)

The new education policy has a concrete plan to address all the major areas highlighted in the above picture to strengthen the quality of higher education system. Besides these major areas there are many smaller but yet very significant issues such as availability of licensed and original software particularly for subjects related to science, engineering and technology, poor laboratory conditions, inadequate books, journals, periodicals, political interferences such as various unions, insufficient support staff, clean and green campus, basic amenities such as clean water, green toilets, lab assistants, inaccessibility to good institutions due to no/bad roads, less vacancy of seats, local threats particularly for female students etc.

Good News for Students and Faculty

There are many reasons for students and teachers to cheer up and avail plethora of opportunities which are going to be in vogue as per the recommendations of national education policy 2020. Few important beneficial schemes are enumerated below.

- Various measures have been instituted to incentivise the meritorious students in terms of scholarship, fee waiver and provide substantial financial help to the students belonging to SC, ST, OBC other SEDGs (Student Entrepreneurship Development Group).
- National scholarship portal will be strengthened and expanded to provide support to students eligible for scholarship. The progress will be monitored and there will be no delay in disbursement of scholarship and financial help.
- Students who completed 4-year Bachelor's programme with Research, there could be a 1-year Master's programme.
- Eligibility for undertaking a Ph.D. shall require either a Master's degree or a 4-year Bachelor's degree with Research.
- M. Phil. course will be no longer in existence and loose its relevance.
- Private HEIs fees will be very well regulated and no institution will be allowed to have monopoly to fix their own fee structure. Commercialization of education will be fully curbed. Requisite multiple checks and balances mechanism will be kept in place to



safeguard the interest of students.

- Larger seats will be made available by private institutions to accommodate students.
- Teaching load will be reduced and student teacher ratio will be maintained so that the activity of teaching remains pleasant, more sought after, not stressful and there will be adequate time for interaction with students, conducting research, participating in extracurricular activities, presenting papers, conducting symposiums and other activities of the university.
- Teacher's transfers will be minimal and they will not be tasked for election and all other such duties so as they remain committed to their institution and community.
- Teachers will be fully empowered to design, develop their own choice based course curriculums, adopt innovative teaching methodology and involve in research activities.
- Teaching and research excellence will be incentivized through appropriate rewards, promotions, recognitions, and upward movement into institutional leadership.
- A very transparent and merit based criteria will be very well laid for the teacher's recruitment.
- A system will be made in place to look after the fast track promotion in each HEI.
- Extra ordinary teaching fraternity may get out of turn promotion and will get

opportunities to participate in various international seminars at the cost of the institution.

- Lot many scholarly grants will be made available to enthuse and motivate students and teachers to undertake innovative projects/research to Make India Self-reliant.

Envisaged Major Challenges in Implementation of the Policy

Although, the policy apparently appears to be very rosy and forthcoming which is not only historic but fall in line with global education standards. However, the implementation of the policy will be a herculean and daunting task to meet the time line. Following are the major challenges and hick-ups that may pop up, during implementation phase of the policy that might be required to be tackled very efficiently and carefully to iron out anomalies and meet expectations of students, teachers, professors, promoters, educationists, scholars and parents.

- About 350 million Indians today, are falling in age group of school-going/ college-going bracket. Implementing the NEP in true letter and spirit will be a huge task.
- Establishing fairly large number of HEIs in underserved and disadvantaged region to have full accessibility, equity and inclusion.
- In India, we have about 1000 universities including central, state, deemed, and private universities. To

- enhance GER from 26.3% (2018) to 50% by 2035 amounts to opening couple of universities each month. It will be a Mammoth task.
- Creating a large pool of trained and qualified teachers to impart skill training to students in school and colleges.
 - Establishing at least one large multidisciplinary education institution in every district having more than 3000 students.
 - Aligning the provisions of Right to Education Act and the New Education Policy (NEP) 2020 and removing all anomalies.
 - Enrolling more than 2 Cr. dropout students and bringing them into the mainstream. For this, we may require opening of dozens of schools every month and appointing hundreds of teachers each month for next 15 years to enhance the GER from 50% to 100% at school level. It will be a mind boggling and baffling task.
 - Appointing huge number of Ph.D qualified teachers to meet the shortage in each State and Central University.

- Providing huge infrastructure and funding to schools, autonomous colleges and Universities. Allocation of GDP from 4.6% to 6% for education alone amounts to about 2.5 lakhs crores per year. It raises a big question mark in the deadly environment of COVID -19.
- Another challenging task is phasing out thousands of affiliated colleges, converting them into constituent/autonomous and prove them graded autonomy. This is a gigantic task to implement.
- Bringing in paradigm cultural shift among students, teachers, professors and parents from existing conventional education system to value & skill based education system with multi-disciplinary/interdisciplinary, multilingual, multi-entry-multi-exit, academic credit bank approach. It requires complete revamping of analog mind-sets to digital mind sets of each citizen of the country.

be surely a boon for all the aspiring learners and entire teaching fraternity and research enthusiasts, provided it is implemented within the stipulated time frame. In last 34 years of the education system of the country, it has been one of its kind that has paved the golden path of moving back to our rich and much admired era of Nalanda, Takshshila and Vikramshila University. Probably, the dream of India as a "Vishwa Guru" will come true. The policy is perfectly aligned to match the global education standard barring few glitches here and there. Permitting top notch foreign universities to operate from Indian land, will definitely bring in global culture, provide more competitive research opportunities to Indian students, generate sizeable employment and give boost to research and economy as well. However, implementation in totality will be a colossal task. Let us hope for the best and feel proud to be integral part of the education policy and contribute significantly to make this country as "Vishwa Guru".

Conclusion

The New Education Policy 2020, will

Jai Hind!!

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A complete conspectus of Robotics and Automation

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"Robotics and other combinations will make the world pretty fantastic compared with today"

— Bill Gates, American business magnate

Introduction

Robotics is the branch of Artificial intelligence that mainly deals with a view of designing the intelligence and systematic robots. Robotics have electrical device to direct the machinery and mechanical components to manage the particular task and computer engineers to develop the program that tells "what, when and how the robots should function". Since the robotics are defined as the combination of electrical engineering, computer engineering and mechanical engineering. In 1920, Czech writer Karel Capek introduced the term "Robot" to the world in his play Rossum's Universal Robots (R.U.R). The word "Robotics" was presented by Isaac Asimov in his science fiction short story "Runaround" in 1941.



Figure 1: Unimate

During the year of 1954, George Devol developed the first programmable industrial robot as represented in Figure 1 and described it as "Universal Automation" and later it was termed as Unimation which is the name of the first robot company in the year of 1962. Robotics has the capable of working hard and effective in hazardous areas and produce accurate results as said in [1]. They save more time by performing the assigned task in smarter way.

Laws of Robotics

In 1940, Isaac Asimov recommended the three Laws of Robotics and later he added a "zeroth law"

- First law: A robot can't injure the user or through inaction it allows the user to return to harm, unless it might contravene the higher order law.
- Second law: A robot must follow the orders given by human being, except where such orders would dispute with a higher order law.
- Third law: A robot is allowed to guard its own existence as long as intrinsically protection wouldn't conflict with a higher order law.
- Zeroth Law: A robot is not allowed to injured humanity or through inaction it allows humanity to return to harm.

Components of robot

There are some key components that allow the robot to work in a proper way that have been represented in Figure 2

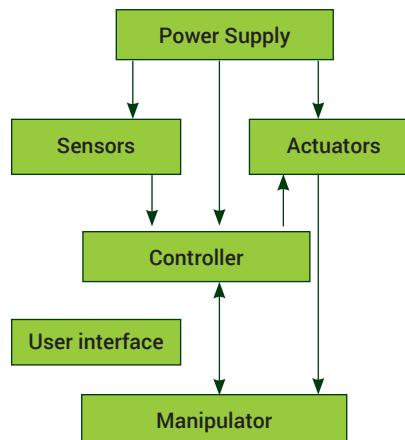


Figure 2: Elements of Robots

power supply to generate the voltage signals which enable the motors turn, the sensors operate and brain of the robots. This can be achieved using batteries, solar power or pneumatic power sources.

- **Sensors:** Without sensors robots could not able to perform a meaningful task. They produce real time information based on their task. Vision sensor is used to know about the depth in the environment and to get the mechanical properties of touch receptors of input tactile sensors have been used. Thus, the sensors are the most essential component of the robot. Sensors are mainly used to measure the quantities such as position, force, velocity, temperature and so on as confirmed in [2].
- **Actuators:** Actuator is the one of the energy conversion device that converts the energy and makes the robot to move. Actuator converts the control signal into mechanical signal such as an electric motor.
- **Controller:** The digital device such as hardware and software guide the robots to carry out the assigned task by receiving an input through various sensors. The Microprocessor is the heart of the robot's controller connected with the input, output and monitoring device. Movement of the manipulator are controlled by the controller.
- **Manipulator:** Manipulator in robots are similar to human arms. In robotics, a manipulator may be a device used to manipulate materials without any physical contact by the user. The applications were primarily for handling radioactive or biohazardous materials,

- **Power supply:** There is a need of

using robotic arms and they are employed in inaccessible places.

Sorts of robots

Nowadays, Robotics plays a vital role in real world environment which have many categories and they are depicted in Figure 3.

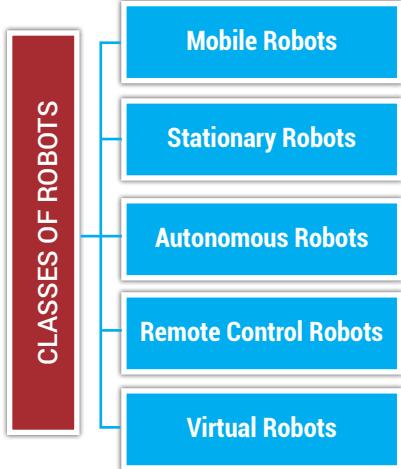


Figure 3: Classes of Robots

- **Mobile Robots:** Mobile Robotics is the device which is supervised by software that makes use of actuators and other technology to perform their task. These robots are not fixed to one location. Mobile Robotics is a solutions-oriented system that design and combine the engineering science and knowledge technology with assist of cognitive model.



a) Rolling Robot



b) Walking Robot

Figure 4: Mobile Robot

Mobile robotics can be expressed as the fusion of computational intelligence and physical elements. Rolling robot and walking robot are the two major divisions of mobile robots as shown in Figure 4. As the name describes, rolling robot move around its surroundings with its wheels and walking robots use their legs to move around. Usually they have 4 or above legs

- **Stationary Robots:** Stationary robots differ when compare to mobile robots.



Figure 5: Stationary Robot

They perform their task at one physical location and cannot move anywhere and they are shown in Figure 5. Robots aren't only want to explore areas or imitate a person's being.

Most robots perform repeating tasks without ever moving inches. Most robots are working in industry as said in [3].

- **Autonomous Robots:** Autonomous robots are the one which have been programmed in such a way to perform the assigned task with high degree of autonomy.



Figure 6: Autonomous Robot

These robots can be used in the situation where there is no need of human control. They have the capable of obtaining

the information about the environment and work for unlimited time. They predict the future defects to avoid the fault. Autonomous robots increase the productivity of workers and decrease the rate of failure and are represented in Figure 6. They are also known as autorobots or autobots.



Figure 7: Remote-Controlled Robot

- **Remote Control Robots:** A person can handle the robots to perform a task with the help of remote control. There is a direct connection between the human and robots and mostly humans have complete control of robots using remote as shown in Figure 7.

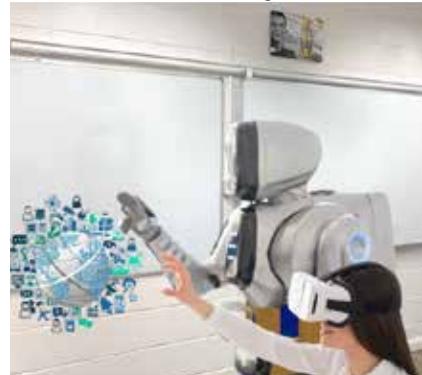


Figure 8: Virtual Robot

Wired remote control and wireless remote control are the two types of remote control robot. The body of the robot and remote have direct interaction through wires or cables are defined as wired remote control.

Wired remote control is used in stationary device, whereas in wireless remote control, the body of the robot are not tethered to the remote by cable or wires.

- **Virtual Robots:** Virtual robots are simulated robots that develop the

Operational stock of industrial robots

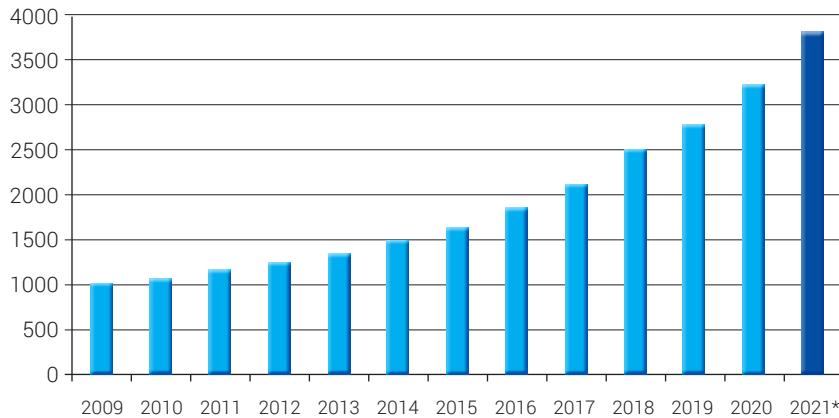


Figure 9: Operational Stock of Industrial Robot

program for robots to perform the task assigned. Simulation is the process of understanding how the physical theories like force and motion play in a real world. Virtual Robot make use of web based techniques to construct EA robots like RoboThespian and SociBot. These robots are used to create the variables for physical robot without assists of an actual machine and save more cost and time and they are represented in Figure 8.

Estimated worldwide operational stock of industrial robot

After visualizing the Figure 9, the conclusion arrives is that the estimated worldwide operational stock of industrial robots increasing gradually during the year of 2009 to 2021. In 2017, the worldwide operational stock of industrial robots increased by 16%. In the upcoming years, growth of operational stock will slightly accelerate and is anticipated to be around 17% on the average each year. After crossing the two million units during the year of 2017, the worldwide operational stock obtained the level of three million units in 2020 and excepting to be 3.8 million units in 2021. This overall trend is mainly imputed to Asia, where the operational stock is expected to be enlarged the annual average rate of 20% in 2021. In Europe, as in America, the worldwide operational stock is grown by 8% in 2018. In 2021, the annual average growth forecast for Europe may increase by 9% and for America it's 10%.

Application of robots

Different jobs are carried out by robots in various fields and the quantity of task assigned to robots is increasing consistently. The great way to separate robots into types is a partition by their application and they are listed below

- **Medical Science:** Medical robots are used in medical science through which Medical practitioners use the robots in such a way to handle the patients in rural or remote areas. Robotic surgery permits the physicians to perform many sorts of difficult procedures with more perfection, pliability and control than is feasible with standardised techniques. Nano robot is the one of the majorly used tiny robot in the medical field and they are represented in Figure 10.



Figure 10: Nanobots

The word "Nano" in Nanorobot refers to billionth. These robots are used to heal the diseases in living being at nano scale dimension. In case of Surgery nanorobot

are injected to humans with the help of vascular to search the pathogens and then to diagnosis. Nano robots also are applicable in treating hereditary infections by relating the sub-atomic structure of DNA and proteins inside the cell. Nano robot with implanted synthetic biosensors is utilized for recognizing the tumor cells in beginning phases of cancer development. Diabetes patients must test their blood for multiple times in order to maintain their glucose level which is inconvenient process to overcome this issue nanorobots have been used to monitor the blood and glucose level of human which transmit the result for every two hours through RF signals. These robots are widely used by hospitals in U.S and Europe. The most commonly used clinical robot-assisted surgical system includes a camera arm and mechanical arms with surgical instruments associated with them.

- **Space robots:** space robotic is the one of the major challenging application of robotics. The robots are the environment that has been enhanced by its association to space research. The word "space" indicated that something infinite. The space research is always dangerous. Sometimes unpredicted events may happen and result in death. It is here that the robots help the scientist in his research application.



Figure 11: Space Robotics

Robot in space is controlled by the human on earth to perform the multiple tasks. The scale of victory in space research is similar to that of biological research that is "survival of the fittest". Use of various technologies of robots in space system saves the cost effective and efficient also and they are shown in Figure 11.

- Agricultural Robots:** Agricultural robots are developed in order to help the farmers in agricultural fields as shown in Figure 12. They are also known as Agribots which act as a farmer to improve the quality of production and to decrease the labour cost. They have the power to work for 365 days without getting tired.



Figure 12: Agricultural Robot

Only thing need to do is maintaining the robots in perfect manner. Harvesting, seeding, sorting, phenotyping, spraying, pruning and autonomous mowing are the some of the application of robots in agriculture industry. Nowadays, human population are increasing cautiously. In 2060, the count of human population may reach to 9 billion in the world and the farmers have to use advanced technologies to keep up with growing demand. "The agricultural

production must double if it is to meet the increasing demands for food and bioenergy" according to IEEE Robotics and Automation Society. Robotics and Automation plays a vital role in the world if the count of the population reaches to 9 billion.

- Military robots:** Military robots come under autonomous robots or remote-controlled robots that have been designed to work in the military for searching the transport and to attack others as shown in Figure 13. Small robots are widely used in military, starting from ISR to underwater mine clearance as confirmed in [4]. Military robots are not any more restricted to science-fiction novels or to a foreign future but became a tactile reality.



Figure 13: Military Industry

US developed the miniature AUV named SandShark. It is of 5 inches of diameter and length ranging from 23 inches to 60 inches counting on the payload. They delivered 10 Sandsharks to Defence Advanced Research Projects agency for experimental purposes.

Conclusion

By understanding the various benefits of robotics, some people may think that the growth in robotics will lower the number of vacancy and kick the people out of their jobs. But this is almost never the case. The development of advanced technologies such as robotics and automation helps the human to do the difficult work more accurately and rapidly. Robots have the capable to work for a long period time without getting tired and handles the critical problems in smart way to produce the improved high quality result. Robotics uses the concept of Artificial Intelligence in order to develop the intelligent robots to work in efficiency manner. Robot plays a major role in space research and in surgery. In the future, the combination of human and robots with AI technology results in peaceful and effective world.

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The Building Blocks of Robotics

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1. Introduction

Robotics aims at designing intelligent machines that are capable of assisting human beings in day to day activities. It is an area of research that primarily involves the use of mechanical, electronics, and computer science. To understand the scope of robotics, here are a few examples:

1. The mechanical arms used in production lines for placing objects from one assembly line to another, packaging of goods, etc is an example of mechatronics i.e., use of electronic and mechanical engineering.
2. Softbot used in banking to open accounts of customers automatically without human interference is an example of a software robot.
3. The cleaning machine that can autonomously move around the house without any help and clean the dirt in the house taking care of obstacles and people is a robot that involves all-mechanical, electronic, and computer science.
4. Chatbot used to accept orders from customers for Pizza used by a leading Pizza company-designed to understand natural language is an example of a software robot.

Programming is always involved in designing an intelligent device. Electronics and mechanical branches are required to deploy the thinking process (robotics software) on a machine. There are essentially

five types of robots: mobile robots, stationary robots, autonomous robots (robots can think on its own), remote-controlled robots, and virtual robots (completely software programs with autonomous decision making).

2. Steps in Designing a Robot

The simple steps in designing a robot are:

- a) Identify the area for which robot is to be designed.
- b) Identify the inputs required and the type of sensors that can provide the input.
- c) Design the electrical connections between sensors and the motherboard (electronics).
- d) Write code for the motherboard to interpret the sensor input and take decisions accordingly.
- e) Motors (mechanical) to execute the decisions taken.

The above five steps summarize the robotics design.

3. Applications of robots

- a) Industrial Applications: This is one area where robotics is used extensively.
 - a. Automatic welding and painting
 - b. machine tending- shifting of raw material
 - c. laboratory applications- handling of hazardous material
 - d. robotics arm – shifting of semi-finished goods on the assembly line.

- b) Mobile robots: Robots designed for household cleaning as well as radioactive material.
- c) Toys for children
- d) Space missions make extensive use of robotics.
- e) Medical Science: surgical assistant for the doctors.
- f) Exploration robots in Antarctica and volcanic areas
- g) Music streaming Robots like Amazon Alexa
- h) Under-water robots for explorations in the deep sea (unmanned underwater vehicle- UUV)
- i) Military robots- telerobots are used to clear unexploded bombs and artillery shells.
- j) Robots in agriculture for weed control, cloud seeding, planting seeds, harvesting, environmental monitoring, and soil analysis.

4. Conclusions

Robots can do things that humans cannot do, hard tasks, and repetitive tasks. The robots can work 24X7. They have higher precision than human beings. However, the accuracy of the actions in a real-time environment is challenging to achieve. Robotics is an expensive field of study. The robotics branch is still in the research zone and some real applications with full power robots are a distant dream.

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ROBOTICS: Building Alternate Humans

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Robotics is a field of technology involved with the design, construction, operation, and use of machines that can substitute humans, called "Robots". These robots are used to replicate human actions and even do a better job than humans. Robotics works on the interface of Computer Science and Engineering, Information Engineering, Mechanical Engineering, Electronic Engineering, and others.

To know more about robotics, it is imperative to understand robots.



Robots:

A robot is a machine, programmed to accomplish desired activities automatically. They are programmed by a computer and are controlled using internal and external control devices. Designed for many purposes, both specific and general, robots are also used to perform actions that are dangerous for humans. The most noticed application of robots is for manufacturing purposes. But in this day and age, they are used for anything and everything. Everything that a human can do, a robot can do faster and better. Some experts even predict an "AI takeover", a scenario in which artificial intelligence becomes the dominant form of intelligence on Earth, with robots effectively taking the control of the planet away from the human species!



Fig: The robot "WALL-E", protagonist of the movie WALL-E

started working in 1961. This was the first digitally operated and programmable robot.

The descriptions of automata and machines go way back before that, even before the first century A.D. The first mentions of automata and machines can be traced back to ancient and early medieval Greek and Roman Scriptures, where simple automation was used as tools, toys, clocks and even for religious ceremonies. In the Victorian age, the Industrial Revolution brought about a drastic change in the usage of machines for manufacturing engines. Charles Babbage laid out the development of Computers during this period by devising the Difference Engine/Analytical Engine. And the development of these lightly automated machines formed the foundation for the full-fledged robots that are used today.

Applications :

Robots are designed for both specific



Fig : Devol with "Unimate", the first robotic device

and general purposes. Some of its application areas are,

Industries:

Industrial Robots are extensively used in manufacturing processes, like assembly robots, welding robots, and others, which help in the management of heavy-duty functions. This in turn helps in the increased production and sales of products.

Medicine:

Medical Robots assist medical practitioners predominantly in surgical processes. But they are also used for pharmacy automation, artificial companionship aiding the recovery of patients, telepresence to create a virtual presence of medical practitioners in remote locations, and disinfecting hospital rooms.



Fig: Robot-aided surgery

Agriculture:

Agricultural Robots, for the most part, are used in the seeding and harvesting processes. To increase benefits, robots are also used in weed control, environmental monitoring, and soil analysis. Growth in yields helps boost the national economy of countries, where agriculture is the backbone of the economy.

Education:

Robotics and simulations also largely impact the way students learn and understand academic concepts, hence, creating more knowledgeable students.

Furthermore, Robots are used in domestic, entertainment, military, and sports disciplines.

Future :

The revolutionizing invention of robots

is both boon and bane.

Robotics is not just going to transform our lives but is going to expand it and broaden our horizons. While robots take care of mundane chores in our lives, humans can focus on more creative, skill-based tasks which will help in the development of society as a whole.

Though robots serve great assistance in all spheres of life, we must not forget that most of the global poverty rises due to unemployment. The perfect blend of latest technologies like AI, ML, IoT, with robotics will undeniably take on a large number of jobs currently being manoeuvred by capable humans. And this abets this sink in the economy. A report from Oxford Economics estimates that, by 2030, about 20 million manufacturing jobs will be displaced due to automation.

But, with a proportionate combination of automation and human power, unemployment and other economic problems related to it can be tackled.



The future of robotics in India appears to be bright and promising as it is entering the industrial space with the advancement of science and technology. Robotic technologies are immensely used across a wide range of sectors, which promises to revolutionize the industrial scenario in India by applying automation.

Environmental Impact of Robotics:

Environmental scientists, engineers, and researchers are exploring new ways to integrate robotics into ecosystems to aid environment restoration. Robots help in controlling and treating climate change by monitoring pollution. Though the production process of robots causes some industrial inconveniences, they can very well be covered with the environmental benefits that

they contribute.

Some robots plant trees and help farmers survive droughts by analyzing data using AI sensors and monitors. Robots also help in analyzing the health of our planet by collecting samples from places that are out of human reach. They are also used in harvesting wave and solar energy on the ocean surface. There are robots that clean, dispose, and recycle waste.



Fig: Waste disposal robots are programmed to differentiate between the types of waste and how they must be disposed of.

All in all, robots use less energy, produce less waste, and give great results.

Robotic technologies award the world with many favorable ways to fulfill a variety of jobs. The robotics industry has evolved significantly since its birth and still has a long way to go. From the deep oceans to the high skies, robotics has become a part of all areas of life. The present feels blessed with this revolution and the future of this field is bright and shiny.



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Prof. (Dr.) S S Agrawal
Chief Editor

**Themes for CSI Communications**

Month & Year	Theme	Month & Year	Theme
November, 2020	Deep Learning	December, 2020	Industry 4.0

Robotics as a learning tutor and its aid in education

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"Robots are machines that provides some form of autonomy to assist it's user in performing certain task and Robotics is study of robots i.e. it involves design, construction, operation and its application while teaching all of these it is termed as educational robotics."

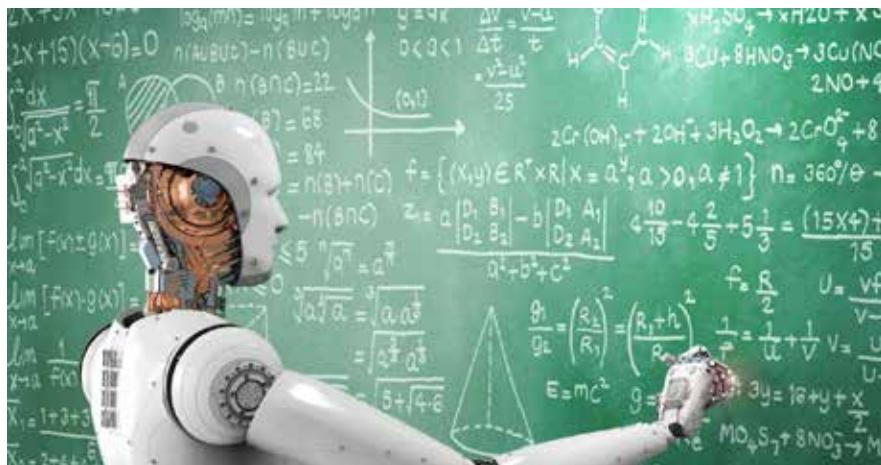


Fig. 1 : Robot teaching

Technology has become an integral part of the world and is growing at an exponential rate imagine the most basic technology like smart phone or the internet, People lived without it but can you? Likewise we have done our education without robotics or robot in our schooling but it may change anytime soon because the trend to teach and use robotics in education has started and there is no way one can image how exactly the thing might grow so, let's get started on how it is currently used and how it might be in the future.

A brief history of robotics

The concept of artificial humans has its origin from ancient times .History of robotics is the combination of history of science, technology and progress. The technologies such as electronics, computer, pneumatics (filled with air) and hydraulics can all be measured as a different part of the robotics history.

The word " robot " was coined by Karel capek's play Rossum's Universal Robots (R.U.R) in 1921 robot is Czech word for slave or forced labor, later the word " Robotics " was coined by yet another writer Isaac asimov in his science fiction short story *Runaround* in 1941 he didn't realize that he was coining

the term as he assumed robotics already referred to the science and technology of robot as how electronics referred to science and technology of electrical devices. He is also the one why wrote the famous 3 laws of robotics.

Unimate invented by George Devol was first ever digitally operated and programmable modern industrial robot created in 1950 and it was later granted in 1961 where as the first educational robot Leachim was invented by Michael J.Freeman in 1974 and was tested on a 4th grade classroom. Leachim was capable to synthesize human speech using Diphone synthesis.

Review

Even though I want to talk more about robotics our main purpose here is to discuss more on educational benefits of robotics but to somethings are inevitable. Today advance robots are popping up everywhere it is all thanks to the 3 main technologies namely sensors, actuators / soft robotics and AI (artificial intelligence). The robots can be



Fig. 2: history of robotics

roughly classified into different types as to which sector they are used in and the nature of their environment they work under as given below Fig. 3.a and Fig. 3.b

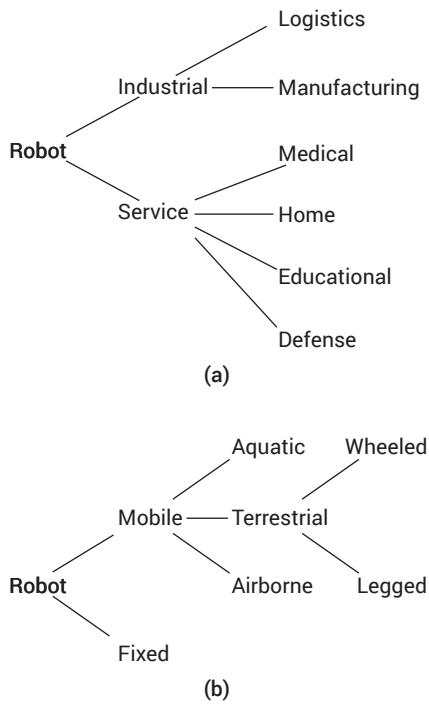


Fig. 3: classification of robots

How can robotics help in education -

- Fun for students
- Helps child with special needs
- Simplifies complex tasks
- It personalizes to each individual
- Teacher can monitor each individual and can develop their performance
- Develop skill for future

Robot role in education

Robots more specifically social robots can have varied roles it is known to be a teacher for many but it can also be a peer learner (student) for building friendly relationship and can also be as a novice that swaps the role of instructor and student.

Robots as teacher / tutor -

They also include teaching assistant as robot that provide course content through a tutorial and supervise in the class monitoring the fellow students most of these are done in a controlled experiment and observation are made on impact of these robots on the young minds (learners) there were both 1-to-1 interaction for personalized education but sometimes it also uses a novel channel

through which the lecture was delivered to entire class.

RUBI-4

(Toddlers vocabulary improving robot) – RUBI 4 is a sociable robot which is fully autonomous at a low cost compared to other robots it was used to study whether it can improve vocabulary skill of toddlers who were 18 – 24 months of age. The setup to study was made in early childhood education center for over 2 weeks, during the intervention period the robot taught the toddlers (target) words for which materials were selected from the MacArthur-bates communicative development inventory 20 words were selected based on frequency of use and semantic similarity. The results showed a 27% improvement (with almost 25% less error rate) in knowledge of the target words taught by RUBI it had a significant effect on the vocabulary improvement of the toddlers.



Fig. 4: RUBI-4 during early prototyping.

Robot as a peer learner – robot as classmate i.e. peer companions for the students make it more comfortable for the students, as a result the student might interact more with the robot this in turn improves 'Human Robot Interactions' HRI. Robovie was also one of fully autonomous robot introduced at elementary school. It was an English speaking robot designed to improve English language and it was introduced as a more knowledgeable peer to the student which guides the other classmate.

Robot as novice – when student swap the role as an instructor to teach the robot such kind of robots are called teachable robots and is another successful way of introducing robots into education. Typically it means that student is learning by teaching (the protégé effect). In fact it builds the confidence in kids considered

to self learning. It can be used to improve vocabulary as well as motor skills (hand writing) while teaching students reflect on their own mistakes by deepening their thought process. This suggests that while teaching a novice robot there is more chance that the kids will develop the meta-cognitive skills because the learners who commits to instruct must have high understanding of that material. The '*'care-receiving robot'* CRR is first teachable robot.

Robotics in education can be introduced in two ways

- i. Developing advance robots
- ii. Introducing robotics to strengthen STEM disciplines

i) Developing advance robots - As *kendra roberts* an educational expert from Essays. SchloarAdvisor explains "A single teacher does not have the capacity to meet the needs of the personalized learning for every single students in the classroom. Computer based learning is already changing things in that matter. It's not replacing the teacher, but it enables students to learn at their own pace." There is a need for social robot to engage in more effective and interactive classes.

Many top robotics companies have been formed such as CANVAS, Boston Dynamics, Agility etc, and as for educational purpose companies such has soft-bank, Lego mind storms, NTX robotics, Hanson robotics, Irobot etc, have been developing new advanced robot to aid students as well as teachers in educating the young minds

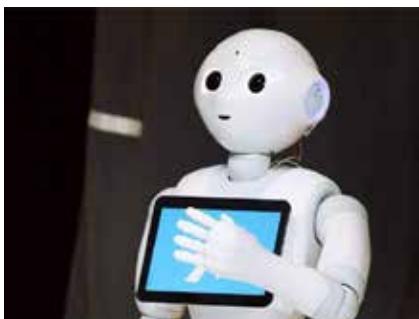
Softbank Robots –

NAO - is the most widely used robot around the world and has set standard in the educational institutes it has speech recognition and dialogue availability in 20 languages and is a very good programming tool NAO has 25 degree of freedom to adapt to its environment and is 58 cm in height.

Pepper – is the first humanoid social robot that can perceive its environment and can enter into a conversation when he recognizes a person. He can read human emotions to a certain extent by recognizing their faces he was optimized for Human Robot Interaction (HRI) he has speech recognition and dialogue availability in 15 languages. The touch screen on his chest displays messages and also provides as an interface (UI). Pepper has 20 degree of freedom and is 120 cm tall.



(a) NAO



(b) Pepper

Fig. 5

NAO and Pepper both of which are used as an assistant for teachers the NAO is most likely used for primary / secondary school children while Pepper for high school or college and even for research purposes. Other than that they customize teaching according to the student capabilities and both of them have the visual and intuitive interface which makes it easy for the content creation by higher level of abstraction like a drag and drop interface to programme easily other than using IDE to make it user friendly as much as possible. They are also completely programmable to user requirements and are humanoid in terms of look and actions along with tailored and flexible courses they promote the individual education Program (IEP). More than 17,000 NAO and Pepper have already been used across the world in many companies, hospitals and educational institutes.

An assistive technology to attend school - it can be said as a very helpful solution for those students who cannot attend school, maybe because of their particular physical conditions. Like children with severe allergies or students who are recovering at home after a major surgery. Robots can be used to bring into classroom all those students by going in their place. By using robot that attends school and brings the student along with him via a dedicated

internal video conferencing system and customized UI for children they can raise question or talk with friends. The Norwegian start up ,No Isolation created this robot and has been very useful.



Fig. 6 : No isolation's robot

Helps students with special needs - robotics can be programmed to suit each individual needs. Students with development issues or attention disorder can have constant companion to teach them to focus. Similarly children with autism (are visual learners i.e. they learn from visual media) " Autism Spectrum Disorder " ASD is a complex neuro development disorder who exhibits behavioral challenges with social skills, speech and nonverbal form of communication which affects them by making learning hard, they can be supported by robots to learn communication and social skills by interacting with special devices that adapt their answers and responds according to student's reactions.

ii) Introducing robotics to strengthen STEM disciplines - STEM "Science, Technology, Engineering, Mathematics" has been the fundamental skill needed to integrate to make it easy to work on real world / practical application.

Educational robotics strengthens student's skill and cognitive abilities as it develops their knowledge through creating, designing and assembling the robots. Children and young students find it enjoyable because they directly work with electrical and mechanical components of the robot. Introducing robotics as a part of curriculum can be more effective as they can relate to academic concepts they learn in classroom to the practical application and how such concepts work in real world. This kind of experience paves the way to develop scientific

temper among young minds.

Mainly it improves higher order skill such as

- ✓ Critical thinking
- ✓ Strategic planning
- ✓ Innovative
- ✓ Problem solving
- ✓ Analytical reasoning
- ✓ Design thinking
- ✓ Application oriented

These are just a few examples of abilities that can be developed using educational robotics along with these it also improves logical, analytical, communicational, team building skills with the fun filled hands on session in the school if you have read something you might remember it for quite sometimes but if you have worked on the something it stays longer. There is one book that enlightens you and ones hard work that make things into reality and one idea that is a game changer. All it requires is a piqued interest of the person doing it and one of the ways is by introducing robotics as a part of curriculum.

Developing skills for the future - preparing students for the competitive workforce as programming is one of the on demand jobs. By working on robots, students can discover their passion and interests to those skills that will define their jobs of the future in programming, science, technology and engineering through the integration and application of their knowledge.

Limitations

Robotics is a very suitable platform to train students in STEM disciplines however such implementation still requires fine tuning and quite a lot of research on these domains. All the robots which are developed are used only in the restricted environment. The most basic social interaction is difficult to automate although we have succeeded in the restricted context. The perception of the world is needed to act appropriately and educational robots react in terms of context used to teach so, it is still lacking but reading the social cues such as confusion, disinterest, active participation cannot be perceived easily by robots.

Most of the researchers have focused on personalizing interaction with users to accomplish this they use computational techniques such as dynamic Bayesian networks, fuzzy decision trees, hidden Markov models and reinforcement learning are used to tailor it according to user needs to overcome the limitations.



Fig. 7: future robot

Although speech recognition, computational vision and social signal processing has made great progress but it is still not sufficient to make fully autonomous robots. Personalization of task needs to be correlated to student age and mental development. Even most of human can't communicate what exactly they want other people to understand, perception and vision is been biased by both the social and cultural background as well as the language that is used for communication. Even if the robot is able to perceive thing as we discussed above it must act according to what benefits the educational program in the long run but, this is the most difficult task since even human expert in any field cannot predetermine the course of action he must take to benefit the most for students. Verbal and adaptive content progression has already been difficult but robots must also have nonverbal communication to make it feel more natural thus integration of all these technologies and balancing their social behavior is still a big challenge ahead of us.

Future of robotics



Fig. 8: Michelangelo reference in human and robot

We all believe that there is a celestial being named GOD who is the creator of the universe. And his greatest gift to the mankind is consciousness. Robots don't have it yet but it might be possible. By the time we create a robot with consciousness then we are also creating another race called robots.

Robots are getting smarter day by day but we may have to babysit the robots since they still have difficulties in facing the real

world. Human Robot Interaction –HRI is the new field that deals with the relationship between the humans and robot. It is said that robot can get along with humans more easily but to train human to get along with robots is a major issue. Robotics education is not limited to school and college even robot can be used to pilot a spacecraft and educate about what is learnt from outer space using advanced sensor.

Why do we have Robophobia ?

Surprisingly there is a fear in many humans that advancement in robotics may create a singularity which can throwing humanity to be captured by the robots one day, maybe this was caused more by the Hollywood or the fear that the job security will be no more like how it is now. But robotics have been of great help and continues being so but real thing to fear is that what if we human become way too dependable on the robot that we can't lead or imagine life without it then we would be the slave instead of robot. It might become a fundamental right that everyone must have robot funny to hear it now but still it's uncertain and nowadays we can already witness the effect that entertainment industry or social media has on people.

Robotics in itself can't be the threat to the human but when combined with the AI (brain) that is what we not so sure about because Humans fear most what they don't understand and envy things there are not capable of this, inferiority complex maybe another reason for robophobia since robots can literally be have super human abilities most importantly they are immortals since they can just transfer their conscious to another body and also are not affected by harsh environment like humans. Since they have their own mind they can think make decision on their own later if they have gratitude towards humans everything will go accordingly but when they despise humans as weak creator or doesn't want to do the master-slave relation anymore then the human apocalypse begins.

Maybe we are thinking way too much robot cannot break law or rule since they are born / created with it, only human don't have rule book that we should follow and we don't have limitation of any sort all capabilities depends upon our self. Since we have seven deadly sins are we expecting robot to develop too? They may seem advance but are far from autonomous wonder one might

think of.

Conclusion

"A man's mind, stretched by new ideas, may never return to its original dimensions" -oliver wendell holmes Jr. Robotics is an effective management tool for teachers as well as a strong motivational tool for the students and teachers can revise their pedagogical approaches of teaching not only in abstract subject but also in literature topics. Robotics in education has been growing and continue to grow at a fast pace in this era whether it is used in educational institutes to train children effectively through individual personalization or to assist teacher's to manage efficiently. Having robotics is definitely more to gain as humans and robots are destined to work alongside for better future. Cost of robotics also reduces as technology advances all we can do now is either contribute to this robot society that is being created or wait till that day comes.

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Artificial Intelligence and Robotics: A Research Overview

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Artificial Intelligence (AI) and Robotics are advanced innovations that will have huge effect on the improvement of mankind sooner rather than later. The thought of "artificial intelligence is seen extensively as any sort of artificial computational framework that shows insightful conduct, i.e., complex conduct that is helpful for arriving at objectives". Minsky had recommended that we don't wish to limit "intelligence" to what exactly would require knowledge whether done by people. This implies we join a scope of machines, incorporating those in "specialized AI that show just restricted capacities in learning or thinking however exceed expectations at the robotization of specific errands, just as machines general AI that plan to make a for the most part wise operator". Robots are the counterfeit specialists acting in certifiable condition. Robotics is a "part of AI, which is made out of Electrical Engineering, Mechanical Engineering, and Computer Science for planning, development, and use of robots".

1. Introduction

Robotics is a field of building that manages plan and use of robots and the utilization of PC for their control and preparing. Robots are utilized in businesses for accelerating the assembling cycle. The morals of AI and Robotics are frequently centered on "worries" of different sorts, which is a common reaction to new advances.

1.1 Aspects of Robotics

- "The robots have mechanical development, structure, or shape intended to achieve a specific errand
- They have electrical parts which force and control the hardware".

1.2 How do Robots and Artificial Intelligence cooperate?

Man-made brainpower or AI gives robots a PC vision to explore, detect and compute their response likewise. Robots figure out how to play out their undertakings from people through AI which again a piece of PC programming and AI is.

Since the time John McCarthy has instituted the term Artificial Intelligence in 1956, it has made a great deal of sensation. This is on the grounds that AI has the ability to offer life to robots and engage them to take their choices all alone. Contingent upon

the utilization and the assignments that the robot needs to perform various sorts of AI is utilized.

1.3 Difference in AI program and Robot System

AI Programs	Robots
They usually operate in computer stimulated worlds.	They operate in real physical world
The input to an AI Program is in symbol and rules	Input to robots are analog signal in the form of speech wave form or images.
They need general purpose computers to operate on.	They need special hardware with sensors and effectors..

2. Human-Robot Interaction

Human-Robot Interaction (HRI) is a "field of study dedicated to getting, arranging, and evaluating mechanical systems for use by or with individuals". Association, by definition, requires correspondence among robots and individuals. Correspondence between a "human and a robot may take a couple of structures, anyway these structures are generally affected by whether the human and the robot are in proximity to each other or not". Henceforth, correspondence and, as needs be, correspondence can be confined into two general characterizations:

- (i) Remote communication: "The human and the robot are not co-found and are

isolated spatially or even transiently (for instance, the Mars Rovers are isolated from earth both in existence").

- (ii) Proximate connections: "The people and the robots are co-situated (for instance, administration robots might be in similar room as people)".

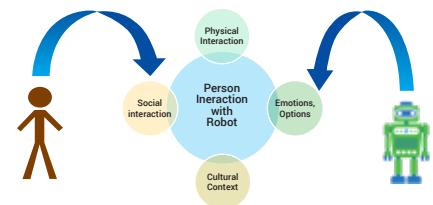


Fig. 1: Human-Computer Interaction

3. Autonomous Systems

Autonomous systems include operators and items facilitated in some regular condition so their aggregate conduct meets a lot of worldwide objectives. The idea of self-rule is vital to the IoT vision promising expanding joining of savvy administrations and frameworks to accomplish worldwide objectives, for example, ideal asset the board and improved personal satisfaction, with negligible human intercession.

3.1 Intelligent Agent

An Intelligent Agent is "viewed as a

product element situated in an environment". IA can be: "Autonomous, respond to changes in nature (environment), be proactive in accomplishing its objectives; and furthermore and Sociable".

IA is appeared in the Fig. 2. To accomplish the objective, an IA learns without anyone else and utilizes its inside information base. Accordingly it is viewed as characteristic allegory for human acts. It has a raised presentation conduct in information circulation and control of willful skill.

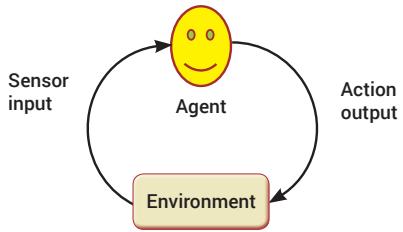


Fig. 2: Basic Agent

3.2 Attributes of Intelligent Agents

The three attributes: "agency, intelligence and mobility" are utilized in canny operator frameworks, to quantify framework properties. Figure 2 delineates the connection among agency and intelligence:

- **Agency** - The degree and degree to which freedom is shown by a specialist.

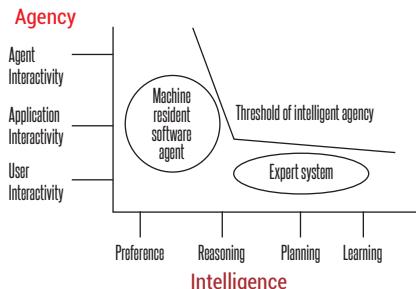


Fig. 3: Intelligent agent Scope

- **Intelligence**- The capacity of a specialist to acclimatize and conform to a space, by methods for client demands and

accessible advantages for the operator. Systems above "the threshold lines are recognized as intelligent agents as shown in Figure 3".

3.3 Artificial Moral Agents

An Artificial Moral Agents (AMA) is a virtual agent (programming) or physical agent (robot) fit for taking part in moral conduct or possibly of maintaining a strategic distance from corrupt conduct. This ethical conduct might be founded on moral hypotheses, for example, teleological morals, deontology, and righteousness morals, however not really.

4. Conclusion

Robotics and artificial intelligence fill totally different needs. Robotics and artificial intelligence are truly two separate things. Robotics includes building robots though AI includes programming insight.

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Prof. A. K. Nayak
Publisher



A Study on Social Impact of Robots in Human Life

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"If robots are to clean our homes, they'll have to do it better than a person"

James Dyson

1. Introduction

In recent years, computers and the internet's mushrooming capacity, accessibility, and ubiquity have outstripped early predictions about the pace of advancement and usefulness of technology in everyday life. Alert pundits now predict a planet filled with powerful computer chips, trying to insinuate themselves progressively into our phones, homes, clothing and even our ourselves. But a closely linked target has stubbornly remained elusive. In sharp contrast to the relatively unexpected proliferation of computers into the mainstream, the entire robotics movement has struggled to live up to the 1950s predictions quite fully. In those days, experts who were blinded by the apparently incredible computation ability of computers thought that computers could become the artificial brains of sophisticated autonomous robots if only the right software was written in. They claimed that, within a decade or two, such robots would clean our doors, mow our lawns and, in general, remove drudgery from our lives. Obviously, that's not the way it worked out. It is true that industrial robots, among other things, have changed car manufacturing. But such automation is a long cry from the portable, mobile, autonomous developments that were hoped for by so many scientists and engineers. Hundreds of researchers have grown disheartened in the creation of such robots and thousands of start-up firms have gone out of business. It is not the mechanical "assembly" that is unachievable; as the industrial robots testify, articulated arms and other moving devices already exist adequate for manual work. Instead, it is the artificial brain based on a device that is still far below the degree of complexity

required to construct a human-like robot [5]. By 2040, it is assumed that we will certainly achieve the original objective of robotics and a thematic pillar of science action: a freely operating computer with a human being's intellectual ability.

2. ROBOTS: From Threat of Cold war to Future Savior.

A "robot" is often described in terms of its capabilities – it's a machine that can automatically perform a complex series of actions, particularly one that can be programmed by a computer. This is a useful description which includes a large proportion of the kind of traditional robots you see in science fiction films. This description, and the weight of existing cultural conceptions of what a robot is, affects our perceptions of what a robot could be. By analyzing cultural attitudes to robots around the world, one can see the strongest evidence of that. When we type the term "robot" into the Google search engine's English language edition, we obtain photos that are almost entirely humanoid, shiny, rigid in form and almost clinical. They also have some robots of a very dark and aggressive-looking kind of the military. If we type the same word on the Japanese language Google site then some different set of results are obtained. The cause of this disparity is ancient, and in the Cold War, due to the post-war cultural entanglement of new technology, and particularly robotics. Robots were symbols of an alien menace. In comparison, Japan did not suffer from these biases and therefore robots were seen as benevolent entities. The effect of these historical and cultural disparities in the creation of robotics is profound: Western

robotics is heavily involved in military research while Eastern robotics is based on assistance, health care, and industry. It also perpetuates our skewed expectations on what a robot should look like and how it should behave. We now have a chance to break free from those conventions. A robot doesn't need to be humanoid, have arms, move or speak. We may have a much broader understanding of what a robot is, instead. There is a blurring of distinctions between smart devices, artificial intelligence, embodiment, biology and robotics [4]. This is how robots in the next twenty to forty years will really impact the human race. The social robots have a huge impact in the lives of the older people especially the people who live alone [1]. The social robots can act as their companion and can also be programmed to share and understand the feelings or emotions of the humans. With the help of robotics, the opportunity for problem solving and collaboration can be achieved. The focus should be to build a secure and safe robot keeping in mind the human-centric environment and ways should be worked upon as to how the social robot can be optimized to perform the physical tasks along with the ways to work with humans in an enjoyable and reliable way [2].

3. Impacts of Robots in Everyday Life:

The following section describes the impact of robots in daily life [7]:

- i. **Automated Transportation (Self-driving Robot):** The foremost use of mobile robots is observed in Driving Cars that are Autonomous and self-driven. The advancement in the

self-driven vehicles have increased drastically since last 10 to 15 years. The automobiles presently without robotics are like computers having wheels [3]. The Automobiles with robotics are comparatively are risk-free and efficient. Self-driving robots are not the one which drive cars. In fact, this are the cars that are built like robots with artificial intelligence deployed in it. This type of autonomous and self-driving cars, trains and buses are available in numerous countries like Europe and America. These vehicles are rarely seen running on road. Companies and Organizations like Audi, Google and Mercedes, are announcing self-driving cars. Humans will be replaced by robots to drive vehicles autonomously in the near future. Eventually, this will reduce the occurrence of accidents.

ii. Security, Defense, and Surveillance: It is very normal for robots to do the job of a security and surveillance. Robots does the survey of some specific areas only and notifies the owner about any disturbances happened. This feature of robot is used in the application of military as well as in the day to day life. In military, this type of robots is used for various jobs. Bombs are armed and disarmed using these robots. These robots help in monitoring home when people are away from residence in their day-to-day life. They monitor ground, the skies as well as water remotely. This type of robots can easily be controlled and can be sent to different locations for monitoring purpose. Hence, home and other valuables can be protected from getting harmed.

iii. Robots Cooking: It becomes a tedious task for professionals to prepare various food items and delicious meals after a hectic day schedule. As a result, humans try to prepare meals in shortcut way which results into unhealthy and less tasty food. As a solution of this, robots can be developed which are capable of cooking as per the assistance. Programmable robots are capable of cooking the food of our choice. The ingredient quantity needs to be set and rest of the procedure is done by the robots. There are many robots which can easily copy the actions of humans and act same

like them. Human body movement is recorded via the camera, from where the robots copy human actions and cook accordingly. The recordings help robots to cook in the manner human does. Many hotels and houses have this type of robots for cooking. Some companies like Moley Robotics and Shadow Robot manufacture this kind of robots.

iv. Medicine: Robotics has an irrefutable impact in medicine field. Engineers have succeeded in discovering surgical robots. Till now, robots were utilized as assistants for clinical systems. It may happen that robots replace surgeons in the near future. Robotic systems are developed in numerous clinics all around the world. As robots are having capabilities to perform the given task precisely and accurately, so the engineers are giving their best to invent micro and nano robots.

v. Education: Diseases are present in numerous students worldwide. This becomes the main reason of their absenteeism in classes. Robotics work here effectively. Engineers have developed such a kind of robot which work as a person in classroom. Such robots' eyes act like a camera and the body interacts with fellow students and teachers. It is difficult and irritating for autistic students to communicate with other people. The humanoid robots are developed for this kind of students because this type of robots look like human beings which makes it easy for them to interact with other people. Science and Technology has made distant learning possible. In the present times, teachers can teach virtually using telepresence robots who act like human and can even be controlled from distant places.

vi. Home Maintenance: Robots are now always available for an individual for fulfilling their personal requirements. Robots are capable now in helping in household activities. Examples of few activities done by home maintaining robots are:

- Looking after pet animals in humans' absence at home.
- Monitoring humans' day-to-day life activities. In this manner, robots get ready for personal use.

- Laundry, cooking food and cleaning home.

vii. Doing Dangerous Jobs: Robots have replaced humans in performing dangerous activities such as:

- Robotic welding, as human welding is dangerous and produces much sound.
- Oil companies examine the pipelines with the help of pipe-inspecting robots because it is dangerous for humans to inspect pipes having toxic gases.
- Cleaning in nuclear plants having harmful and nuke wastage material.
- Firefighter robots.
- Robots are being utilized as a sewer scraper.

viii. As a servant and Friend: Robotic engineers work as a servant and friend.

- Cooker robots prepare meals.
- Laundry robots make ready clothes.
- Surveillance robots monitors home in humans' absence.
- Robots look after pets.
- Artificial intelligent robots are clever to act as friends.

4. Pros and Cons of Robotics:

As companies look to take advantage of the many advantages it provides, the increasing popularity of robotic automation across a wide range of sectors looks set to continue over the coming few years.

Not everyone would agree to the benefits that robotic automation and chances of valid objections can be raised. To address both the sides of discussion, hereby is the description of both pros and cons of robotic automation:

Pros:

1. Cost Effectiveness [8]: Various holidays, leaves and tea breaks dedicated to robotic automation would not be enabled. It can be set to function on a repetitive loop, and unless programmed otherwise, it will continue to do so as long as it is managed correctly.

2. Quality Assurance enhanced: Robotic automation removes the risk of business mistakes and serious injuries which can be seen during the manufacturing and testing products. With more products coming out of the door to a higher quality, this gives

companies a variety of new business opportunities to expand on.

3. **Work in Hazardous Environments [8]:** In addition to possible occupational accidents, staff members may be expected to work in unsafe or hazardous conditions in unique industries. Due to the nature of the job, manufacturing areas may have high turnover of workers. Automated robots will reduce the waste of materials and eliminate the unnecessary risk.

Cons:

1. **Job Losses [8]:** The effect of employment is one of the key issues of robotic automation. If a robot can operate at a quicker, more reliable pace, then the fear is that there would be no need for humans at all. While these questions are comprehensible, they are not very specific.
2. **Initial cost of investment:** Typically, this is the biggest hurdle that will decide whether or not an organization is investing in robotic automation. The cash flow needs to be sustainable. In most cases, however, there will be a refund schedule available, which makes it much easier to afford and monitor finance.
3. **Hiring trained workers:** Implementing automation adds another dimension to this problem, because robots need to programme and know how to operate them. In practice, this would open up the opportunity to train the current employee and extend the skill set. The automation company will start installation and workers will learn to run the robots in the long term with the right skills.
5. **Robo and Human: Evolution of a New Species:**
Globally, scientists and engineers engage in a high-stakes competition to build the first intellectual robot. A lot of robots still exist – car factories are full of them. Yet, the next generation of robotics will be something else: smart machines that function much more like living beings. What will happen then? We are beginning to imitate our machines with our prosthetic arms, artificial eyes, and titanium hips. And as we inject chips into our bodies to connect directly to computers, the resemblance will only become more pronounced. Science fiction is going to become a fact of science.

Meanwhile, our machines are beginning to mimic us – and that is equally important. Robotic mice, crabs, geckos, and dogs are now streaming in from the laboratories. Re-creating and going beyond Homo sapiens itself is the next step. Robots are now able to walk, speak, and dance; they can respond to human facial expressions and obey verbal instructions. Are they going to be our allies or our rivals, as scientists continue to build fully autonomous robots with greater intelligence than human beings? Is it just going to be a robotic revolution or an actual evolutionary extension? Can robots and humans converge into one species – the Robo sapiens? Robo sapiens are a hybrid human and robot species much superior in intelligence to that of biological humans alone; they will appear in the 21st century. There are so many roles to be replaced by machines using Artificial Intelligence, but there are so many things that machines cannot do. One of the soft human qualities that AI may not have is logical thought. While technology has advanced to the point that it can perform tasks with great speed and precision, rational thinking is still far from being employable. AI is still taught to perform repetitive tasks, but it cannot make decisions when faced with eventualities that go beyond what it has learnt. For example, a human could improvise or follow gut instinct, but a computer can't. AI has evolved enough in recent years to be able to produce creative works, including sculpture, music, and even written objects. The minds of humans are imaginative. However, the uniquely human touch is what these works lack. Without knowledge and consciousness in imitation of input, AI can only construct creative works, and it does so. Nevertheless, nothing is equivalent to an original, innovative, connected artistic work capable of capturing and depicting human emotion and condition. This is why, such as those in publishing, music, visual and performing arts, and even engineering and marketing, occupations that require creativity are less likely to be replaced. The programmer speeds up the rendering process and streamlines it, but it doesn't make stylistic decisions like the artist does. This is why robots or computers are unlikely to be replaced anytime soon by inventors, thought leaders, entrepreneurs, poets, artists, and visionaries.

6. **Future Forecasts for the Robotics [6]:**
 - a) **Artificial Intelligence will come up**

against Regulation: The idea of battling smarter robots than their creators have been the plotline of hundreds of films portraying the human race's demise. Elon Musk has previously added fuel to the fire by claiming that artificial intelligence (AI) is our "greatest existential threat" and even comparing AI research to evading demons. Other prominent figures like Stephen Hawking and Steve Wozniak have recently echoed these fears, further raising doubts about how much robots pose as a threat to humanity. Calls for AI control were so widespread that in 2009 the Association for the Advancement of Artificial Intelligence (AAAI) held a conference devoted entirely to the issue of whether robots could ever attain disturbing freedom standards. Mustafa Suleyman, Google DeepMind's head of Applied AI, recently brushed aside the concept of rogue robots aiming to destroy the human race while speaking at a machine learning event in London. Suleyman continued to emphasize that fear of AI inevitably takes attention away from his efforts to solve some of the world's greatest problems, such as global warming and food security. AI will continue to face criticism from those worried about computers being smarter than their inventors, despite its potential for improving society. Expect the fight for AI regulation to rage on for the next five years, and begin the introduction of government or industry standards.

- b) **Designers will keep pace from Humanoid Robots:** If humanoid robots are supposed to serve more social roles that placed them in daily human interaction, something needs to be done to counteract the uncanny effect of the valley. What makes both robots special is their animated eyes, which are sensitive to motion. The lack of human attributes helps prevent the uncanny valley effect from happening, while the cartoon eyes encourage communication with human workers.
- c) **Drones will be widely adopted:** Drones have been a subject of much discussion in recent months, as questions have arisen regarding protection, performance and regulation. Amid this, there are a variety of creative

ways customers and companies continue to use unmanned drones. The growing use of drone technology isn't without controversy. Although local authorities say the drone isn't illegal, FAA regulators argue that they have laws that specifically forbid the installation of weapons on civilian aircraft. However, such rules didn't stop customers from playing with firearms.

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Viewing the Covid-19 and Lockdown situation in the country, the ExecCom of CSI has decided to give **15% DISCOUNT** in new enrollment of Life Membership of CSI till 31st December, 2020.

Dr. Vipin Tyagi
Hon. Secretary, C

Cognitive Robotics: Research Questions

► Snehasis Banerjee

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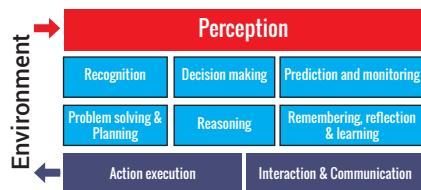


Fig 1. Generic Modules of Cognitive Robotics

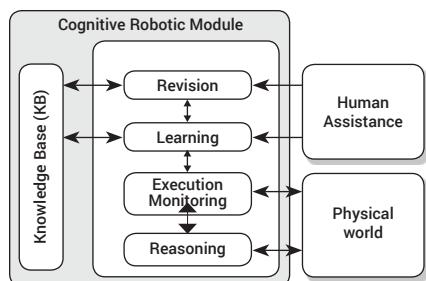


Fig 2. A Typical Cognitive Robotics System [2]

Cognitive Robotics [1] as a field is to endow robots with high-level cognitive capabilities to enable the achievement of complex goals in complex environments using limited computational resources. Naively, the objective is to create 'Thinking Robots'. Today's robots can do well-defined tasks, however none has mastered human's ability to multitask or use common sense.

In recent times, AI's might has been proven in video games as a virtual world is always a better test ground due to safety and controlled nature of interactions. But, AI's true potential can be realized only in the field of cognitive robotics where robots can be tested for the true test of intelligence - survival and adaptation in real dynamic scenarios. As shown in Fig. 1, the topic deals with adaptive interaction of an agent with the environment. An agent in computer science is an autonomous entity, in this case

- a robot. Similar to the biological immune system, it is expected that such an agent will be self adaptive and self repairing. A cognition enabled robot is expected to sense the environment (world), understand the world state and using its action model, actuate (move). However, due to the nature of the topic involving various computing sub fields, progress has been limited. Enlisted are the research challenges in this field:

➤ **High-Level Perception and Action**

- most of the recent AI work has focused only on the perception angle like computer vision based image / scene processing. However, the main challenge lies in understanding the scene by combining with priors and generating a richer multi-modal perception. Say, can a current scene's objects' causality, association and relations be understood? Given a Task, what high level actions should be taken (broken to atomic actions) by a robot to mimic a human's decision making in such a context?

➤ **Attention**

Irrespective of the different distractions in the physical world, humans can concentrate and give attention to a specific task at a time. How can robots simulate such attention mechanisms to fulfil complex tasks by neglecting noise and irrelevance?

➤ **Memory Management**

Humans have genetic memory as well as learned memory (through experience or dreams). Usually they are short-term like remembering SMS OTP and long-term like mathematical operators. How can the same be simulated in a robot so that robot can use memory allocations optimally?

➤ **Learning**

The human brain is a learning machine. Sensing the environment to learn new scenarios and feedback of success / failure of actions help the robot learn. However, how can a robot learn experiences from priors,

other robots and humans? How can it mimic others as well as share its learning?

➤ **Knowledge Representation**

Humans can gather knowledge by searching web, interacting with other entities (teachers) and studying culture (say books). What knowledge representation should a cognitive robot use that will be easy to maintain, search and look up is an open and challenging problem.

➤ **Concept Formation**

Humans when thinking do not deal with alphabets or words or sentences. Their thought process roams around concepts. How can a robot learn as well as store concepts and sub-concepts of the world and its interactions is an unsolved challenge yet. For example, how can a robot know when it is 'safe' and when is it OK to actuate?

➤ **Reasoning and Problem Solving**

If a procedural solution is not provided, it is very difficult for a robot to find a solution to a problem on its own by using common sense, reasoning and constraint solvers. How can a robot solve a new problem on its own? AI planning using PDDL techniques may help in this regard. However, they still lack the automation step and seamless adaptation.

➤ **Adaptation across domains.**

Since robots (specially service robots) will co-occupy human spaces apart from virtual interactions, it is important for Human-Robot Interaction to leverage existing human modes of conversation along with gestures. Can robots socially interact with children and elderly population with natural empathy?

➤ **Theory of Mind**

Cognitive Robotics as a discipline is highly influenced by philosophy of mind, cognitive science and neuroscience. In popular philosophy, there is a concept of mind and body. In this case, the robot's external environment is its world; its own

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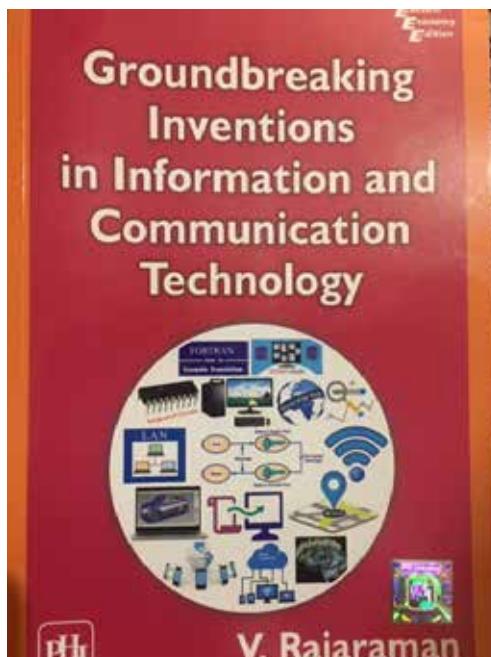
BOOK REVIEW

Groundbreaking Inventions in Information and Communication Technologies

By V Rajaraman. PHI Learning Pvt. Ltd., Delhi, 2020, p 178.

The above mentioned book by V Rajaraman gives an interesting reading. Prof. Rajaraman divides this book into four major chapters: 1. Introduction. This chapter details what is being discussed in Chapters 2, 3 and 4 and also a chronological list of inventions in ICT. In Chapter 2, the first four inventions are discussed elaborately. Chapter 3 deals with the next five inventions. In Chapter 4 the last six inventions are mentioned. An attractive and innovative feature of this book is that it gives the images of the inventors (legends) along with their contributions. This will certainly have an imprint specially on the young minds.

The first chapter gives an outline of the inventions from 1957-2011. The second Chapter deals the developments that took place between 1957 -1974. These include, FORTRAN, Integrated Circuits, RDBMS and LAN. The driving force behind the development of COBOL was also discussed here. The third chapter deals with developments that took place between 1975-1984. It includes modern topics such as Personal Computers, Public Key Cryptography, Computer Graphics, the Internet and GPS. The fourth Chapter deals with the inventions



between 1984-2011 and includes a discussion on WWW, Search Engines, Digitisation and Compression, Mobile Computing, Cloud Computing and Deep Learning. Developments leading to topics such as Data Analytics were not covered and one hopes that they will find a place in future editions.

The book gives an easy reading and one feels that he/she is just reading a scientific novel with no strain on the mind. Prof. Rajaraman deserves compliments for bringing out such a nice book. However, with all the plus points, we would like to mention that the cost of the book (₹ 495/-) appears to be a little on the higher side. We are sure that many students and young professionals would like to have personal copies of this book. Certainly this book deserves to be placed on the racks of not only of technical and academic institutions but also on the racks of State Libraries.

– Prof. D. D. Sarma, Hyderabad, and Prof. A. K. Nayak, Patna

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mechanical hardware along with artifacts resemble the body; a portion of software with its cognitive decision making forms the mind. The latter can be distributed as well across robots; or reside locally or in the cloud, based on design principles. The fundamental question is: can robots simulate the human mind where thoughts and dreams emerge

without effort and is based on free will? If it becomes indeed possible, then will it follow Asimov's laws?

- Artificial Consciousness (ArtCons)
 - a relatively new topic with the quest to find ways to make machines self-aware and to some extent self-conscious. More details are at workshop website: artcons.github.io

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Role of Sensors in Robotics

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Introduction:

Robotics is an engineering discipline dealing with a technology to design, build and operate robots. The Oxford English Dictionary gives the following definition for robots: "A machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer". The definition gives us an idea, the robot has changed the working environments caused by the introduction of artificial intelligence systems. An important element of a robot that is not mentioned explicitly in the definition is the sensors. Today, Robots rely on sensors to support professionals working in robotics technology. To make an autonomous robot, sensors should be improvised to enable more intelligent control of the robot. Sensors can perceive the behaviours of robot to make them flexible, adaptable. Another part of the research focusses on the interaction between sensing and intelligence in robotics.

Sensors in robotics make the upgrade and could make robots feel more human than ever. As humans use their senses to collect data from the environment. From the collected data, it helps humans to make decisions. For example, if you touch fire on a candle, you will pull your hand away. What happens? The sensory organs provide feedback to the brain to take off your hand. Human uses senses to make observations about their surroundings. Similarly, sensors are used in robotics to understand their surroundings and make decisions. Thus, sensors play a major role in robotic fields. The usage of sensors in robots has taken them to next level of creativity. Most importantly, the sensors have increased the performance of robots to a large extent. At the same time, technology will be a key enabler in meeting these challenges. Robot sensing emerged and expanded in growth areas of process

control, automobile, space stations, health care, education, etc.

What is called Sensor?

A sensor is a component which acquires an input signal especially in terms of a physical quantity and converts it into a signal suitable for processing. In general, a sensor is a device that detects input from the environment. The output is an electrical signal for further processing.

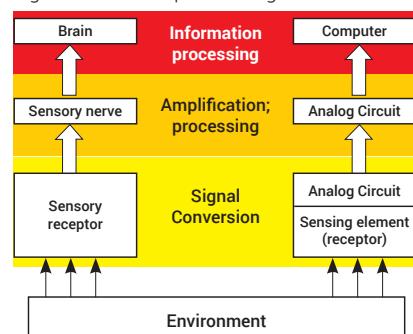


Fig 1. Sensing in human & sensor

Senses are analogue by nature for humans. In both cases (human and sensor), signals are provided from the environment and converted into a signal by receptors in humans. In the amplification/processing stage, sensors in the brain process the signal. The nervous system is comparable to an analog circuit. In case of sensor, analog Signals from the external environment are converted into electrical quantities using a transducer. The electrical signal is processed for further data transfer.

Let us take an example, a chemical sensor. Chemical sensors are small devices that convert chemical information (ion Concentration, activity) into an electrical signal. In the first unit, the receptor has an electrode. The electrodes interact with the

test chemical solution and the second unit, the transducer converts chemical reactions into an electrical or measurable signal.

Types Of Sensors:

There are essentially two categories of sensors namely Analog and Digital Sensor. Sensors are devices used to detect the changes in their environment, act according to the changes, and produces an electrical output.

Analog sensors in robotics:

The Analog signal is a continuous signal that varies with time. Some known analog signals are pressure, noise, force, speed, etc. The analog sensor detects the external signal in the environment and produces the continuous analog output. Some practical examples of analog sensors in robotics are:

1. Light Sensor:

Light sensors are very common in robotics, especially in robotics and object detection by measuring the amount of reflected light. The output is measured, according to the voltage difference in the light intensity which falls on the sensor. One import light sensor in robotics is Light Dependent Resistor (LDR)

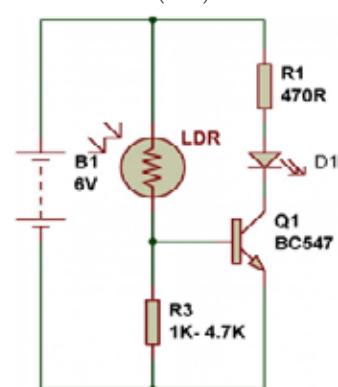


Fig 2: LIGHT DEPENDENT RESISTOR (LDR)

The circuit of LDR has a resistance which varies with the change in light intensity. The light intensity is inversely proportional to the resistance of LDR. Using LDR, Light follower robot can be designed.



Fig 3: Light Follower robot

A light following robot is capable of detecting and following the path determined by the user. The robot has two LDR sensors. If the LDR sensor on the right has incident light, the right dc motor turns on and moves rightward. If the LDR sensor on the left has incident light, the left dc motor turns on and moves leftward. If both sensors have incident light, the robot will move forward. If both sensors have no incident light, the robot remains stationary.

2. Tactile Sensor:

A tactile sensor is a device that measures information in response to the physical interaction from the environment. The sensor is modelled based on the sense of touch. There are two types of biological senses: cutaneous touch, which can detect the stimuli responding to the mechanical stimulation, pain, and temperature. The kinesthetic touch, which can respond to the receptor's internal inputs present inside the muscles, joints, tendons. Tactile sensors are mostly developed for use in robots. The

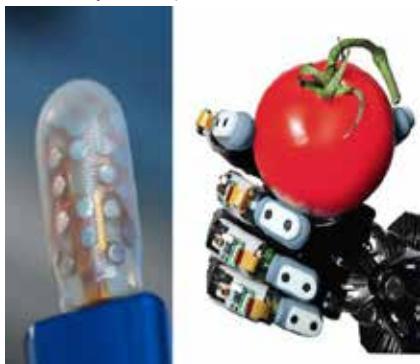


Fig 4: Tactile Robot fingers

tactile sensor determines the object's texture, shape, mass, etc. So, robots can interact with the object, which is equivalent to human tactile ability in handling the components.

Beginning with Robotic Manipulators, tactile sensors are predominantly used.

A robotic arm with a sense of touch like a human can be incorporated with the support of a wide range of sensors. The robotic hand should detect the shape of the object, the force exerted for lifting/release of the object, and tracking of contact points for manipulators.

3. Proximity Sensor:

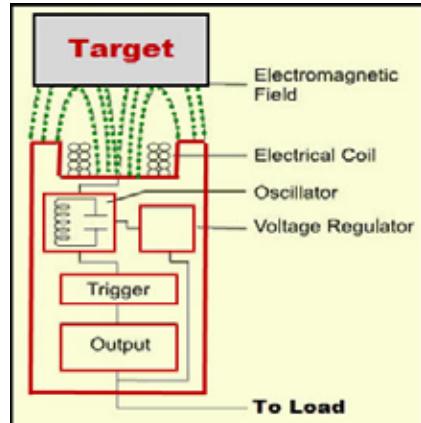


Fig. 5: Proximity sensor

A proximity sensor is used to detect the presence of a nearby object without any physical contact. It consists of a transmitter for either transmitting electromagnetic radiation or to create an electrostatic field and a receiver analysing the received signal for interruptions. For example, if an IR LED transmits an IR light on an obstacle, the light is reflected which is captured by an IR receiver. IR transceivers are also an example of the proximity sensor.



Fig. 6: Robot gripper with inductive proximity sensors mounted

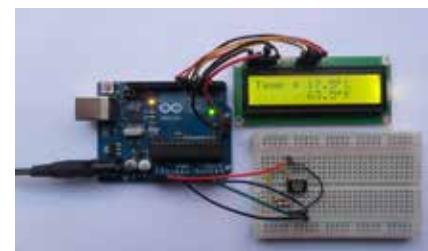
Also, the inductive proximity sensors work by a **direct method** on which the monitoring is done by detecting targets placed in the jaws directly. In which to indicate a fully open or closed position of the jaws, the movement of the jaw gripper mechanism is sensed by the proximity sensor.

Digital sensors in robotics:

A Digital signal is a representation of a sequence of values at any given time. Digital signals are binary or logic signals. Some examples of digital signals are computer data, digital pen, digital phones, etc. Digital sensors are electronic sensors, where the data is digitally converted and transmitted. There are three main components in digital sensors namely the Sensor, cable, and transmitter. The detected signal is converted into a digital signal by a digital sensor and transmitted digitally. Some practical examples of digital sensors are:

Digital Temperature Sensors:

Digital temperature sensors are simple instruments used to measure the degree of hotness/coldness and converts it into a readable unit. There are many types of sensors include a thermocouple, thermistor, Resistance Temperature Co-efficient (RTD), etc. One related example of temperature sensors is used in Industrial automation.



Fig/ 7: Digital Temperature Sensor

Digital Temperature Sensor eliminates the requirement of Analog to Digital converter (ADC). Here the required high-temperature and low-temperature values are predefined by the user, when the device reaching the given high-temperature value, the output TOUT becomes active and remains in the active state until the temperature of the device drops down to user-defined low-temperature value. On providing READ TEMPERATURE command in programming the temperature can be read through the 9-bit, two's complement reading.

Conclusion:

Robot Sensing and intelligence are increasingly equipped with more components. Robots depend on the sensors to provide information about the surroundings. Hence the more parameters of inputs given the more analytic the machine will be, capable of accessing and getting in

accordance with the surrounding, such that making self-decision at once with respect to the situation and this can be done by embedding sensors with them. Furthermore, sensor-based human-robot interaction is in the frontier of robotic research. Robot sensing technology is a significant challenge in

process industries, pattern recognition, data fusion. For example, remarkable examples of tactile sensors have been proposed in a wider range. However, their capability to address specific applications such as medical instrumentation, prosthetic devices, and augmented reality is questionable.

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(e-ISSN: 2277-7091)

Original Research Papers are invited for the **CSI Journal of Computing**, published on line quarterly (e-ISSN: 2277-7091) by the Computer Society of India (CSI). The Journal of Computing, offers good visibility of online research content on computer science theory, Languages & Systems, Databases, Internet Computing, Software Engineering and Applications. The journal also covers all aspects of Computational intelligence, Communications and Analytics in computer science and engineering. Journal of Computing intended for publication of truly original papers of interest to a wide audience in Computer Science, Information Technology and boundary areas between these and other fields.

The articles must be written using APA style in two columns format. The article should be typed, double-spaced on standard-sized (8.5" x 11") with 1" margins on all sides using 12 pt. Times New Roman font and 8-12 pages in length. The standard international policy regarding similarity with existing articles will be followed prior to publication of articles. The paper is to be sent to Dr. R. R. Deshmukh, Editor-in-Chief in the email id: rrdeshmukh.csit@bamu.ac.in with a copy to Prof. A. K. Nayak, Publisher, CSI Journal of Computing in the email id : aknayak@iibm.in

Prof. A K Nayak
Publisher

Robotics: A Future Race [Boon or Threat]

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Introduction

Robotics is a research area that relates to more than one branch of knowledge. It is an interface of Computer Science and Engineering. The main objective of robotics is to design intelligent decision-making machines that will help humans in their day-to-day life. Robotics gives us machines that can be used as a substitute for work done by humans and clone their actions. Robotics, as a branch of engineering, requires the manufacture, designing, programming, and operation of robots. Thus, it involves various fields of engineering, such as Computer Science, Artificial Intelligence, Electronics, Mechanical, Nanotechnology, and Biotechnology.

History & Evolution

Almost every person is aware of what a robot is, but it is surprisingly hard to give a perfect definition. The Oxford English Dictionary defines robotics as "A machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer." This definition includes a couple of significant elements:

- Carrying out actions automatically
- Programmable by a computer

The concept of Robots dates as far back as to the ancient CADMUS legends of the Greek mythology who are said to have incorporated dragon teeth which turned to soldiers. Another example of the existence of robotics in ancient times is PYGMALION, a legendary sculptor and king of Greek mythology, whose statue of GALATIA came to life. The modern concept of robots saw development in the Industrial Revolution through the introduction of electricity, which facilitated the operation of machines with compact and efficient motors. The notion of a HUMANOID (something which resembles the appearance of humans) saw its introduction in the early 20th century. The first use of robots in industries came through the robot named ULTIMATE in the year 1961. It was a programmable robot with a digital interface, used to lift the hot piece of metal from a die casting machine. The future



Fig 1.1: Evolution of Robots

Advantages	Disadvantages
Cost-Effectiveness The design of robotic automation is to work on a repetitive cycle without breaks of any kind. As long as the automation is maintained correctly through programming, it will continue to work repetitively. This highly efficient workflow helps recover the cost of investment within a short timespan.	Potential Job losses One of the biggest concerns of introducing robotic automation is the impact on the jobs of human workers. If a robot can function at a faster and higher consistency rate, then the natural fear is that humans may not be needed at all, thereby leading to unprecedented unemployment.
Improved Quality Assurance When human workers are tasked with repetitive tasks, the concentration level of workers is prone to decline over some time gradually. Robotic automation eliminates this limitation by accurately producing and checking items round the clock to meet the required standard without fail, immaterial of its repetitive nature. With more products going out of the factories, having undergone manufacturing at a higher standard, several new business possibilities get created, aiding the expansion of companies.	Hiring Skilled Staff Over the past decade, manufacturers have found it more challenging to source skilled staff members for roles demanding specialized knowledge. The introduction of automation adds another layer of requirement from staff, in the form of programming knowledge required for the operation of robots. This requirement results in additional overhead investment from the company for effective utilization of robotic machines.
Increased Productivity Usage of automated robots to accomplish repetitive tasks makes utmost sense, as the objective for the design of robots were to achieve repeated movements for tasks demanding it. The introduction of automation into our manufacturing process has brought in many different productivity benefits such as less delay, quality data for further enhancement, and many more.	Initial Investment Costs The cost incurred remains to be one of the most significant parameters factoring into the decision on whether a company would invest in automation or not. There is immense potential for substantial returns within a short period. However, the cash flow must be sustainable until profits start to come by, and the stability of the company is by no means worth risking if the profits are marginal.

awaits a whole new community or as I call it a whole new Advanced species, the ROBOTS, which would likely become a revolution, one day, as indicated in Fig 1.1.

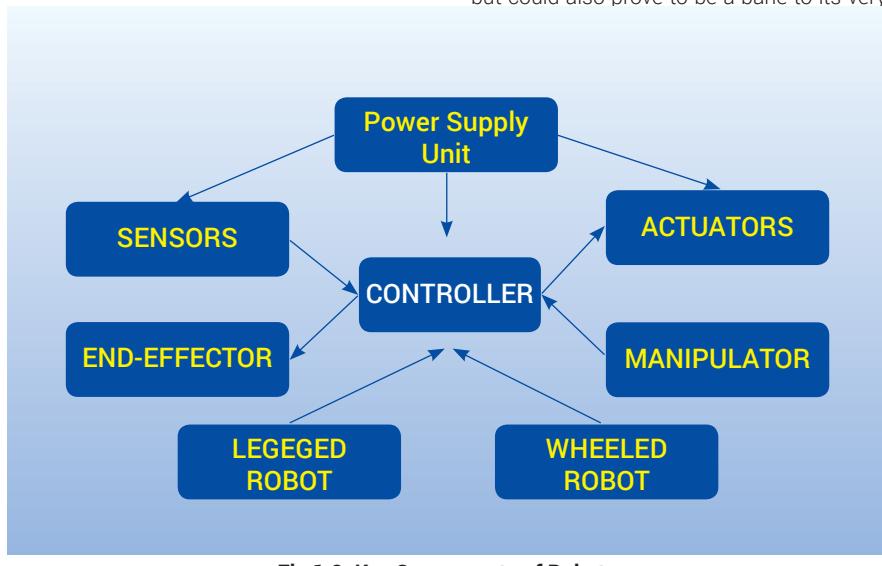


Fig 1.2: Key Components of Robots

The Key Components required for effective robotic operation are:

Component	Description
Manipulator	Just like the humans have an arm, the robot consists of an arm called Manipulator, which encompasses several joints and links. The original application of Manipulator was to handle radioactive/biohazardous materials carefully.
End effector	The base of Manipulator is fixed to the support at the bottom end, with the end effector attached to the other free end. The expectation from the end effector is to perform tasks handled by the palm and finger arrangements of the human arm.
Locomotion Device	In the case of humans, the powering for the movement of parts is provided by muscles. Likewise, in the case of robots, the thrust is provided by motors. The motors used for locomotion are primarily of three types, namely electric, hydraulic, and pneumatic type.
Controller	The computer acts as a controller to the robot and helps in performing the assigned tasks. The controller controls and directs the movement of both the Manipulator and the end effector. In other words, the controller is the brain of the robot.
Sensors	Just as the humans sense the environment through sense organs (eyes, ear, nose, tongue and skin), robot sense the environment through the sensors. Similar to how the brain cannot issue a command without data from the sense organs, the controller too cannot give commands unless data is sent to it by the components, acquired via sensors. The sensors are the instruments that help measure vital quantities such as temperature, velocity, torque, force, among others.

Applications of Robots

Outer Space:



Fig. 1.3: Sojourner robotic rover

Space exploration is one of the significant avenues where robots have played a critical role. Unmanned (Human-less) spacecraft were used for exploration of various planets, stars, and many other celestial bodies of space. One of the most notable projects utilizing the service of robots is the Mars Rover project of NASA. In 1997, the Pathfinder Mission of Mars Rover project landed on the surface of Mars, along with its robotic rover Sojourner, as indicated in Fig 1.3.

Generally, self-configuring robots are used in these space missions to account for and handle numerous unforeseen situations. These robots are capable of handling situations throughout the long missions and also help in the study of distinct characteristics and conditions around various celestial bodies.

Such robots also find application in uninhabited areas of our very own planet Earth, with the possible benefit of providing us new information about the area.

own creators. The biggest fear of humankind is that the robots could take over humankind one day and rule over us. The increase in scope for robotic automation across various domains looks set to continue for the next few decades, with businesses looking set to take advantage of the many benefits offered by robotics. There is room for some heed towards the adoption of robotics to the existing production, with reasonable objections put forth. Addressing both the sides, the following are some of the advantages and disadvantages of using robotic automation.

Components of Robots

To achieve the complete functioning of robots efficiently, we make use of a massive number of components. We see a considerable number of processes involved, starting from the powering of the robot until the execution of a particular task. Thus, there is a requirement to create specific components, for aiding synchronization of parts of the robot to achieve high efficiency in working operations, as indicated in Fig 1.2.

PROS & CONS of Robotics

Robotics is a massive boon to humankind as it has a significant potential to reduce human efforts required for any work, but could also prove to be a bane to its very

Home Applications: 	<p>The robot used explicitly for household activities is termed as a domestic robot. The modern concept of smart houses, which provides an automatic opening of door/window on sensing the arrival of an authenticated person, among other benefits, could also be termed as an application of robots. Fig 1.4 depicts a home application robot, that assists cleaning of the floor of the house through the sprinkling of water from the front nozzle and parallelly wiping the wet floor from the wiper attached to the back nozzle. The stress of manual cleaning is eliminated and also provides an additional benefit of remote cleaning, when away from home. Thus, we humans achieve multi-fold benefit of saving time and also not compromising on cleanliness in any manner.</p> <p>We can also deploy robots to monitor the security of home, environmental conditions and energy resources, among other key segments of human society.</p>
Military: 	<p>Another remarkable advancement of robots is in the field of military robotics. The Reaper drone, as indicated in Fig 1.5, has bought us quite a few remarkable achievements. These drones are capable of taking surveillance photographs and can launch missiles at ground targets with utmost precision. Major Kenneth Rose of U.S. Army's Training and Doctrine Command aptly described military robots through these words: "Machines don't get tired. They don't close their eyes. They don't hide under trees when it rains, and they don't talk to their buddies... A human's attention to detail on guard duty drops dramatically in the first 30 minutes ... Machines know no fear." The robots have all the potential to serve as an alternative to human soldiers, in the days to come.</p>
Health Service: 	<p>Health service is another specialized service where robots could turn out to play a significant role. Surgical robots and Rehabilitation robots have all the functionality to find widespread use in the medical field. These robots can be used to assist older, physically and mentally challenged individuals, round the clock, over long intervals of time effectively. The future also suggests robotic paramedic staff as a valuable helping hand to humans. Fig 1.6 depicts a surgery being carried out by robotic arms, bringing in additional benefit to treat patients carrying a contagious disease, like COVID-19 we are currently battling. This form of surgery using robotic arms reduces the risk involved in spreading of the virus to a human doctor and hence the further spread of the disease.</p>
Industry:  Fig. 1.7: Assembly of vehicle by robotic cranes  Fig. 1.8: Pick and place of nanoparticles for printed circuit board	<p>From the advent of the industrial revolution, robotic systems have found widespread application in the manufacturing industry. Manufacturing involves multiple fittings at different angles of working. To enable working at any angle, the most commonly used configurations of the industrial robots are:</p> <ul style="list-style-type: none"> ▪ Articulated Robots (Robot with rotary joints) ▪ Cylindrical Coordinate Robots ▪ SCARA Robots (Selective Compliance Assembly Robot Arm) ▪ Spherical Coordinate Robots ▪ Cartesian Coordinate Robots ▪ Delta Robots (Parallel robot with arms connected to universal base) <p>In the industry, activities like painting, pick and place of nanoparticles for printed circuit boards, packaging, product examination, and testing are all accomplished with high speed, precision and efficiency by robots, as indicated in Fig 1.7 and Fig 1.8.</p>

Summary

I thereby summarize this with my view stating that robots are, of course, a great help to humanity for reducing human work, but could also prove to outsmart humankind one day and take over the creators and hence this world. I therefore strongly suggest that in case we bring into force the evolution of robots, i.e. HUMANOIDS, we should strictly follow the laws of the robots as stated by writer Isaac Asimov in 1942, which are as follows:

- Robots may not injure a human being or through inaction, allow a human being to come to harm.

- Robots must obey orders given by human beings unless they conflict with the first law.
- Robots must protect its existence unless it conflicts with the first or second law.
- Robots may not injure humanity or allow humanity to come to harm. (Zeroth Law)

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Computer Society of India™

Call for Proposals from CSI Student Branches to organize

National / Regional / State Level CSI Student Conventions

during the year 2020-2021

Computer Society of India (CSI) organizes National, Regional, and State Level Student Conventions annually, to enhance the awareness on technological developments and applications, and foster creative professional orientations among the academic community. The Conventions, held at Student Branches, offer excellent opportunities to the students to manifest their technical proficiency and prowess through paper presentations, discussions and extensive interactions with peers and pioneers.

CSI invites Proposals from Student Branches to conduct the National/ Regional / State Level Student Conventions to be held during the month of October to December 2020.

Criteria:

The proposing Student Branch should be very active, with a track record of several CSI activities, and be in good standing through the years 2019-20 and 2020-21.

The proposals for convention will be evaluated, broadly based on the parameters given below:

- a) Number of years of continuous valid Student Branch at the college (without break)
- b) Average student strength over the past three years
- c) Number, quality and level of activities at the student branch
- d) Prompt submission of activity reports and financial accounts
- e) Ability to attract good speakers from Industry
- f) Availability of infrastructure and other resources
- g) Financial strength and potential
- h) Accessibility and other general conditions

All the National, Regional & State Student Conventions are to be completed according to the above schedule.

The CSI Student Convention Manual describes the guidelines and norms to conduct the student conventions.

The Proposal:

Interested Student Branches are requested to send electronic proposals in the prescribed format with all necessary data, including

the information stated below.

- a) **Type of convention proposed:** National / Regional / State level
- b) Proposed dates (at least one day for State level and two days for Regional and National level – please indicate two sets of dates)
- c) A statement of case why the SB should be considered favourably for the proposed event
- d) Signed undertaking by the Head of the Institution to provide all the required support (Document with scanned signature)
- e) Name & contact details of SBC and the coordinator-designate for the proposed convention

How to send:

The Student Branches may send the proposals in the prescribed format on or before 31st (Extended) October 2020 through the respective Regional Vice President, to the Hon Secretary (cse.hon.secry@gmail.com) and Vice President (aksaini1960@gmail.com), with a copy to Education Directorate (admn.officer@csi-india.org) and National Student Coordinator (pkumar_5@yahoo.com)

Selection:

A Committee constituted by CSI, including the Chairman, Academic Committee, Chairman Conference Committee, Honorary Secretary and National Student Coordinator will assess the proposals to select the host institutions in consultation with RVPs, RSCs and SSCs as per the requirement.

CSI Support:

CSI extends token financial grants for the technical events, in accordance with the availability of budgetary resources, subject to the approval of the Executive Committee. CSI also supports the publicity efforts for the Conventions.

Convention Helpline:

CSI-Education Directorate shall be pleased to offer any information or help on the convention. Please do contact Mr. Gnanasekaran (email: admn.officer@csi-india.org Mobile: 98403 41902) for any assistance.

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Evolution of AI into Machine Learning and Deep Learning: A bird's eye-view

► Achuthsankar S Nair

University of Kerala, Thiruvananthapuram

1. Introduction

'Artificial Intelligence', 'Soft Computing', 'Pattern Recognition', 'Artificial Neural Networks' etc have been around for a few decades now. In recent times, the field has been rebooted with the buzz words 'Machine Learning' and 'Deep Learning'. Applications of machine/deep learning has reached almost every one through variety of mobile Apps which use them. Face recognition, which once used to be a sophisticated research area, now runs successfully every moment, all over the world, when photos are uploaded to social media. In fact, it has stopped being a surprise at all (The saying that *AI is whatever hasn't been done yet*, makes perfect sense!). This article attempts to paint a bird's eye view of the field which may assist a learner to locate himself or herself in the knowledge-scape of ML and DL. The article does not provide a comprehensive coverage of any particular technology.

'Artificial Intelligence' (AI) was a generic term in the beginning, referring to all attempts to make a machine do something that can, in ordinary parlance, be considered intelligent. The term has gradually acquired different hues at different times. Robotics, automatic speech recognition, expert systems, pattern recognition were all considered branches of AI. In hindsight they were all referring to application sectors rather than methods or systems of AI. Artificial Neural Networks was a break from this. It was one of the paradigms under AI that did not achieve its standing from its application sector(s). The modern buzz words in AI, 'Machine Learning' and 'Deep Learning' also stand on their method rather than application sector.

Machine learning (ML) refers to solutions of problems modeled out of example solutions, rather than explicit algorithmic solution tailor-made for each problem. To predict the cost of a house, one can go the algorithmic way, in which

all measurements, types of materials used and their unit costs are provided and the cost is computed. In contrast, in ML, the images of large number of buildings and their costs are provided to a ML system, which learns how to predict the cost of a new building presented to it as an image (of course, images are one among the possible example data). A driverless car 'learns' to drive by being provided with the video camera footage of a real driving session, along with corresponding action taken by the driver at each instant (changes made to gear, clutch, brake, steering etc). Example data has become central to AI. As the size of data increases, the performance of the AI systems go up. Given sufficient example data, *ML systems can learn anything*. I am amused by the contrast of this situation to famous hypothesis of educational thinker Jerome Bruner, who said, *anything can be taught to anyone*.

At the core of ML paradigm, one could argue, is the traditional artificial neural network technology with some improvements made possible due to technological and algorithmic advancement in last two decades. However, Deep Learning, a sub-set of ML, cannot be considered so. In new ML systems such as Convolution Neural Networks (CNN), learning has been made fully automatic. In traditional ANNs, human intervention was required to extract relevant features from data for training, testing and prediction. In CNNs, the features are also learned by the network. These automatically learned features bring in a new dimension to ML. Not only are these abstract features not intelligible to the human being, but can be refined by using multiple feature extraction blocks, creating *features of features*, making learning deep. This *divya drishti* that human eye cannot capture, achieved through higher order representation of problem space, can

be used to perform complex classifications. This is the soul of the latest wave in AI.

2. Reasons for Powerful Re-emergence of AI as Machine/ Deep Learning

A number of minor improvements and alterations in structure and processing of traditional artificial neural networks have together improved their overall performance tremendously and solved many long-standing issues such as over-fitting and slow or no learning. These improvements along with hardware advances have enabled the repeated use of the various blocks¹ of learning models, leading to "Deep Learning".

2.1 Graphic Processing Units (GPUs) provide unprecedented computing power:

Though initially aimed at graphic processing, GPUs now work beside CPUs in non-graphic processing also, enhancing the computational power of the modern computers (to the tune of 10 trillion calculations per second). This makes the neural network training process lightning fast. Along with this, easy parallelization of computation is also a great advantage to Machine Learning.

2.2 Data and memory:

If we consider the last few years alone, it is estimated that society has created more data (perhaps 10 times) than what the whole humanity created till 20th Century. Availability of great volumes of data in public domain has made it possible to train and develop ML models in a variety of domains. Handling such voluminous and high throughput data has been made possible due to developments in the field of "Big Data Science". The compact and high-capacity memories also drive the use of big data.

2.3 Minor improvements in ML algorithms and processes:

¹ It is better to use the word 'block' rather than 'layer' in this context. Multi-layer-perceptrons used in Deep Learning have input, hidden and output layers. The hidden layers of these networks could also be repeated to achieve depth in learning, as they produce higher level abstractions of problem space. However, in practice, the 'repetition' done in Deep Learning is more likely a reference to the feature extraction blocks and/or pattern recognition blocks. VGGNet, for instance, consists of 16 convolutional blocks/layers.

Input Normalization:

Scientific methods (such as zero-mean and unity-standard-deviation) for scaling or modifying the raw inputs to improve learning, have become popular and are found to improve learning.

Variety of ways to initialize random weights:

The tradition has been to simply randomize weights to begin training of Artificial Neural Networks. Now, more scientifically designed weight initialization procedures (such as He-initialization, Xavier Initialization etc.) are available, which make learning faster and trouble-free.

Adaptive Learning Rate:

Learning rate is an important parameter, which in the past, used to be chosen using some thumb rules. Today, algorithms that help to optimally adapt learning rate, like Adagrad/AdaDelta/Adam/RMSprop, have made learning more smooth.

More ideal Activation Functions:

Sigmoid function used to be the most popular activation function used in ANNs. They create a problem called 'vanishing gradient' in layers farther from output layer. A series of new functions (ReLU, ReLU6, LeakyReLU etc.) are known to solve this.

Addition of Soft Max Output Layer:

Final output of ANN is converted to a probability distribution through softmax function. More effective output error functions such as cross-entropy are possible to be defined when soft-max function is used.

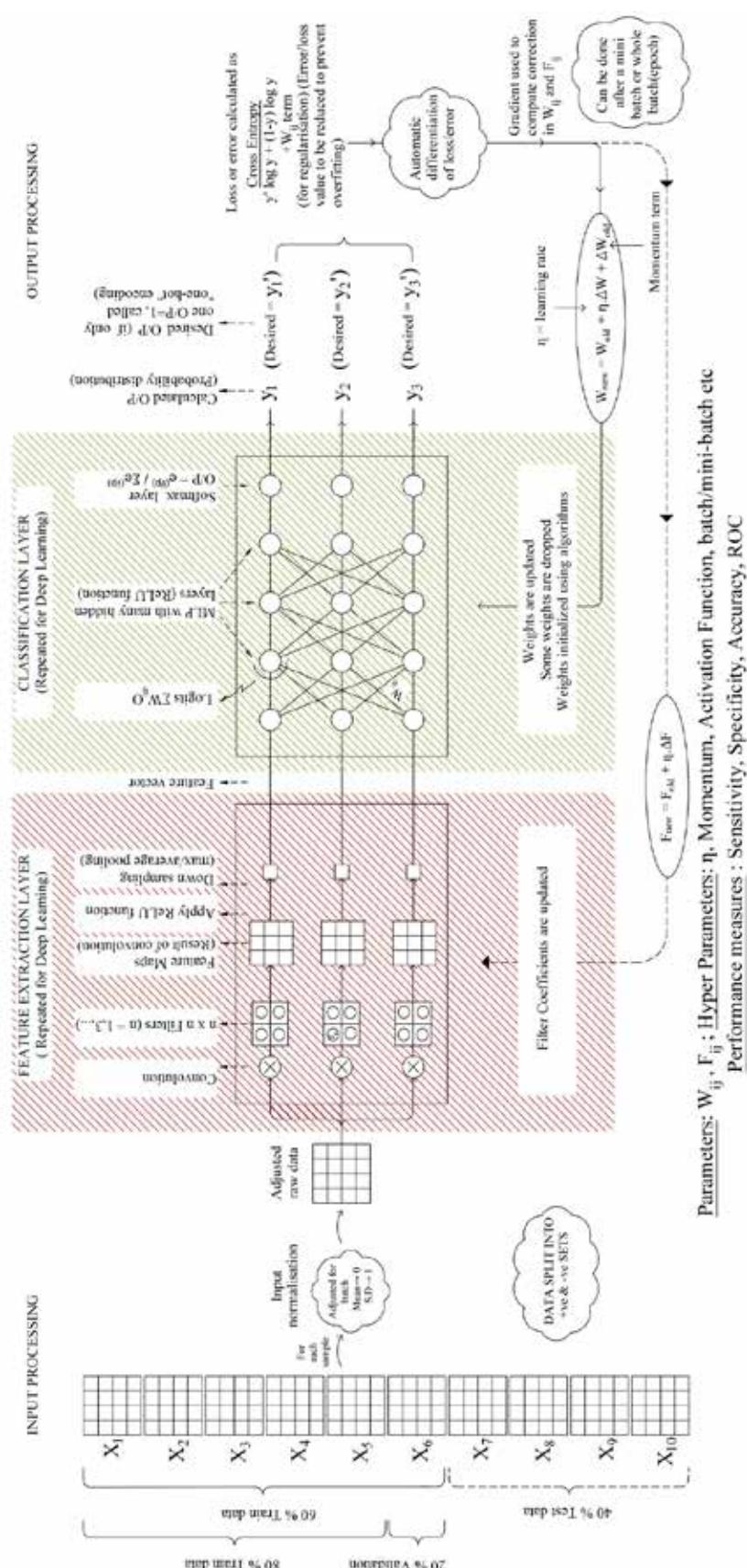
Better alternatives to simple least-square error (like cross-entropy):

ANN training is based on output error minimization. It is today understood that the popular least-square-error is not ideal for optimal learning. Alternate measures like Cross Entropy/Log Loss have proved to be better choices (when soft-max layer is added). It is also understood that not only output error, but weights also have to be minimized. The addition of a term involving weights to the error is done for this (regularization).

Dropout, Regularization and Validation to prevent Over-fitting.

A model that learns the training data too well will lose its ability to generalize (when test data is presented). This is handled effectively by three processes: Dropout (updating only randomly chosen weights), Regularization (adding weight term to the cost function) and Validation (testing the generalization performance during training itself and readjusting parameters

MIND MAP OF CONVOLUTION NEURAL NETS (CNNs)



accordingly). Early stopping is also helpful in preventing over-fitting.

Batch, Mini-Batch and SGD:

Rather than doing correction in weights after each forward pass (Stochastic Gradient Descent – SGD), correction based on error over mini-batch of the input data has been found to be better.

2.4 Convolution Neural Networks do not require features to be manually extracted:

This is perhaps the single biggest revolution in Machine Learning in recent times. Convolution Neural Networks (which specialize in image data) have a Convolution layer and a Classification layer (each of which can be repeated for achieving *deep learning*). The convolution layer learns (through training using back-propagation, just like the ANN) the significant features of the data useful for classification. These are learned as values of filter coefficients. The features thus derived are passed on to the classification layer (after downsizing/pooling) which then learns to classify the input data by training itself on the features. The classification layer is typically one or many ANNs. Thus, raw data can be directly fed to the ML system, without the need for manual intervention to define features. Both convolution and classification blocks can be repeated. These repetitions enable “depth” in problem abstraction and achieve “Deep Learning”. Many other ML systems (for example Auto-encoders, build on CNNs). The accompanying mind-map may be helpful in understanding the current techniques as applied to a typical convolution neural network.

2.5 Computational Graphs and Automatic Differentiation:

Once we define the forward pass, it is possible today to calculate the gradients automatically and back-propagate them

using packages such as Autograd. This, along with defining Computational Graphs (using packages such as Tensorflow), enable users to define new and complex forward passes without worrying about defining how to compute the gradient of errors. Thus new structures can be developed and tested easily.

2.6 Availability of Specialized & Powerful packages:

A number of packages like Tensorflow, Scikit learn, Keras, Torch etc which help developers to quickly start-up their models without programming basic elements from scratch and without struggling with any complicated mathematics. This, sometimes, result in beginners developing Machine Learning models which work perfectly, without the developers being able to explain how and why!. It is wise not to waste your energy in learning all the platforms, if you are a student just getting to know ML. I recommend you to initially confine to Tensorflow. Developing an ML system in Tensorflow, does not involve any rigorous programming logic, and is mostly a series of ready-made function calls.

2.7 Availability of ready-made/ transferable models:

Many ML models for generic applications (like mood identification, gender identification etc) are freely available in public domain. Some models which are pre-trained with generic data and which can be retrained for specific applications (process called transfer learning) are also available (these models have already the feature extraction procedure learned by the convolution block and the retraining will be mostly confined to the recognition block).

3. Successful applications

Many Successful Applications of ML/DL are known today. Face recognition

and related applications are perhaps the most popular among ML applications. It is reported that, in China, face detection cameras have been tuned to catch those who are inattentive in school class rooms ! The most impressive ML/DL application is perhaps self-driving cars. A long list of successful applications can be listed: Recognizing fake news/spam emails, virtual assistants which also personalize your experiences (Siri, Alexa, Googo), detecting credit card frauds, medical image analysis, automatic image colorization, automatic translation, automatic enhancement of image resolution ([Pixel Recursive Super Resolution](#)), automatic photo descriptions, predicting election results, predicting Covid spread, predicting population growth and playing Chess with infallibility (AlphaZero, developed by DeepMind, the artificial-intelligence company owned by Google's parent corporation, Alphabet Inc). Creative applications such as “deep dreaming” are also being developed now.

4. Concluding Remarks

A massive and impressive growth has surely been registered in the field of AI and they have percolated to everyone through popular Apps. As far as developers are concerned, new technologies involve less programming and more of readying data for learning. Achievements of AI in the past now look trivial. Learners face a peculiar problem. There is a deluge of new terminologies², concepts and tools. A novice has a hard decision to make – where to start. My personal advice to novices is to start with convolution networks and use Tensor Flow. These are no endorsement of their perfect superiority, a judgement of models and platforms can be evolved by learners as they progress in their learning curve.

² Literature in Machine Learning is full of jargon, some of which are specific to customized solutions, but tossed around as general! Also, many naming and re-naming have been introduced. Here are some of the jargons: Regulation, L1/L2 Normalision, one-hot encoding, ground-truth, logits, Hyper-parameter, Computational graph, cross-entropy, log loss, loss(error), batch, mini-batch, Stochastic Gradient Descent, Deep Learning, Co-variate Shift, Concept Shift, Kaggle, Pytorch, Tensorflow, Scikit, Tied Paramters, Gluon Model, Dense layers, Padding, Stride, Alexnet, VGG Block, Residual Blocks, DenseNet, Recurrant Neural Networks, Gradient Clipping, Gated Recurrent Units (GRU), MXNet, Skip-gram model, Pooling, Average Pooling, Max Pooling, Flattening, Gini Index.

About the Author



Prof. Achuthsankar S Nair is a senior member of the CSI, Chairman elect of the Thiruvananthapuram CSI Chapter and currently heads the Dept. of Computational Biology and Bioinformatics in University of Kerala. He is a past editor of the CSI Communications. He had his education from College of Engineering, Trivandrum; IIT Bombay; University of Cambridge and University of Kerala. He holds two PhDs- one in Engineering and one in Music. He has supervised over 25 PhDs and is an author of over 15 books.

Java celebrates its Silver Jubilee

The story of a language WORA (Write Once and Run Anywhere)

► Xavier Chelladurai

Professor, Department of Computer Science and Engineering, School of Engineering and Technology, Christ University, Bangalore 560074



Fig. 1: Happy Birthday Java 25

The programming community began their journey of Stored Program Concept with Assembly language. When they wanted a High-Level Language, FORTRAN was one of the popular choices until Dennis Ritchie made C Language. On those days, computerization was mainly to solve scientific and engineering problems. When business houses started computerization, the early attempt was to store the data and create some useful reports. The work was called *Electronic Data Processing (EDP)*. The programming language, COBOL (Common

Business Oriented Language) gained the popularity in business world.

As business applications evolved from simple to complex, programmers found it very difficult and almost impossible to develop the code. This took a few decades to realize that the challenge was mainly due to the *procedural programming paradigm*. There was a huge difference between how the *real-world entities* are there and how you try to *program*, with input, process and output. The reality is much more complex. It was a major challenge in the history of programming, we

can even call it a roadblock

Realizing the challenge, Bjarne Stroustrup and his team started enriching C language including the constructs required to build real life models. They called it C++. But unfortunately, C++ had some inherent issues because the classes and objects were a force-fit into the language.

Sun Microsystems team headed by James Gosling found a great opportunity to go to the drawing board and build a fully *object-oriented programming* language. That is how Java was born in 1995.

Java's runtime (JRE), and Java Virtual Machine (**JVM**) are considered to be the best pieces of software engineering and offers a solid foundation for Java. Many popular languages like **Kotlin**, **Scala**, **Clojure**, **Groovy** use JVM as their runtime. Recently, Oracle has changed the license for JVM.

History of Versions in Java

Java has crossed several milestones in its 25 years of journey, with some of them being minor and some major ones. Java faced a lot of challenges in the initial days because of its slow performance. The committed cross-platform capabilities were not exactly understood by the community. The Java team had to burn the mid-night oil to overcome initial teething issues and social perceptions for a few years. JDK 1.1 released in 1997 was the beginning of acceptance in the market. It introduced a few important features:

1. Remote Method Invocation (RMI) to support the client server services
2. Java Database Connectivity (JDBC) to support the database connectivity
3. Abstract Windows Toolkit (AWT) to design graphical user interface in Java
4. Reflections to make the coding transparent during runtime
5. Inner classes to help developers with flexibility

As the fundamental working design of AWT made it a heavy component, it pulled



Fig. 2A: Java Timelines



Fig. 2B: Java Timelines

down the speed of Java program. This was corrected by introducing the Java swing library in the next year during the launch of Java 2.

In the year 2000, J2SE 1.3 brought several interesting features such as :

1. Java Native Developer Interface (JNDI) to reuse the native code written in C
2. RMI for CORBA
3. Java Sound API to process sound files
4. Debugging Architecture to support the developer community

JDK 8 was a major milestone and then JDK 11 and 14 have brought in a lot of changes and fine-tuning to make Java a future ready language.

Free and Commercial packages of Java

There are now two versions of Java :

1. Free Oracle OpenJDK which can be used without a commercial licence for any purpose
2. Oracle JDK which can be used for testing and development without a commercial licence, but needs a paid-for licence if you use it in production.

Java competitors in the market

Right from the initial days, people speculated that C++ is a major competition for Java. Actually, Java was built on the learnings of C++. There is a piece of information that James Gosling initially wanted to name the project as C++- (C plus plus minus minus). Java came into existence as a *clean object-oriented programming language*. The very concept of JVM was a great evidence to create credibility among the developer community on WORA (*Write once and Run anywhere*). Actually, at that time several languages promised WORA. But

Java was the first to implement it. The major challenge was the speed of Java. There were several funny comments on the speed of Java. It was very slow initially. JVM was a opensource platform. Using this freedom, several languages entered the market. Some notable languages were, Clojure, Groovy, Scala. Apple introduced *Objective-C*, which is very similar to *SmallTalk*. Now they have another language *Swift* and it is expected that *Swift* will replace *Objective-C*.

From outside the JVM world, some notable rivals were,

1. C#, A Microsoft language created to replace Java.
2. Ruby,
3. Python.
4. Google has introduced GO. Actually, one of the creators of C language, Ken Thompson has created GO.
5. Kotlin
6. Swift
7. Mozilla introduced a language called Rust which uses manual memory management.

However, we can safely say that Java doesn't have a credible rival in the past 25 years.

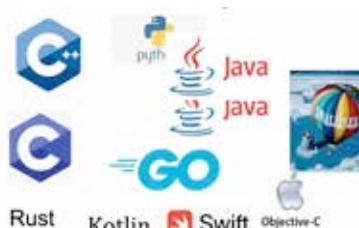


Fig. 3: Java Competitor Languages

Java in the Server-side programming

(Backend)

In the server-side programming, *JSP* has been very successful. Java team was the first to introduce the concept of *Application Server*. Java introduced the following features to make the server-side programming rich and fast:

- Java Server Pages (JSP)
- Servelets
- Enterprise Java Beans.

In order support the server-side deployment Webservers such as, *Apache Tomcat*, *Jetty*, *Jboss*, *Geronimo*, *GlassFish* entered the market. These are all opensource servers. However, *BEA Weblogic*, *IBM Websphere* also became very popular.

In my experience, when I was supporting a Europe based Telecom Service provider. We managed a very complex *Order Management Platform* deployed on Websphere. The orders enter into the platform as an XML file. The Java platform recognizes the order, splits them into several subtasks and sends to other systems and track the closure of the order. There were more than 50 upstream and downstream applications running, not everything in Java. In Websphere we deployed around 25 Java Servers running concurrently. Four Database servers were also supporting the services. It was a complex environment and Java was supporting such critical activity having a few million transactions per hour.

Java in the Client-side programming (Frontend)

Let us now look at the client-side programming. In the case of web-based applications, *HTML* and *Javascript* are used to design the front end. Javascript is used for the data validation and similar business logic. For example, if the user is prompted to enter the age of the person, the input is validated accordingly. It cannot be as large as 200 or so. As Javascript code runs at the browser, there is a security concern. In order to solve this concern, Java introduced the *Applet* class. This was secure and hence well received among the developer community. As there were performance issues in the AWT library, Swings were introduced. Afterwards Java FX was introduced. But there were not many users. Finally, due to the issues in the browser support Java lost the battle and decided to remove the Applets from their pack in 2018. Java AWT and Swings are used in the front-end design in the ordinary

applications.



Fig. 4: Java in the frontend

Java and Android

We must discuss Android story together with the historical decision of Oracle to acquire Java. Sun Microsystems, the original owner of Java was happy in having it as a OpenSource platform and allowed Google and the rest of the world use Java for their Android applications. Java became popular in the Android platform. Oracle, after the take-over of Java in 2020 has introduced the licensed version of JDK. Oracle has now, filed a suit for copyright infringement and damages because Google stopped Oracle from developing Java Mobile in its own right. The final verdict is pending in the Supreme Court.



Figure 5: Java and Android

Industry implementations of Java

Java is a technology that powers the world. There are 30 billion devices running Java code. These devices range from simple household devices to complex space

research sensors. The cash machines used in the Financial services sector run with Java code. Java code is used in the Automobile industry in various applications ranging from simple testing of the performance of the spare parts to the autonomous vehicles.



Fig. 6: Industry Implementations of Java

The following is a sample list of popular Java Applications developed so far:

1. Maestro Mars Rover controller.
2. JavaFX Deep Space Trajectory Explorer.
3. NASA WorldWind
4. JMARS and Jmoon
5. Small Body Mapping Tool (SBMT).
6. Elastic Search
7. Wikipedia
8. Artificial Intelligence platform H2O.ai
9. Apache Hadoop
10. Oracle Fusion Middleware
11. Visible TESLA
12. Samsung SmartThings



Fig. 7: Some Popular applications in Java

About the Author



Dr. Xavier Chelladurai is currently Professor, Computer Science and Engineering, Christ University. His research interest includes Artificial Intelligence Technologies and Parallel Computer Algorithms. He has been serving the academia and industry for the past 37+ years. He is the author of more than 20 Computer Science Technical books, most of them prescribed in the syllabus of various Indian and foreign universities, more than 10 research papers, more than 20 educational videos published in YouTube. He was the Vice President and Global Head of Artificial Intelligence in Capgemini before joining Christ. In this role he provided consultancy in design and development of Artificial Intelligence based systems that transformed the business of the customer. He has guided 7 Ph. D. scholars successfully complete degree.

He is a Java practitioner for 25 years and his Java book published by McGraw Hill India Education celebrated its Jubilee recently. Artificial Intelligence and Machine Learning practitioner with 19 years of industry experience and 18 years of education and research. He was member of IT Task force for three years in 1998-2001, which is a IT technical advisory body for Govt of Tamilnadu.

Java continues to lead the game

From TIOBE programmer's community index published in 2020, it is evident that Java continues to be in the top three places for the past 20 years. Oracle has published its plans of having a release every six months to keep the language and its developer community vibrant. Java 15 has been released in September 2020.

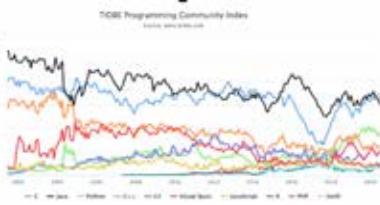


Fig. 8: Java Performance in the market

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- [4] TIOBE Index for July 2020 <https://www.tiobe.com/tiobe-index/>
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Computer Society of India™

Call For Paper

Digital Transformation eReadiness for Self Reliance

Digital Transformation: eReadiness for Self-Reliance

Dates: 11th, 12th, 13th & 14th February, 2021 at Lucknow

The Annual Convention of Computer Society of India (CSI) is proposed to be held on 11, 12, 13 and 14 February 2021 at Lucknow, the capital city of the largest state of India - Uttar Pradesh. The Convention with the theme Digital Transformation: eReadiness for Self-Reliance, includes several activities like the International Conference, Pre-convention Tutorials, Student-level Poster/Paper Presentation Sessions and Competitions apart from Statutory Meetings of CSI and Award Ceremonies etc.

Tracks of the Convention: There will be following significant tracks of the conference-

Track 1: Self Reliance through ICT & IT: Services and Infrastructure

Track 2: Changing ways in Governance for Self Reliance: Policies and Frameworks

Track 3: Use of ICT in Making Agriculture and Defence Self Reliant

Track 4: Use of ICT in Making Education and Research Self Reliant

Track 5: Interdisciplinary approaches and applications for Self Reliant

Track 6: Entrepreneurship Challenges: From Jobseeker to Job provider

Call for Papers:

Searching for opportunities, between the battle of saving human lives and stagnating economies in this challenging time of the pandemic, the emphasis of the Government of India is to regain the lost status of the Nation known as 'Sone ki Chiriyा'. To spur economic growth in India and to overcome the current crisis, the Government has announced "Atmanirbhar Bharat Abhiyan" (Self-Reliant India Scheme) with a quote "Economy, Infrastructure, Technology-driven System, Vibrant Demography and Demand will be the five pillars on which India's self-reliance will be based". A technology-driven "Atmanirbhar Bharat" relies heavily on digitising India,

with an emphasis on health, education, governance, agriculture, defence, engineering/technology and other sectors. The aim is to create and sustain the ability to produce quality products in a cost-competitive manner in order to compete with any country in the world and to priorities cottage and home industries, small and medium enterprises (SMEs) and other ancillary industries. The effects of this reorientation towards domestic manufacturing are already visible in India's International Trade Policy, where it seems determined to protect its domestic policy space. It not only deals with manufacturing the products and services but also ensures that the deliverables reach even to the citizen standing at the last step of the economy. The theme of the Convention Digital Transformation: eReadiness for Self-Reliance, is inclined towards having a broader look and to explore the possibilities for futuristic India.

We wish to bring together innovative academia and industrial experts to a common forum to deliberate on this issue. We seek active participation from End users, Academicians, Researchers and other faculty members from various esteemed institutions/research organizations. It will be a matter of delight to have a personal presence at the Convention and hear what the technology experts and researchers have to share about the technology advancements and their impact on our daily lives and the steps to be taken towards making India self-reliant.

Paper Invite: End-users, technocrats and academicians, researchers including research scholars and students are invited to this Annual Convention to deliberate and discuss the issues and showcase their original research work related to the theme of the convention, which pertains to the need of the hour i.e. development in the infrastructure, bringing the existing

human resources at par with the needs of any organization, the utilization of Information Communication Technologies and Information Technology infrastructure for making India self-reliant, which has been made in reference to the following themes (but not limited to these themes) :

Paper Themes:

Digital Transformation and Innovation

- Internet of Things & Applications
- Block Chain Technologies
- Digital Infrastructure for Every Citizen
- Governance & Services on Demand
- ICT in Health Care
- Social Media Networks
- ICT in Human, Social and Ecological Compatibility
- E-Learning & MOOCs
- Data Visualization

Artificial Intelligence & Virtual World

Artificial Intelligence

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ Computational Intelligence ▪ Knowledge Acquisition ▪ Automated Software Generation ▪ Swarm Intelligence | <ul style="list-style-type: none"> ▪ Computer Simulation ▪ Human Computer Interaction ▪ Genetic Algorithms |
|--|---|

Machine Learning

- Artificial Neural Networks (ANN)
- Reinforcement Learning
- Deep Learning
- Adversarial Machine Learning

E-learning

- Word Embedding
- Digital Repositories
- Photo Sharing
- Social Networking
- Subscribed Content Delivery

Expert Systems

- Expert Systems for Industry
- Expert Systems for Medicine and Health

Natural Language Processing

- Signal and Speech Processing
- Geo Informatics & Remote Sensing
- Game playing

Machine Vision

- Computer Vision
- Brain-Machine Interface
- Medical Diagnosis
- Robotics and automation
- Biomedical Engineering

Virtual World

- Virtual Reality
- Virtual Entertainment
- Virtual Society
- Digital Library

Data Analytics and Big Data

- Data Science
- Data Mining

- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ Data Analytics ▪ Secured Computing ▪ Pattern Recognition ▪ Performance Evaluation ▪ Big Data Analytics | <ul style="list-style-type: none"> ▪ Predictive Analytics ▪ Human Computer Interaction ▪ Intelligent Database Systems |
|--|--|

E-Governance and Business Intelligence

E-Governance

- Digital Democracy
- ICT for Sustainable Economic Development
- ICT for Pandemic & Disaster Management
- ICT Challenges for Self Reliant India
- Digital Empowerment of Citizen
- Digital and Green Economy
- ICT for Social Development
- ICT in Creation of Wealth
- ICT in Job creation & Poverty Alleviation
- Digital Infrastructure as a Utility to Every Citizen
- Governance & Services on Demand

E- Commerce

- ICT in On-line Marketing & purchasing
- ICT in Retail Chain Management
- ICT in On-line Auction Systems
- ICT in On-line Booking (ticket, Seat Etc.)
- ICT in Online publishing & advertisements
- ICT in Financial Management
- ICT in M-Commerce

Business Intelligence

- | | |
|---|---|
| <ul style="list-style-type: none"> ▪ Dashboards ▪ Reporting | <ul style="list-style-type: none"> ▪ Visualisation ▪ ETL & OLAP |
|---|---|

Data Communication, Computing & Innovation

Computing

- Algorithms
- Evolutionary Algorithms
- High Performance Computing
- Cognitive Computing
- Cloud Computing
- Embedded Computing
- Human-Centred Computing
- Digital Twins
- Quantum Computing
- Distributed And Parallel Systems
- Grid Computing
- Scalable Computing
- Mobile Computing

Internet and Web Applications

- Networking
- Open Spectrum Solutions
- Cognitive Radio
- Wireless/ Mobile Communication
- Mobile Ad-Hoc Networks
- Networks With Memory
- 5g Wireless Technologies
- Next-Generation Wireless Communication
- Signal Processing
- Communication Protocols
- Satellite Communication Systems
- 4g/5g Network Evolutions
- Software Defined Networking
- Wireless Sensor Networks

Network Security and Data Protection Security

- Cyber Security
- Computing Ethics
- Data Compression
- Ethical Hacking
- Digital Forensics
- Facial Expression and Emotion Detection
- Security & Cryptography
- Data Encryption
- Data Fusion and Security

Important dates:

Regular Track Paper Submission Last date : 10th December 2020

Author Notification

15th January 2021

Registration Deadline

20th January 2021

Conference Dates

11th, 12th, 13th & 14th February, 2021

Convention Website:

Please visit the conference website for more details: <http://csi-india2021.org/>

CALL FOR NOMINATIONS

CSI National Elections 2021-2022/2023

Dear CSI Members,

Greetings from Nominations Committee 2020-21 of Computer Society of India (CSI).

Under CSI Byelaws (Section 5: Nominations and Elections) of the Computer Society of India, the Nominations Committee (NC) is required to invite appropriate groups of Members to submit names of voting members for considering them for the various elective offices of the EXECUTIVE Committee & Nominations Committee (NC).

Members are accordingly invited to submit names of Candidates who are valid voting members of high professional standing, Integrity & experience for the following offices of Executive Committee (ExecCom) and Nomination Committee (NC).

For the Term 2021-2022 (upto March 31, 2022)

1. Vice-President (President Elect)
2. Nominations Committee (3 members)

For the Term 2021-2023 (upto March 31, 2023)

1. Hony. Treasurer
2. Regional Vice-President (Region 1): Delhi, Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir, Uttar Pradesh, Uttarakhand & other areas of Northern India.
3. Regional Vice-President (Region 3): Gujarat, Madhya Pradesh & Rajasthan
4. Regional Vice-President (Region 5): Karnataka & Andhra Pradesh
5. Regional Vice President (Region 7) Tamil Nadu, Pondicherry, Andaman & Nicobar, Kerala And Lakshadweep
6. Divisional Chairperson (Division 1) – Systems
7. Divisional Chairperson (Division 3) – Applications
8. Divisional Chairperson (Division 5) – Education and Research

Note:

All nominees and their proposers must refer to the eligibility conditions for the respective posts as outlined in the CSI Constitution and Byelaws.

The proposal for Nomination should be accompanied by (in prescribed format): Available on CSI web site

1. Signed letter/ E-mail from at least two valid voting members proposing the Nominee.
2. A signed letter/ E-mail from the Nominee confirming:
3. Acceptance to stand for election to the nominated office.
4. Willingness to devote adequate time for the Society's work.
5. Commitment to attend at least three ExecCom Meetings in a year (Not for Nominees to NC).
6. Two Passport size Photographs (printed) (3.5 cm X 4.5 cm) or softcopy of 413 x 531 pixels (300 dpi).
7. Statement of Intent on how the nominee intends to serve the Computer Society of India.

S. No	Activity	Date/s
1	Start of Call for Nominations	15th October 2020
2.	Last Date for Receipt of Nominations	15th November 2020 (5.00PM)
3.	Last date for Withdrawal of nominations	17th November 2020(5.00pm)
4.	Scrutiny and Finalization of Election Slate and its communication to ExecCom	21st November 2020
5.	Publication of Election Slate on CSI Elections Website with link of bio data and statement of Intent of candidates	10th, December 2020
6.	Email Posting of login and passwords to Members through Email.	30th December 2020
6	E-Voting starts (E-ballots)	1st. January, 2021
7.	E-Voting Ends	31st. January, 2021
8.	Declaration of Election Results on CSI Elections Website & communication to ExeCom	5th February, 2021
9.	Sending of Elections Results to the candidates & Registrar of Societies	6th February, 2021

Note:

The dates may be changed by the Nominations Committee, if required – by suitable announcements on the CSI Website Homepage www.csi-india.org

All members are requested to register/update their latest e-mail Ids and mobile numbers well before the beginning of voting process by sending an email at csi.hon.sec@gmail.com. **NO CHANGE IN EMAIL ID OR MOBILE NUMBER WILL BE PERMITTED DURING THE PERIOD OF ELECTION.**

For more details on Elections, please visit www.csi-india.org

Nomination Committee (2020-21), Computer Society of India

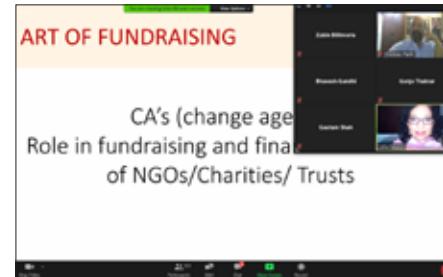
Sd/-
N. Anand Rao
Chairman

Sd/-
Sharvari Tamane
Member

Sd/-
Anil G Garg
Member

Virtual Workshop on Charitable Trusts – Critical Aspects

Reported by Pradeep Rathi, RVP, Region-VI



A three-day workshop on **Charitable Trusts – Critical Aspects** was organized jointly by Bombay Chartered Accountants Society (BCAS), Computer Society of India (CSI) and HelpAge India.

The basic need of the said workshop was as there is a paradigm shift in various laws and compliances in our country which are affecting not only businesses but also activities of charity. Humanitarian acts of expressing gratitude towards the society and taking responsibility is a major motive for all charitable activities but empty hands often rest down best of the intentions and purpose upliftment through charity or often not achieved by most of the trusts.

Non receipt of funds coupled with loss due to penalties and tedious compliances are a key area to work upon. The workshop attempted to provide a sound understanding of managing various facets of the trust and also look out for alternate and new ways of management with ease of trustees while advise diligently for the professionals like Chartered Accountants, Fund Managers and IT Professionals on the following:

- Going forward what precaution Charitable Institutions should keep in mind due to evolving Income Tax Laws
- Feasibility and Impact of Social Stock Exchanges in India
- Management of Charitable Institutions as a Self-sustainable Model
- Art of Fundraising and Finance
- Presentation on Issues under Goods & Services Tax (GST) for the NGO's/Trusts
- FCRA Non-compliance Penalties and Compounding Procedures

The workshop was inaugurated by Mr. Anurag Sahay, Commissioner of Income Tax (Exemptions). In the opening panel discussion Mr. Anurag Sahay shared his views along with CA Gautam Nayak, past President of BCAS and CA (Dr.) Gautam Shah. The other distinguished speakers in the workshop were Mr. Ishaat Hussain, Director SBI Foundation; Mr. Pradeep Rathi, Entrepreneurship & Innovation Ecosystem Enabler, Advisor India – Alibaba Cloud and RVP-6 CSI; Ms. Usha Menon, Executive Chairman of Usha Menon Management Consultancy, Singapore; CA Naresh Sheth and Mr. Noshir Dadrawala, Chief Executive of The Centre for Advancement of Philanthropy.

The workshop was attended by Trustees, Senior employees of charitable trusts, Chartered Accountants, Tax Consultants, professionals associated with the running and administration of Charitable trusts and companies who are partnering with Charitable Trust for CSR implementation.

Mr. Pradeep Rathi presented a new framework for building an

Exponential Organization (ExO) which is applicable to NGOs, Companies and Startups. Mr. Rathi advised that "**Information accelerates everything**" – as industries digitize hyper growth follows. Therefore, if you shift your organization to information - based environment, then you can accelerate the pace of growth to an exponential level, where performance will double every year or two, provided you concentrate on detecting meta-trends or trends consisting of many other trends. Mr. Rathi laid emphasis on that just understanding technology is not sufficient to build an organization, as new technology is already making today's tech obsolete. You need a whole new way of thinking where the old top-down, risk-avoidance approach no longer works. You need to morph in to platforms with user communities that can grow forever. The biggest risk for an organization is to take no risk at all. He advised that you can also become an Exponential Organization by developing disruptive technologies yourself. But keep the tech independent from the mother organization, then use it.

The actionable advice given by Mr. Rathi was that

- **Exponential organizations are the future of business.** If your company is to survive, you must adapt ExO thinking and practices. So whether you're founding a start-up or transforming an existing organization, outline a clear massive transformative purpose, get a flexible team and don't rely on linear planning. Expect the unexpected and always rely on your creativity.
- **Don't plan too far ahead.** Remember that most successful ExOs don't outline plans more than a year out. The five-year or ten-year plans huge companies used to create will only weigh you down in today's business world. Instead, be prepared to face unexpected challenges and tackle them with a creative and open mind.



Management of Charitable Institutions as a Sustainable Model

by Pradeep Rathi

Regional Vice President (Region VI)
Computer Society of India

Advisor India
Alibaba Cloud

Founder & Mentor-in-Chief
3i Zone





Pre - Mentoring



Workshops



Panel Discussion



Pitching



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BVICAM Activities

Organised by **Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi and CSI**



One Week Capacity Building Workshop on Moodle

07-12 September, 2020

Workshop was organised in collaboration with

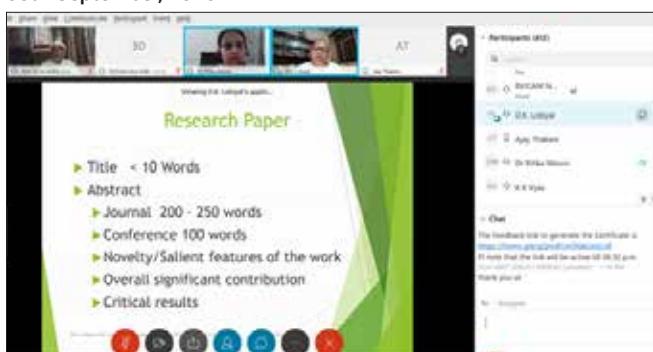
1. Computer Society of India (CSI), Mumbai
2. IEEE Delhi Section
3. Computer Science (CS) Chapter of IEEE Delhi Section
4. Consultants Network Affinity (CNA) Group of IEEE Delhi Section
5. Inter Society Relations (ISR) Standing Committee of IEEE Delhi Section
6. Industry Relations (IR) Ad-Hoc Committee of IEEE Delhi Section
7. Institution of Electronics and Telecommunications (IETE), Delhi Centre
8. Indian Society for Technical Education (ISTE), Delhi Section
9. The Institution of Information Technology Professionals (IIITP), Safa Society, New Delhi

10. IIPC, AICTE, New Delhi

The workshop was open to the teachers from all the streams of higher and technical education. During the programme, the participants were given Assignments based on the sessions and they also underwent a quiz based on MCQ Tests. The programme observed active participation of faculty members from different states of the nation. Last day of the programme i.e. on 12th September, 2020, also witnessed a Valedictory Session. Prof. M. N. Hoda welcomed all the guests and thanked all the speakers & participants to make this workshop a successful event with positive outcomes. Guest of Honour, Prof. A. K. Nayak, Immediate Past President, Computer Society of India, congratulated the organizing team for successfully conducting the workshop. Chief Guest of the session, Prof. K. K. Aggarwal, Chairman, National Board of Accreditation (NBA), New Delhi Former Founder Vice Chancellor, Guru Gobind Singh Indraprastha University, New Delhi, congratulated and thanked all the participants for attending this workshop. He motivated all the attendees to develop a passion and make self-commitments to bring all round changes in the academic processes.

Webinar on "Research Methodology"

05th September, 2020



The Webinar was organised in collaboration with

1. Computer Society of India (CSI), Mumbai
2. Computer Science (CS) Chapter of IEEE Delhi Section
3. Consultants Networks Affinity (CNA) Group of IEEE Delhi Section
4. Inter Society Relations (ISR) Standing Committee of IEEE Delhi Section
5. Industry Relations (IR) Ad-Hoc Committee of IEEE Delhi Section
6. Life Members Affinity (LMA) Group of IEEE Delhi Section
7. Institution of Electronics and Telecommunications (IETE), Delhi Centre
8. Indian Society for Technical Education (ISTE), Delhi Section
9. The Institution of Information Technology Professionals, Safa Society, New Delhi
10. IIPC, AICTE, New Delhi

The Webinar was held on 05th September, 2020 in the benign presence of the dignitaries including Prof. Subrata Mukhopadhyay, Chairperson, Consultants Network Affinity Group and Former Chairperson, IEEE Delhi Section. Prof. R. K. Vyas, National President, CSI welcomed all the invited guests and participants. Prof. M. N. Hoda, Director, Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi also addressed the session and discussed the background note of conducting such Webinars through virtual platforms. The webinar was blessed to have inaugural address by Prof. Subrata Mukhopadhyay giving a brief background of the all these webinars in collaboration will all the premiere professional societies, including the vital information on Research Methodology.

Prof. D. K. Lobiyal, Former Dean, School of Computer Science and Information System, JNU, New Delhi, was the lead speaker. He first introduced the topic to the participants. He discussed that Research Methodology is not only important to write research papers or undergo with Ph. D. Work, but also to understand the background the subject and analyse it for an in-depth study.

The session concluded with Question & Answer round where participants willingly asked their queries, followed by concluding remarks by Prof. Ajay P. Thakare, Chairman, TPPC, IETE, New Delhi. Prof. M. N. Hoda gave his heartfelt appreciation to Prof. Lobiyal for his insightful and detailed session. He also thanked all the participants and panellist for giving their precious time for having participated in this webinar and also making all the other webinars hosted by BVICAM, a huge success. The webinar attracted huge participation from across the country and abroad like Saudi Arabia, UAE, Canada, Bahrain, Ethiopia, etc.

Webinar on “Robotics and Automation Processes”

12th September, 2020

The Webinar was organised in collaboration with

1. Computer Society of India (CSI), Mumbai
2. Computer Science (CS) Chapter of IEEE Delhi Section
3. Consultants Networks Affinity (CNA) Group of IEEE Delhi Section
4. Inter Society Relations (ISR) Standing Committee of IEEE Delhi Section
5. Industry Relations (IR) Ad-Hoc Committee of IEEE Delhi Section
6. Life Members Affinity (LMA) Group of IEEE Delhi Section
7. Institution of Electronics and Telecommunications (IETE), Delhi Centre
8. Indian Society for Technical Education (ISTE), Delhi Section
9. The Institution of Information Technology Professionals (IITP), Safa Society, New Delhi

IIPC, AICTE, New Delhi The Webinar was held on 12th September, 2020 in the benign presence of the dignitaries including Prof. Subrata Mukhopadhyay, Chairperson, Consultants Network Affinity Group and Former Chairperson, IEEE Delhi Section. Prof. R. K. Vyas, National President, CSI welcomed all the invited guests and participants. Prof. M. N. Hoda, Director, Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi also addressed the session and discussed the background note of conducting such Webinars through virtual platforms. The webinar was blessed to have inaugural address by Prof. Subrata Mukhopadhyay giving a

brief background of the all these webinars in collaboration will all the premiere professional societies, including the vital information on Robotics and Automation Processes.

Dr. George Tsaramiris, Higher Colleges of Technology, United Arab Emirates (UAE), was the lead speaker. He first introduced the topic to the participants. He discussed that Robotics is the grindstone of automation, capable of revolutionizing the production and service sectors. Robots are common in production lines and assembly lines as they are tireless, stronger, more precise and faster than humans. However, as technology advances in the areas of energy and artificial intelligence, robots are becoming common in even more areas that were traditionally dominated by skilled human workers such as drivers, waiters and many more. Robots and intelligent agents, started to make their appearance in jobs that demand higher intellectual capabilities like medical doctors, lawyers and so on. He also discussed that the cost of the Robots have been dramatically reduced over the past two decades, making Robots. However, adopting robots to an organization is not an easy task and will require changes to organizational structure, business processes and culture.

The session concluded with Question & Answer round where participants willingly asked their queries, followed by concluding remarks by Prof. Ajay P. Thakare, Chairman, TPPC, IETE, New Delhi. The webinar attracted huge participation from across the country and abroad like Saudi Arabia, UAE, Canada, Bahrain, Ethiopia, Maylasia, Qatar, etc.

Webinar on “Cyber Warfare, Cyber Security and Cyber Citizenship”

18th September, 2020

The Webinar was organised in collaboration with

1. Computer Society of India (CSI), Mumbai
2. Computer Science (CS) Chapter of IEEE Delhi Section
3. Consultants Networks Affinity (CNA) Group of IEEE Delhi Section
4. Inter Society Relations (ISR) Standing Committee of IEEE Delhi Section
5. Industry Relations (IR) Ad-Hoc Committee of IEEE Delhi Section
6. Life Members Affinity (LMA) Group of IEEE Delhi Section
7. Institution of Electronics and Telecommunications (IETE), Delhi Centre
8. Indian Society for Technical Education (ISTE), Delhi Section
9. The Institution of Information Technology Professionals, Safa Society, New Delhi
10. IIPC, AICTE, New Delhi

The Webinar was held on 18th September, 2020 in the benign presence of the dignitaries including Prof. Subrata Mukhopadhyay, Chairperson, Consultants Network Affinity Group and Former Chairperson, IEEE Delhi Section. The webinar was blessed to have inaugural address by Prof. Subrata Mukhopadhyay giving a brief background of the all these webinars in collaboration will all the premiere professional societies, including the latest happenings in the domain of Cyber Security. Prof. R. K. Vyas, National President, CSI welcomed all the invited guests and participants. Prof. M. N. Hoda,

Director, Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi also addressed the session and discussed the background note of conducting such Webinars through virtual platforms.

Dr. Anup Girdhar, CEO, Sedulity Solutions and Technologies, New Delhi, was the lead speaker. He first introduced the topic to the participants. He discussed that we are living in a pure digital age and are fascinated to use IoT devices, Fast Internet speed, Social Networking Sites, e-Governance, etc. The webinar discussed in detail multidimensional issues in protecting computers, servers, mobile devices, electronic systems, networks, online transactions and data from malicious attacks. The webinar also discussed the real-time issues, case studies and mitigation policies.

The session was concluded with Question & Answer round where participants willingly asked their queries, followed by concluding remarks by Prof. Ajay P. Thakare, Chairman, TPPC, IETE, New Delhi. Prof. M. N. Hoda gave his heartfelt appreciation to Dr. Anup Girdhar for his insightful and detailed session. He also thanked all the participants and panellist for giving their precious time for having participated in this webinar and also making all the other webinars hosted by BVICAM, a huge success. The webinar attracted huge participation from across the country and abroad like Saudi Arabia, UAE, Canada, Bahrain, Ethiopia, Maylasia, Qatar, Bangladesh, Spain, etc.

CSI Allahabad Chapter

Reported by Dr. Ratnesh Mishra, Chairman, CSI Pragraj Chapter, U.P., India

Report on Webinar Series-19

Computer Society India Allahabad Chapter organised a Webinar Series 19, hosted by Prof. Ratnesh Mishra (Chairman, Computer Society India Allahabad Chapter) and Prof. Narendra Gupta (Secretary, Computer Society India Allahabad Chapter). Welcome to all participants and speaker by Prof. Ratnesh Mishra (Chairman, Computer Society India Allahabad Chapter). The topic of this program was "An Overview of the Current Landscape of Phishing Attacks in 2020 and Mitigation Strategies" By Ms. Aparna Khare, Sr. Scientist, National Informatics Centre, Lucknow, UP, India. She has discussed about the Current Landscape of Phishing Attacks in 2020, a present-day macroscopic view of cyber attacks related to phishing amidst the covid-19 pandemic. A brief discussion about the approaches and techniques of phishing attacks alongside social engineering will follow some recent case studies about phishing scams that will enlighten the audience about the staggering impact and implications of phishing attacks in today's digital savvy world. The discussion will finally summarize mitigation strategies that can be fruitful against phishing attacks.



Ms. Aparna Khare, Sr. Scientist, NIC, Lucknow, UP

Report on Webinar Series-20

CSI Allahabad Chapter organised a Webinar Series 18, hosted by Prof. Ratnesh Mishra (Chairman, CSI Allahabad Chapter) and Prof. Narendra Gupta (Secretary, CSI Allahabad Chapter). Welcome to all participants and speaker by Prof. Ratnesh Mishra (Chairman, CSI Allahabad Chapter). The topic of this program was "Role of Information Technology in Finance and Economic Growth" By Mr. Rajesh Kumar, (Director & Secretary), Obeetee Private Limited, Civil Lines, Bisunderpur, Mirzapur, U.P. India. He has discussed about the Role of Information Technology in Finance and Economic Growth, first discussed about the uses of information technology; For Individual Time for Morning walk : Count your steps, measure your burnt calories using Fitness apps and bands Breakfast Time: Use YouTube Channels to get ideas of healthy breakfast .For Society (examples): Online Education- Work From Home- Social media like Facebook for communicating and having relationship with others. For Businesses: To support basic information processing tasks. To help with decision making- To Support innovation.- Supports building website for products and services e.g. Data processing for production, inventory, sales, receivables, payables, payroll. Customer Relationship Management, Communication by email etc. So information technology is no more a application of technology to solve business or organizational problems. With time it has become facilitator of life.

Jeff Bezos – Amazon \$195bn-Bill Gates – Microsoft \$121bn, Mark Zuckerberg – Facebook \$99.4bn, Elon Musk – Tesla \$90.3bn, Bernard Arnault – LVMH \$83.7bn, (a French Multinational corporate), First 4 person dominating the list are in IT driven business. Global e-Commerce is selling products and services across geographical borders from the company's country of origin. Growth rate of 265% from \$1.3 trillion in 2014 to \$4.9 trillion in 2021 in e-commerce sales. By 2021 E-commerce sales will account for 17.5% of the total global retail sales. E-Commerce market is expected to grow to US\$200 billion by 2026 from US\$ 38.5 billion as of 2017. Possible because of increase in internet and smart phone penetration. Internet user base to increase to 829 billion by 2021 from 636.73 million in FY19. Govt. begins talks with e-commerce firms like Amazon, Flipkart and snap deal to promote local GI (Geographical Indication) Products. Govt. will also discuss with e-commerce platforms the training and education of sellers of GI products for their listing, shipping as well as export. These include Hand Made Carpet of Bhadohi, Mirzapur Hand Made Dari, Benaras Brocade and Sarees, Darjeeling tea, Lucknow Chicken work, and Kashmiri saffron, to name a few. India has registered 361 GI products, as of March 2020.



Mr. Rajesh Kumar, (Director & Secretary), Obeetee Private Limited

Report on Webinar Series-21

CSI Allahabad Chapter organised a Webinar Series 17, hosted by Prof. Ratnesh Mishra (Chairman, CSI Allahabad Chapter) and Prof. Narendra Gupta (Secretary, CSI Allahabad Chapter). Welcome to all participants and speaker by Prof. Ratnesh Mishra (Chairman, CSI Allahabad Chapter). The topic of this program was "Artificial Neural Network and its Application" Dr. Pragya Dwivedi, Assistant Professor, Department of Computer Science and Engineering, MNNIT, Prayagraj, U.P. India. She has discussed about a neural network that is a system composed of many simple processing elements operating in parallel whose function is determined by network structure, connection strengths, and the processing performed at computing elements or nodes. A neural network is a massively parallel distributed processor that has a natural propensity for storing experiential knowledge and making it available for use. It resembles the brain in two respects: • Knowledge is acquired by the network through a learning process. • Interneuron connection strengths known as synaptic weights are used to store the knowledge. Programme attended by Prof. Ratnesh Dixit, Prof. K.K. Bhutani, Dr. Vijay Agarwal, Mr. Rajkumar, Prof. Sheel Shalini, Mr. Vishal, Dr. S. Kanungo



Report on Webinar Series-22

CSI Allahabad Chapter organised a Webinar Series 22 hosted by Prof. Ratnesh Mishra (Chairman, CSI Allahabad Chapter) and Prof. Narendra Gupta (Secretary, Computer Society of India, Allahabad Chapter). Welcome to all participants and speaker by Prof. Ratnesh Mishra (Chairman, Computer Society of India, Allahabad Chapter). The topic was Blockchain and its Applications and speaker was Dr. S. Venkatesan, Associate Professor, Department of Information Technology, Indian Institute of Information Technology, Allahabad Deoghat, Jhalwa, Allahabad. He has discussed about the block chain; David Chaum first proposed a blockchain-like protocol in his dissertation, 1982. Stuart Haber and W. Scott Stornetta in 1991 described secure chain of blocks. In 1992, Haber, Stornetta, and Dave Bayer incorporated Merkle trees to the design. The first blockchain was conceptualized by a person (or group of people) known as Satoshi Nakamoto in 2008. A blockchain is a distributed database that maintains a continuously growing list of ordered records called blocks. Each block contains a timestamp and a link to a previous block. Since the blocks are cryptographically connected, modification of the data is very less possible. The features of blockchain-Public Verifiability Transparency Integrity Redundancy Trusted. Blocks has header and data portion. Unchanged data portion of one block can be used by another block. Start with the public key bytes (a bytestring of length 64) Of that public key, take the Keccak-256 hash and have a bytestring of length 32. Drop the first 12 bytes. You should now have a bytestring of length 20, the Ethereum address associated with your public key. Generate the blocks Confirm the transactions and include in blocks Get reward (newly generated bitcoin) and transaction fee from the sender. Stake block Block with same number generated by the multiple miners cannot be added in the main blockchain. One block will be added in the main chain others will be the uncle blocks. Rewards will be provided but no transaction fee. Gas Limit. Every operation in the blockchain is allotted a gas value To perform the operation, respective gas will be spent. In case the gas is not sufficient for the operation then it will be dropped. If attacker gives gas limit only for withdrawal not for balance deduction then automatically complete process will be reverted. Gas Fee S.Venkatesan (IIITA). Blockchain Types; Public or Permission less Permissioned Public Permissioned Private Permissioned. Sybil Attack; A node with Multiple Identities. PoW mitigates it. Eclipse Attack; In an eclipse attack, an attacker takes control of all the connections going to and from a targeted victim's node. It stores based on the distance. If it does not find any node then it asks the neighbor. Application of Blockchain-Cryptocurrency, Public Key Infrastructure, Medical Record Management System, Name coin, IoT. Start the question session, this session hosted by Mr. Vijay Pandey and participated by Prafulla Kumar Behera, Govindkm, Mr. Suraj and Dr. Vijay Agarwal, Mr. Kundu Conclude the program by Dr. G. P. Sahu and votes of thanks by Prof. D. K. Dwivedi. Programme attended by Prof. Ratnesh Dixit, Dr. Dushyant Singh

of length 20, the Ethereum address associated with your public key. Generate the blocks Confirm the transactions and include in blocks Get reward (newly generated bitcoin) and transaction fee from the sender. Stake block Block with same number generated by the multiple miners cannot be added in the main blockchain. One block will be added in the main chain others will be the uncle blocks. Rewards will be provided but no transaction fee. Gas Limit. Every operation in the blockchain is allotted a gas value To perform the operation, respective gas will be spent. In case the gas is not sufficient for the operation then it will be dropped. If attacker gives gas limit only for withdrawal not for balance deduction then automatically complete process will be reverted. Gas Fee S.Venkatesan (IIITA). Blockchain Types; Public or Permission less Permissioned Public Permissioned Private Permissioned. Sybil Attack; A node with Multiple Identities. PoW mitigates it. Eclipse Attack; In an eclipse attack, an attacker takes control of all the connections going to and from a targeted victim's node. It stores based on the distance. If it does not find any node then it asks the neighbor. Application of Blockchain-Cryptocurrency, Public Key Infrastructure, Medical Record Management System, Name coin, IoT. Start the question session, this session hosted by Mr. Vijay Pandey and participated by Prafulla Kumar Behera, Govindkm, Mr. Suraj and Dr. Vijay Agarwal, Mr. Kundu Conclude the program by Dr. G. P. Sahu and votes of thanks by Prof. D. K. Dwivedi. Programme attended by Prof. Ratnesh Dixit, Dr. Dushyant Singh



Ghaziabad Chapter Webinars

Reported by **Mr. Saurabh**

Ghaziabad Chapter organized series of webinars recently:

1. "Research Challenge in Computer Science- Emphasis on Geo Spatial Data Analysis perspective"



By Mr. Vivek Saxena (Scientist F, DTRL-DRDO). Event as attended by over 100 research scholars. Patron Mr Saurabh Agrawal gave the opening remarks.

2. Webinar on "Social Networking: An Online Mint" on how social media can be used to generate money. Session was taken by Industry expert Mr. Rajeev Sharma (CEO – NK Tech). President Mr. R K Vyas was the Chief Guest and RVP-I Mr. Arvind Sharma was the Guest of honour.



3. Webinar on "Industry 4.0" covered the current trend of automation and data exchange in manufacturing technologies, including cyber-physical systems, the Internet of things, cloud computing and cognitive computing and creating the smart factory. Session was taken by Mr Nitin Garg (AGM – ALTTC, BSNL). Secretary Mr Gaurav Sharma introduced the speaker and welcomed the participants.
4. Webinar on "How to live stress free life" specially during COVID times was conducted by Mr Naresh Chand Goel (Former GM, BSNL). Event was attended by more than 150 participants. Chairman Prof RPS Tomar introduced the speaker and welcomed the attendees.

Region-IV – Activities

Organized by CSI Region-IV

Reported by Prof. Brojo Kishore Mishra, Department of CSE, School of Engineering & Technology, GIET University, Gunupur-765022, Odisha, India

01. One Week Online Workshop on Internet of Medical Things: Challenges and Solutions (IoMTCS)

17th - 22nd August 2020



One-week online workshop on IoMTCS was conducted by Region-IV, CSI, during 17th - 22nd August 2020. This workshop received 333 participants from various Institutes, Colleges, Universities, Industries and research organizations, including IITs and NITs and shortlisted 250 participants. The workshop was inaugurated by Prof. A K Nayak, Immediate Past President and Chairman, Academic and Awards Committee of Computer Society of India. The webinar was presided by Mr. R K Vyas, President, CSI and attended by Shri Mukesh Kumar, Regional Vice President, Region-IV, CSI, Dr. Brojo Kishore Mishra, Regional Students Coordinator, Region-IV, CSI and Dr. Sanjaya Kumar Panda, Asst. Professor, Dept. of CSE, NIT Warangal and Coordinator of this workshop. The opening address was given by Dr. Sanjaya Kumar Panda, followed by welcome address was given by Dr. Brojo Kishore Mishra, Professor, GIET University, Gunupur. The regional address was given by Shri Mukesh Kumar and the presidential address was given by Mr. R K Vyas. The workshop was inaugurated by Prof. A K Nayak and the inaugural address was delivered by him. The vote of thanks was given by Dr. Sanjaya Kumar Panda.

The speakers for this workshop were Dr. Munesh Singh, Asst. Professor, Dept. of CSE, IIITDM Kancheepuram, Mr. Kalyan Kumar Jena, Asst. Professor, Dept. of CSE, PMEC Berhampur, Dr. Sourav Kumar Bhoi, Asst. Professor, Dept. of CSE, PMEC Berhampur, Dr. Sanjaya Kumar Panda, Asst. Professor, Dept. of CSE, NIT Warangal, Dr. Sanjeet Kumar Nayak, Asst. Professor, Dept. of CSE, Bennett University and Dr. Sangharatna Godbole, Asst. Professor, Dept. of CSE, NIT Warangal. The sessions were theoretical as well as hands on which was useful to the participants. A test was conducted in the last day of the workshop in which 72 participants were cleared the test with 60% score and securing 80% attendance. A feedback session was arranged. The workshop was rated 4.74 out of 5 by the participants. The response from the participants about the workshop is tremendously good and positive and as per the feedbacks they would want to attend such more hands-on workshops further in future.

02. International webinar on "Transformation of Public Sector Organization Through New Generation ERP Technologies"

Date of the event: 21ST September 2020

C. V. Raman Global University, Bhubaneswar, Odisha India, Department of CSE and CSIT, CSI STUDENT BRANCH (CSI SB-CGU)

in collaboration with Computer Society of India (CSI) organized an International webinar on "Transformation of Public Sector Organization Through New Generation ERP Technologies" on September 21, 2020.



The Webinar began in the benign presence of our Chief Guest for our event Prof. A.K.Nayak, Immediate Past President, CSI Chairman, Academic& Awards Committee, CSI and Guest Of Honor Shri Mukesh Kumar, Regional Vice President CSI Region-IV, General Manager &I/C Control & Automation SAIL,CET Ranchi. The webinar began with the welcome address by Dr. Sukant Kishore Bisoy,HOD,CSE,CGU welcoming all the guests and participants. Prof. A.K. Nayak addressed the session and discussed the background note of conducting such Webinars and he also encouraged all of us by his motivational words. Shri Mukesh Kumar also shared his Industrial Experience and new emerging ideas of Technologies. Following which our Speaker of the event JAGAMOHAN PADHYA, Technical Quality Manager/Solution Architect at SAPIreland,Master in Management from Smurfit UCD, Dublin, who has 13+ year experience in this field discussed the ERP solutions' impact in digital era and its Transformation with New Generation Technologies with Q/A round with all the participants. The successful International webinar ended with the vote of thanks given by Ms. ANJANA MISHRA, Coordinator, CSI SB CGU with the words that soon conduct the next webinar will conduct because we will never stop learning, regardless of any difficult scenarios.

03. Started a Webinar Series on Current Topics on Computer Science, from CSI Region IV for Students, Faculties, Researchers, Academia, and Society.

Date of the event: 27th September 2020



Contd. on pg. 57

Divisional Activities

Division - IV (Communication)

INDIAN INSTITUTE OF BUSINESS MANAGEMENT, PATNA

ORGANIZES ONE DAY WEBINAR ON

"Effective Business Continuity Planning Through Knowledge Management & IT"

WITH TECHNICAL COLLABORATION OF

COMPUTER SOCIETY OF INDIA, DIVISION IV (Comm)

OPENING ADDRESS



Prof. A K Nayak
Immd Past President and chairman academic & awards committee, CSI

INAUGURAL ADDRESS



Prof Dilip Chandra Nath
Vice Chancellor
Assam Univ (Central Univ), Silchar

PRESIDENTIAL ADDRESS



Prof A K Saini
Vice President
Computer Society of India

E-Certification
*Only For Fulltime Attendees

KEY NOTE ADDRESS



Dr. Pratosh Bansal
Director DDE &
Internal Quality Assurance Cell
Devi Ahilya Vishwavidyalaya, Indore

KEY NOTE ADDRESS



Dr. R N Behera
Sr. Technical Director (retd.)
National Informatics Center,
NIC, Odisha

INVITED ADDRESS



Mr. Abhishek Kr Singh
Global Director Technology
BCG (Boston Consulting Group)

INVITED ADDRESS



Dr. Santosh Kr. Sinha
Executive Director
Bihar Industrial Area Development Authority

INVITED ADDRESS



Dr. B Chidamberarajan
Chairman, DIV IV (Comm)
Computer Society Of India

06 Sept 2020 12:00 NOON

ORGANISERS

REGISTRATION LINK 
<https://tinyurl.com/6septwebinar>

Prof Rohit Kumar
Asst professor ,IIBM
 7903269648

Prof Shams Raza
Regional vice President
Region II, CSI

Prof Gopal Krishna
Bihar State Student Coordinator
Computer Society of India

Prof Ganesh Panday
Dy Director ,IIBM
 8210693408

One Day Webinar was organised by Indian Institute of Business Management in collaboration with CSI Division-IV (Communication) on 6th September, 2020 on the theme "Effective Business Continuity Planning through Knowledge Management and IT". The webinar was inaugurated by Prof. Dilip Chandra Nath, Hon'ble Vice Chancellor of Assam University (Central University), Silchar and opening address was delivered by Prof. A. K. Nayak, Immd. Past President and Chairman Academic and Awards Committee, CSI.

The function was presided by Dr. A. K. Saini, Vice President of CSI in which Dr. B. Chidamberarajan, Chairman CSI Div. IV (Comm) had participated as the Guest of Honour. In his keynote address Dr. Pratosh Bansal, Director DDE & Internal Quality Assurance Cell, Devi Ahilya Vishwavidyalaya, Indore highlighted about the various factors for the effective business planning and its sustainability. The another keynote speaker on this occasion, Dr. R. N. Behera, Sr. Technical Director (Retd.) National Informatics Center, NIC, Odisha discussed in detail about the role of Artificial Intelligence and Business Intelligence

for driving the Business Planning more effective and productive. Participating in the webinar as the Invited Speakers Mr. Abhishek Kr. Singh, Global Director, Technology BCG (Boston Consulting Group) and Dr. Santosh Kr. Sinha, Executive Director, Bihar Industrial Area Development Authority presented their lectures through PPT presentation detailing about various tools and technics adopted by the Business, Industry and Service Organisations along with the use of knowledge management and Information Technology to make business sustainable, reliable and durable for longer span of time. The concluding remark was given by Prof. Shams Raza, Regional Vice President, Region-II of CSI and the vote of thanks was presented by Prof. Ganesh Panday, Convenor of the webinar and Dy. Director of Indian Institute of Business Management, Patna. The webinar was hosted by Prof. Rohit Kumar of IIBM, Patna and Prof. Gopal Krishna, the Bihar State Student Coordinator of Computer Society of India. The webinar was attended by more than 300 no. of participants from different part of the country and abroad.

Divisional Activities

Division - V (Education & Research)

One Day International Webinar was organised by Indian Institute of Business Management in collaboration with CSI Division-V (Education & Research) on 27th September, 2020 on the theme "Tools and Resources in E-Learning". The webinar was inaugurated by Prof. A. K. Nayak, Fellow, Immd. Past President and Chairman Academic and Awards Committee, CSI. In his inaugural address Prof. Nayak said about the importance and growing demand of E-Learning particularly for providing the effectiveness in the pandemic period of COVID-19. He further told that the tools and technics adopted in the E-Learning process will be at the center point of the education 4.0. Prof. Nayak expressed his concern that in spite of 74 years after the independence, the country could not be able to achieve the complete literacy but he was quite positive that the e-Learning shall be the instrumental factor for providing education to all in the future days to come.

Participating as the Guest of Honour, Dr. D. D. Sarma, Chief Scientist (R) CSIR - NGRI, Hyderabad elaborated upon the types and kinds of advancement and researches are being conducted through out the world which will drive the society to achieve the new scale of height in the learning and teaching process. In his keynote address Prof. R.

R. Deshmukh mentioned about the various facilities and contents are available in MOOC, NPTEL, SWAYAM Projects etc. provided by the Govt. of India along with several tools and facilities are available from the private parties. Speaking on this occasion Prof. Dr. Nilesh Kr. Modi, Professor and Director, Dr. Babasaheb Ambedkar Open University, Ahmedabad, Gujarat said that, "How e-Learning Process is enhancing the standard of Teaching and Learning Process in general and Open and Distance Learning in particular".

The function was presided by Mr. R. K. Vyas, President, CSI. The webinar was also addressed by the Chairman Div.V (Education and Research) of CSI Dr. Subhash Chandra Yadav, Professor and Head, Dept. of Computer Science & Tech. Central University, Jharkhand. The concluding remarks and vote of thanks was given by Prof. Shams Raza, Regional Vice President, Region-II of CSI. The function was coordinated by Prof. Ganesh Panday, Dy. Director of Indian Institute of Business Management, Patna and hosted by Prof. Rohit Kumar of IIBM, Patna and Prof. Gopal Krishna, the Bihar State Student Coordinator of Computer Society of India. Mr. Surojit Dutta, Teamasek Polytechnic, Singapore has also graced the function as the Invited Speaker.



Contd. from pg. 55

Webinar 1 Topic: "Cyber Physical System for Smart Applications"

- Number of participants given responses: 150+ responses from different part of country.
- Inaugural Dignitaries Present: SSC-CSI Odisha, RSC-CSI Region IV, RVP-CSI Region IV, and NSC-CSI
- Coordinated by – SSC-CSI Odisha, RSC-CSI Region IV

Webinar 2 Topic: "Diabetes Prediction Using Machine Learning"

Date of event : 30th September 2020

- Number of participants given responses: 83+ responses all over the country.
- Inaugural Dignitaries Present: SSC-CSI Odisha and RSC-CSI Region IV
- Coordinated by – SSC-CSI Odisha, RSC-CSI Region IV


**Computer Society of India
Region - IV**
 Presents free Webinar-02
 on
**Diabetes Prediction Using
Machine Learning**
 30th September 2020
 7:00 PM EST
 Registration Link:
<https://tinyurl.com/CSIODISHA>
 For any query, please feel free to contact
Dr. Sourav Kumar Bhoi
 State Student Coordinator, Computer Society of India
 Assistant Professor (CSE), PMEC, Berhampur, Odisha
 Mob: +91-9796018390, Email: estregion4odisha@gmail.com

STUDENT BRANCHES INAUGURATION REPORTS

R. N. G. PATEL INST. OF TECHNOLOGY, SURAT (REGION-III)

Reported by **Prof. Dharmishta R Chaudhari**, R. N. G. Patel Institute of Technology

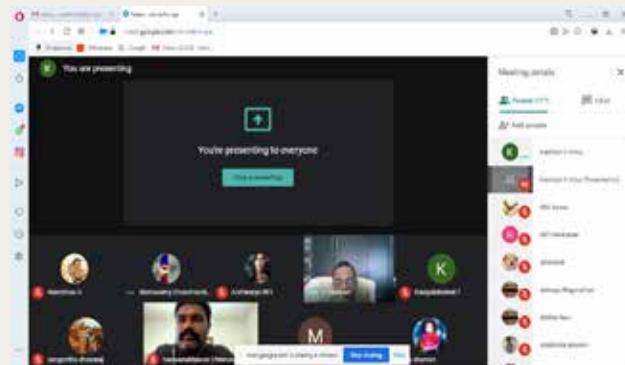


R. N. G. Patel institute of Technology (RNGPIT) at Bardoli, Gujarat inaugurated CSI Student Branch on 7th September 2020.

Computer Science and Engineering department of RNGPIT institute has organized 6 Days STTP on "Practical Approach towards Modern Mobile Application Development" from 7.9.2020 to 12.9.2020 under the banner of CSI. The CSI Student Branch at CSE department, RNGPIT was inaugurated by Dr. Nitin Oza, Ex. Chairman of CSI Student branch and Managing Director of Surat Presstech Pvt. Ltd. and it was graced by chairman of Surat IT Company Owners (SICO) Mr. Ashish Dhameliya. Dr. Latesh B. Chaudhari, Principal of RNGPIT provided introductory speech about various technical activities conducted by institute during current year. Dr Nitin Oza inaugurated the CSI Student branch and provided the details about CSI and CSI student branch benefits. Dr Nitin has motivated the students to participate in various technical activities governed by CSI. He added "As 250 Chinese applications has recently banned by Indian government, students can have their own start-up for "Atmanirbhar Bharata". He also added that CSI works to fulfil gap between industry and academia and told students to take benefits of selecting project definition, career guidance, downloading study material, Publications, participation in various competitions through CSI. Dr. Madhavi B. Desai, Head-CSE has provided the brief idea about various activities conducted under the banner of CSI. Total 101 students of RNGPIT are members of CSI student branch and 11 faculties of Computer Science & Engineering department are active members of CSI. More than 250+ participants were present in inauguration of the programme. The programme was enlightening and inspiring for participants.

KONGUNADU COLLEGE OF ENGINEERING & TECHNOLOGY, THOTTIAM, TRICHY (REGION-VII)

Reported by **Dr. J. Yogapriya**, SBC, Kongunadu College of Engineering & Technology



Kongunadu College of Engineering and Technology, Thottiam, Trichy have organized CSI Inauguration for the Academic year and one day seminar on entitled "Industry Standard Enterprise Networking & TCP/IP " on 8th Aug 2020 via Google Meet. The students belonging to the Department of CSE & IT of the college has participated in this event. Dr PSK R Periaswamy, Chairman of Kongunadu Institutions has presided over the function. The event started with the welcome address delivered Ms K Aishwarya Final year CSE. Dr R Asokan, has given the Principal address and addressed the students about the importance of Conducting Online Program during this lockdown and motivated students to participate in more activities. Dr J Yogapriya has given the Felicitation address and motivates the students to improve their technical knowledge and do more projects in Networking. Mr Chandrasekar Ramasamy Senior Network Consultant, Technology Solution Network- Enterprise Data & Managed Services, Nanyang Technological University, Singapore, was the chief guest for this Seminar. The chief guest explained the latest Trends in Networking, What Industry need from you, started with the basics of networking, Enterprise Networking and network automation has done by the resource person and results were shown to faculty members and students. The end of the seminar consisted of hands on Practice session and interactive small group of plenary discussions with feedback session. The event concluded with vote of thanks given by Mr M Atchaya, Final Year, Computer Science and Engineering Department.

STUDENT BRANCHES INAUGURATION REPORTS

BABU BANARASI DAS INST. OF TECH. AND MANAGEMENT

Reported by **Mr. Diwakar Tripathi**, President at CSI BBDITM Student Council



CSI BBDITM Student Council of Department of Computer Science and Engineering and Department of Information Technology organized Inauguration Ceremony of CSI Student Branch of BBDITM on the auspicious occasion of Teacher's Day on 5th September 2020. Under the guidance of our Director, Prof (Dr.) Bhavesh Kumar Chauhan; our Patron, Dr. Manuj Darbari; CSI Branch Coordinator, Dr. Diwakar Yagyasen and Branch Counsellors, Mr. Zulfikar Ali Ansari & Mr. Shadab Siddique, the council organized the event to congratulate and familiarize the new member of CSI BBDITM Team from every year and branch. The event was graced by the presence of

- Prof. A. K. Nayak, Immediate Past President, Academics and Award Committee Chairman, CSI;

- Mr. R. K. Vyas, President, CSI;
- Mr. Arvind Sharma, Vice President Region-1, CSI;
- Dr. Pankaj Kumar Goswami, Chairman, CSI Lucknow Chapter;
- Mr. Vinay Kumar Johri, Hon. Secretary CSI Lucknow Chapter.

The promotion poster was released to announce to everyone that our college finally is a Student Branch along with the details about the inaugural event. On 5th September, after sharing formal greetings and wishing each and every faculty present a Happy Teacher's Day we went on ahead with the event. The event was hosted on zoom and was live broadcasted on YouTube simultaneously.

The anchors welcomed our guests and introduced them to the audience followed by a online presentation showing all the achievements and past activities of CSI BBDITM Student Council to our newly joined team members. Afterwards the Convener Dr. Bhavesh Kumar Chauhan, Director BBDITM, gave a welcome speech to the audience and guests. The official Inauguration was then commenced by Prof. A. K. Nayak followed by his inaugural address in which he talked about the importance of Teacher's Day and then the role of a community among students. Following him, Mr. R.K. Vyas gave his presidential address to the audience and thanked all in attendance for becoming a part of CSI. Guest of Honour- Mr. Arvind Sharma shared with the audience his valuable experience followed by Dr. Pankaj Kumar Goswami who reiterated the role a community plays in a student's life along with various career paths available to the current generation. Lastly Mr. Vinay Kumar Johri addressed everyone and congratulated the audience members on becoming a member of CSI and congratulated the college on becoming a student branch. At last the anchors invited our Chair Patron, Dr. Manuj Darbari who gave the vote of thanks to all the distinguished guests and CSI Officials and then our Student Branch Coordinator Dr. Diwakar Yagyasen concluded by thanking the CSI administration for their great cooperation and their partnership as a student branch. The anchors thanked every audience member for their patience and support and the event ended.

The feedback of the event was overwhelmingly positive with great enthusiasm amongst the members for future events. With this we concluded the Inauguration of CSI BBDITM Student Branch. About 370 students, faculty members and CSI Office bearers from BBDITM and also from other colleges attended our inaugural function.

CHAPTERS REPORT

CHENNAI CHAPTER

Reported by Dr. A. Prema Kirubakaran, Hon. Secretary, CSI Chennai Chapter

The CSI Chennai Chapter organised the following webinar events jointly with ACM Chennai and IEEE CS Madras during 11th Aug – 22nd Sep 2020.

Webinar on "Demystifying Hadoop & Map Reduce" by Dr. Haleema and Mr. Basheer Ahamed Fazal, Engineering Manager, Freshworks, Chennai on 11th Aug from 6 p.m. to 7 p.m.

This webinar gave an overview of Big Data & Big Data Analytics and explained how business can benefit from Big Data Analytics. Mr. Basheer covered topics on characteristics of Big Data, how businesses can benefit from Big Data Analytics, Hadoop Ecosystem tools. Dr. Haleema covered the topics on Hadoop Master - Slave architecture, stages in executing a MapReduce Job followed by a handson session on Eclipse IDE for Java and Cloudxlab for Hadoop comprising writing MapReduce code for finding the word count and writing MapReduce code for identifying city-wise min-max temperature.

Link to the presentation : Slides: <https://bit.ly/3goIRer>

Video recording: <https://bit.ly/2Cs9hy4>

(Duration: 2 Hours 17 Minutes , File Size: 719 MB)

Webinar on "Game Based Education and Learning" by Mr. Kartic Vaidyanathan, Founder of LetsPlayToLearn (www.letsplaytolearn.com) on 15th Aug from 6 p.m. to 7 p.m.

Despite the low cost, high-quality learning content availability learners and trainers struggle with learning effectiveness. In this context, this webinar discussed in detail about the play and game-based learning intervention that facilitated the flow / happiness state helping the learners stay away from anxiety and boredom apart from enabling peer learning and social-emotional skills.

Link to the presentation : Slides: <https://bit.ly/32iEGw1>

Video recording: <https://bit.ly/2EiC5df>

(Duration:1 hour 20 minutes. File size: 474 MB)

Webinar on "Data Analytics Using R" by Mr. P. V. Subramanian, Visiting Faculty, Great Lakes Institute of Management, Chairman, CSI Chennai Chapter on 18th Aug from 6 p.m. to 7 p.m.

This webinar dealt in detail topics such as Overview Data Analytics(DA), what is DA, why DA, DA framework, Roles in DA field, applications of DA. Various tools used in DA were also discussed. Demo of tools, Rcmdr, PSPP and KNIME were shown. This was followed by a session covering overview of R, demo of the use cases in R including web scrapping, web development, MySQL database access. The webinar illustrated how to build predictive analytics model to predicting heart disease using R.

Link to the presentation slides: <https://bit.ly/3ldhRCz>

Video Link: <https://bit.ly/3heeetw>

(Duration: 1 hour 26 minutes. File size: 303 MB)

In association with Cambridge Association English, IEEE CS Madras, ACM Chennai and CSI Chennai chapters conducted a **webinar on "Gain the skills required to excel in your career"** by Ian Cawley,

Cambridge, UK on 20th Aug from 6 p.m. to 7 p.m.

The webinar focussed on how to prepare an effective Curriculum Vitae (CV) and how to hone interview skills which are useful across all employment sectors.

Video Link: <https://event.webinarjam.com/t/click/nk02xc16tzqclotrggckkt6ys4>

Webinar on "5G: The Game Changer, from myth to reality" by Mr. Gautam Hazari, Technical Director, GSM Association, UK on 22nd Aug from 6 p.m. to 7 p.m.

This webinar covered topics Comparison of 3G, 4G & 5G, requirements for 5G, 5G service enablers, 5G New Radio, 5G Core Network, 5G Global Launch, 5G Network slicing, 5G Multi-access Edge computing, 5G Centre of Heterogeneous Network, 5G Spectrum, 5G Deployment options, 5G Service Tiers, 5G Use case families, 5G and health concerns and Contribution of 5G to Global Economy.

Link to the presentation slides: <https://bit.ly/3mdNxbb>

Video recording: <https://bit.ly/3igljdD>

(Duration 1 Hour 28 minutes. File size: 687 MB)

Webinar on "Enhancing Web Applications Using Angular JS and React" by Mr. A. Senthil Nayagam, Chief Technology Officer Agira Technologies and Mr. S. Gurumoorthy, Senior Software Engineer Agira technologies on 25th Aug from 6.00 p.m. to 7.00 p.m.

The webinar explained how to achieve speed and sleekness of websites by moving to front-end frameworks Angular JS & React, comparison of Angular & React, Data binding in Angular and VirtualDom in React followed by a demo of Angular JS and React application.

Link to the presentation slides: <https://bit.ly/3jEChTj>

Video recording: <https://bit.ly/32DCWxl>

(Duration: 1 hour 31 minutes, File Size: 600 MB)

Webinar on "Panel Discussion on Online Education Challenges in Assessment and Open Book Examinations" held on 27th Aug from 6 p.m. to 7:30 p.m. Panel members consist of Prof. S Sadagopan, Director, IIIT Bangalore, Prof. NJ Rao, Former Prof. & Chairman, CEDT & Dept. of Management Studies, IISc, Bangalore, Dr. M Sasikumar, Executive Director, CDAC, Head, Educational Technology Dept., Mr. Janardhan Santhanam, Global Head, Talent Development, TCS. Panel was moderated by Prof. CR Muthukrishnan, Former Deputy Director & Prof. of CSE, IIT Madras.

Link to the presentation slides:

Prof. CR Muthukrishnan: <https://bit.ly/2RfzKCS>

Prof. S Sadagopan: <https://bit.ly/2Fj17tl>

Prof. NJ Rao: <https://bit.ly/2GQz9Wk>

Dr. M Sasikumar: <https://bit.ly/32gXZ9W>

Video Link: <https://bit.ly/3m4sMia>

(Duration: 2 hour 15 minutes. File Size: 1.08 GB)

Webinar on "Landscape of Practical Blockchain Systems and their Applications" by Dr. C. Mohan, Distinguished Visiting Professor (Tsinghua Univ), Honorary Advisor (TNega), Retired IBM Fellow on 29th Aug from 7:30 p.m. to 8:30 p.m.

CHAPTERS REPORT

The webinar focussed on adoption and adaptation of the underlying technology of public Bitcoin cryptocurrency network for use in the private or permissioned environments. The speaker, Dr. C Mohan described some use-case scenarios, especially those in production environment. The webinar also explained the landscape of private blockchain systems with respect to their architectures in general and their approach to some specific technical areas and opportunities & challenges.

Link to the presentation slides: <https://bit.ly/2D89x5F>

Video Link: <https://bit.ly/2F0Etpe>

(Duration: 1 hour 58 minutes. File Size: 498 MB)

Webinar on "Effective Presentations using Outlines in PowerPoint" by Mr. Geetesh Bajaj, Microsoft PowerPoint MVP, Board Director of the Presentation Guild Technical Specialist at the Presentation Summit, Head of Indezine.com on 1st Sep from 4.30 p.m. to 5.30 p.m.

The webinar explained how to create effective and better presentations using sound outlining principles followed by a demo.

Link to the presentation slides: <https://bit.ly/3i0qHBs>

Video link: <https://bit.ly/2QXfzJR>

(Duration 1 hour 12 minutes. File size: 251 MB)

Webinar on "Machine Learning for non-Coders: Your turn to become a ML Expert" by Dr. Rik Das, ACM Distinguished Speaker, Assistant Professor, Program of Information Technology, Xavier Institute of Social Service, Ranchi on 5th Sep from 6 p.m. to 7 p.m.

This webinar covered the aspects for embracing machine learning by non-coders from different backgrounds having an eye for detail. Two popular open-source tools, Weka and Orange were demonstrated.

Link to the presentation slides: <https://bit.ly/3iysC0e>

Additional Notes: <https://bit.ly/3iJIKMs>

Video recording: <https://bit.ly/3mnFc4P>

(Duration: 1 hour 41 minutes. File Size: 369 MB)

Webinar on "IEEE Standards Overview" by Mr. Munir Mohammed, Sr. Program Manager, IEEE Standards Association, Bangalore on 8th Sep from 6 p.m. to 7 p.m.

The webinar covered an overview of some popular IEEE standards and the initiatives of IEEE Standards Association & IEEE Standards University.

Link to the presentation slides: <https://bit.ly/2GYDNBG>

Video link: <https://bit.ly/2RnynSz>

(Duration 1 Hour 26 minutes. File size: 487 MB)

Webinar on "Artificial Intelligence in Modern Power and Energy Systems" by Dr. Mostafa Farrokhabadi, Sr Director (Technology), BluWave-ai, Ottawa, Canada on 12th Sep from 6 p.m. to 7 p.m.

This webinar discussed the use of artificial intelligence (AI) in modern power and energy systems, electrical distribution networks. Real-world examples of the use of AI for energy storage systems optimization and control were provided and discussed.

Webinar on "Data Visualisation and Qlik Sense Demo" by Mr. Pankaj

Muthe, Academic Program Manager (Asia Pacific) Qlik on 15th Sep from 6 p.m. to 7 p.m.

This webinar covered various topics such as defining data visualization, exploring types of visualizations, history and evolution of data visualization, psychology of human perception followed by Qlik Sense demo showing how data can be visualized, insights can be revealed, patented features such as "power of grey" and "associative data engine".

Link to presentation slides: <https://bit.ly/2EnYPsy>

Video link: <https://bit.ly/2RzSsFB>

(Duration: 1 hour 13 minutes. File Size: 261 MB)

Webinar on "The Framework for Lifetime Employability and Successful Leadership" by Mr. Dileep Srinivasan, Founding Partner & CEO of PowerFluence, Co-author of the book "Achieving Lifetime Employability" on 19 Sep from 6 p.m. to 7 p.m.

The webinar explained the importance of 4 P's (Principles, Performance, Perception and Politics) that every successful leader and employee needs to follow and adopt. The webinar also introduced the House of Leadership Framework that covers ten specific Quotients across 3 elements: the Foundation Layer comprising Intelligence Quotient IQ, Emotional Quotient EQ, and Learning Quotient LQ; the Supporting Pillars covering Networking Quotient NQ, Execution Quotient XQ, Industry Quotient InQ, and Digital Quotient DQ; and finally the Roof consists of Marketing Quotient MQ, Political Quotient PQ, and Style Quotient SQ.

Link to the presentation slides: <https://bit.ly/3kDulSy>

Book summary link at <https://bit.ly/32OlaI3>

Video link: <https://bit.ly/3kAbCYo>

(Duration 1 hour 10 minutes File size: 249 MB)

Webinar on "Academic Document Creation Using LaTeX" by Dr. A. Neela Madheswari, Professor, Dept. of Computer Science and Engineering, Mahendra Engineering College, Namakkal, Tamilnadu, India on 22 Sep from 6 p.m. to 7 p.m.

The webinar explained the basic features of LaTeX including basic symbols, formula, tables, figures, commands, comments, lists and demonstrated them along with document and slide preparation demo using the LaTeX editors Kile and Overleaf.

Link to the presentation slides: <https://bit.ly/362p08v>

Video link: <https://bit.ly/3cp40db>

(Duration 1 hour 41 minutes File size: 357 MB)

Mr. PV Subramanian, Chair, CSI Chennai welcomed the participants and introduced the speakers in all the above events except 3, 4 & 7. Mr. HR Mohan, Past President, CSI and Chair, ACM Chennai welcomed the participants and introduced the speakers in the events 4 & 7 and also moderated the Q&A and presented concluding remarks in all the events except 4 & 7. Dr. P Sakthivel, Division II Chairperson, CSI and Chair IEEE CS Madras welcomed the participants and introduced the speaker in the event 3 and presented concluding remarks in the event 7. These webinars were well attended, and the participants felt the events were timely, interactive, and found the content relevant, interesting, useful.

CHAPTERS REPORT

COIMBATORE CHAPTER

Reported by Mr. N. Duraiswamy, Hon. Secretary, CSI Coimbatore Chapter



Tamil Nadu Engineering Admissions Counselling (TNEA) online process for the academic year 2020-2021 has commenced and students have already submitted their applications and got their certificates verified. The CSI, Coimbatore Chapter organized a guidelines session for aspirants on 16th August (Sunday) through webinar. Dr. G Radhamani, Chairperson, CSI Coimbatore Chapter welcomed the gathering.

Dr. P Narayanasamy, Dean, Networking, PSG College of Technology and former secretary of TNEA detailed on the Tamil Nadu Engineering Admissions Counselling (TNEA) online process. This was followed by a presentation by Dr. T Purushothaman, Secretary, TNEA for this year, on the process of exercising the choices of branches and the institution, starting from the stage of ranking list publication. CSI Coimbatore Chapter is organizing this programme for the 16th consecutive year. In this year, due to COVID 19, CSI has conducted this event for the whole of Tamil Nadu through webinar in association with PSG College of Technology. Dr. K Prakasan, Principal, PSG College of Technology delivered the presidential address, motivating the students to pursue their passion. This session registered an overwhelming response of more than 200 students and parents.



After the presentation, during the interactive sessions, the Professors of PSG College of Technology, Dr. R Vidhyapriya, Dr. Ramamoorthy, Dr. Vinod, Dr. V Prabhu Raja and Dr. R Natarajan along with Dr. P Narayanasamy and Dr. T Purusothaman answered all the questions

raised by the participants. Dr. N Alamelu, Immediate Past Chairperson, Coimbatore Chapter was the Moderator of this event. Mr. N Duraiswamy, Hon Secretary, Coimbatore Chapter proposed the vote of thanks and concluded the meeting

An initiative of CSI Coimbatore Chapter to provide a platform for its Student Members to interact and share knowledge with peer student members of all colleges conducted two events on 3rd September 2020

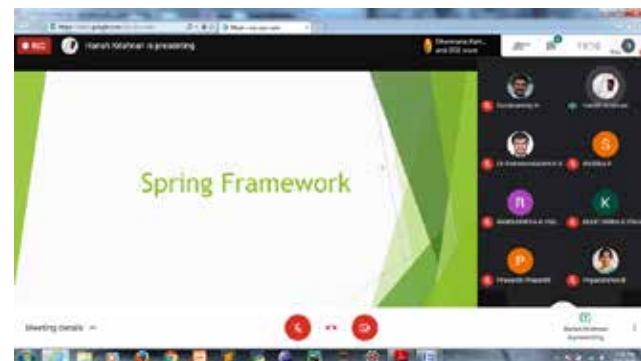
Topic : Spring Framework. Speaker : Mr. Harish K, Final Year, B.E (CSE), KPR Institute of Engineering and Technology, Coimbatore.

Topic : Smart IOT Applications in Education. Speaker : Ms. Nivetha R, 2nd year, M.Sc. (IT), PSGR Krishnammal college for Women, Coimbatore

The Management Committee Member of CSI Coimbatore Chapter, Dr. R S Somasundram welcomed all the participants and introduced the Student Speakers.

Spring Framework

In the first session, a brief introduction on spring framework was given to the participants. PPT presentation on Spring Boot and its features were explained. Object Relational Mapping tools were unfolded to the members of the meeting. A short note on Annotations, Spring Security and how to replace java with spring were deciphered.



A demo on Spring application was delivered. Initially a demonstration on how spring framework works was given. The working of Dependency Injection was shown. This app is totally based on XML configuration. Clear explanation on how to transfer dependency from maven repository to XML configuration was delivered. This application compulsorily requires internet connection for its creation and working. This app doesn't support JSP page directly, so include tomcat jasper from maven repository to XML configuration. JSP page was then created to show how data were imported from the backend.

Smart IOT Applications in Education

The second session started with the Definition of IoT - A dynamic global network infrastructure with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual "things" have identities, physical attributes and virtual personalities and use intelligent interfaces and are seamlessly integrated into the information network."

CHAPTERS REPORT



History of IoT and the various Components of IoT were also discussed. This session highlighted on the Applications of IOT in Education with Smart Classroom, Smart School Bus and Students attendance system using RFID.

The session was an eye opener to the researchers and the students. Both the sessions were interactive with vibrant participants. Mr. N Duraiswamy, Hon Secretary, CSI Coimbatore Chapter proposed vote of thanks.

KANCHEEPURAM CHAPTER

Reported by Dr. M Senthil Kumar, Hon. Secretary, CSI Kancheepuram Chapter



To create awareness in the current scenario of the impending pandemic Corona, CSI Kancheepuram Chapter, in association with Division-IV Computer Society of India, organized a National Level webinar titled 'Understanding Covid-19 (A Social Awareness)' on 11th September 2020. The event was inaugurated with a welcome address by Dr. M Senthil Kumar, Hon Secretary, Kancheepuram Chapter, and felicitated by Dr. B Chidhambararajan, Chairman Division –IV, CSI. The Guest of honor was Prof. A K Nayak, Immediate Past President & Chairman Academic & Awards committee, CSI.

The event was conducted as two sessions. The first session was handled by Dr. P Kuganantham, HOD, Social Medicine & Infectious Diseases, SIMS Hospital, Chennai. He gave an insight about Covid-19 and explained the precautions required. Ms N Laxmipriyadarshini, Chief Nutrition & Dietetics, SRM Medical College Hospital & Research Centre, Kattankulathur, handled the second session, and gave a diet chart for prevention of corona.

The Participants got clear insights about the prevention and

immunity boosting food items from this session. They interacted with the guest speakers and cleared their doubts regarding covid-19. During this event, more than 500 attendees comprising of students, faculties and professionals from various sectors from all over India participated and had the opportunity to know about the current pandemic situations and deterrent measures against Covid-19. At the end, Ms S Sandhya, Member of Nomination Committee, Kancheepuram Chapter, proposed a vote of thanks. The event was organized under the guidance of Dr. Rajeswari Mukesh, Chairman, CSI Kancheepuram Chapter.

RAJKOT CHAPTER

Reported by Dr. Ashwin Dobariya, Vice Chairman, Rajkot Chapter

CSI Rajkot Chapter organised a online Technical Session on Programming in C on 12th September 2020. Total 90+ students registered. The session was started with welcome speech by Prof Darshita Pathak, Lecturer, Computer Dept, AVPTI.

After the welcome speech, Dr Ashwin Dobariya, Associate Prof, FCA, MU has started the session on Programming C. He covered the main topic of UDF & the concept of Structure and Union. He explained the fundamental concepts of UDF and various examples of UDF based on built in string functions with live program demonstration. In the second part of the session, he explained the concept of Structure and Union of C Language. At the end of session, there was an online Quiz based on session and students enjoyed the session and quiz. The session was ended with the thanks speech by Prof Darshita Pathak. Overall arrangement was done by Prof Hiren Savaliya, Lecturer, Computer Dept, AVPTI & Coordinator CSI Committee, AVPTI. E-certificate has been given to all the participants.

This session was planned under the guidance of Dr R Sridaran, Dean, FCA, MU & Chairman, CSI Rajkot Chapter & Prof Hemali Rupareliya, HoD, Computer Dept, AVPTI , Rajkot.



This online Quiz Competition on Gandhi Jayanti & Swachh Bharat Abhiyan was organized on 2nd October 2020 by CSI Rajkot Chapter and NSS – FCA Committee, Faculty of Computer Applications, Marwadi University, Rajkot. Total 185+ online registration received for this event and actively participation in the quiz competition. It was organized as a part of celebrating 151st Gandhi Jayanti this year.

At the beginning of the competition, the welcome speech was given by Dr R Sridaran, Dean, FCA, MU and Chairman – CSI Rajkot Chapter. The overall event was managed by CSI & NSS committee members Dr Ashwin Dobariya, Dr Brijesh Jajal, Prof Amit Gohel, Prof Radha Raval & Ms Kinjal Bhatt. Students also learn virtues and thoughts of Mahatma Gandhi and importance & responsibility about Swachhata Bharat Abhiyan as a responsible citizen of country.

At the end of Quiz, Dr Brijesh Jajal has announced the top three rankers of the quiz and Dr Ashwin Dobariya, Vice Chairman, CSI,

CHAPTERS REPORT

Rajkot Chapter has expressed sincere thanks to all participants for their actively participation in Quiz and committee members for overall support to make this event success.

Congratulation to the students who secured top-3 Position:

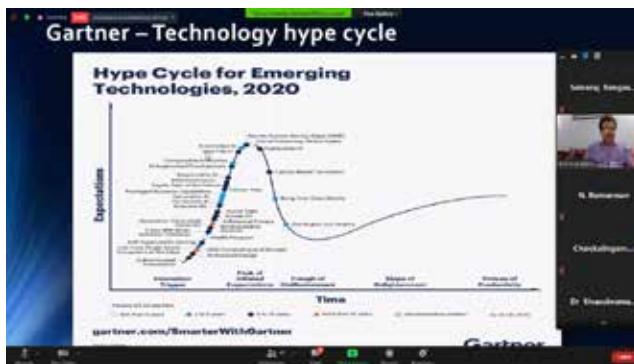
1st Rank: Shivani Bhatt

2nd Rank: Jiten Dholakiya

3rd Rank: Shilva Fefar

TIRUCHIRAPPALLI CHAPTER

Reported by **Mr. D. Senthil Kumar**, Hon. Secretary, CSI Tiruchirappalli Chapter



CSI Tiruchirappalli Chapter organized the event on Kick start your career in Mobile Robotics on 18th August 2020. The speaker for the event was Mr. Muthu Vengaliappn, CEO & CO Founder, Katomaran Technology & Business Solutions. Webinar commenced with the welcome address by Mr. N Rajasekaran, Vice-Chairman, CSI, Tiruchirappalli Chapter. Speaker Mr. Muthu Vengaliappn explained various practical applications of Robotics implemented including effective selection of Controllers, Motors, Sensors etc. for the

benefit of Students. Mr. A Anand, Executive Committee Member CSI Tiruchirappalli Chapter proposed Vote of Thanks. Around 50+ participants got benefitted

The Chapter has organized a Webinar on Distributive Technologies and Data Science Case Studies on 8th September 2020. The speaker for the event was Er Bohitesh Misra, CO-Founder, Advisor, Xiphias Xpay Life Pvt Ltd, Bangalore. Dr. N Kumaresan, Chairman, IEI TLC Welcomed the gathering. Er R Selvaraj, Chairman, CSI Tiruchirappalli Chapter introduced the speaker to the Audience. The Speaker Mr. Misra narrated the latest trend in Distributive technologies. Dr. Nickolas, Professor - Dept of CS-NIT, Tiruchirappalli proposed vote of Thanks.

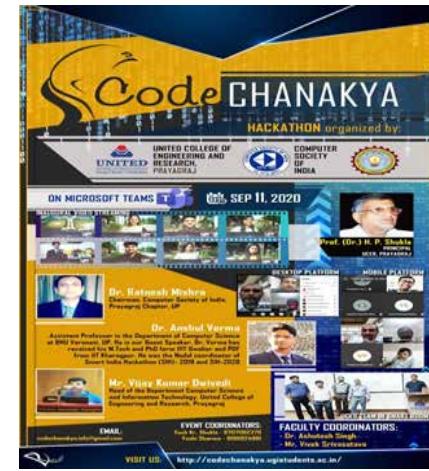
The Chapter organized a webinar on Digital Twin, AI and IOT over Tea on 29th September 2020. The event was commenced with the welcome address by Dr. Kumaresan, Chairman IEI Trichy. Distinguished speaker was introduced by Er R Selvaraj Chairman, CSI, Tiruchirappalli Chapter. Speaker Mr. Rajbarath gave an orientation about Digital Twin concepts in detail with its application in Power Plant Use case. Mr. D Senthil Kumar, Hon Secretary CSI Trichy, delivered Vote of Thanks.



UCER, Allahabad

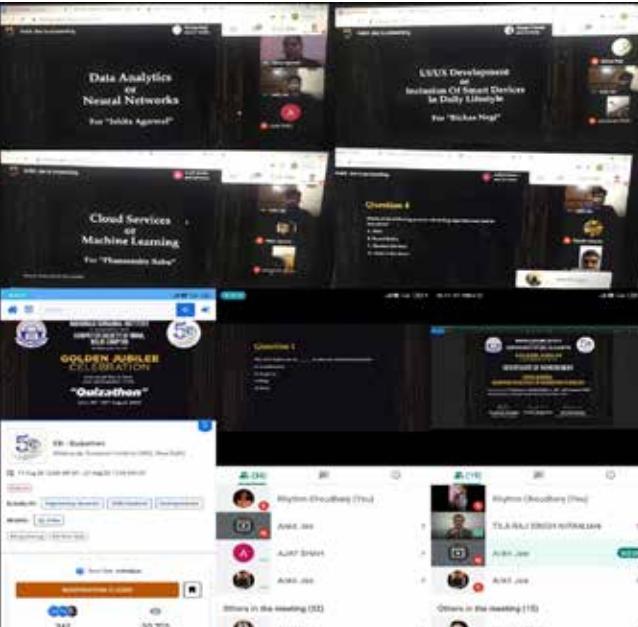
Reported by **Dr. Ratnesh Mishra**, Chairman, CSI Allahabad Chapter

The inaugural ceremony of Code Chanakya ; HACKATHON started with Saraswati Vandana followed by speech of our principal Prof. H.P. Shukla. Mr. Vivek Srivastava, master of ceremony, welcomed all the guests and students on the behalf of the UCER CS/IT Department. Mr. Vijay Kumar Dwivedi, Head CS/IT briefed about the innovative learning practices being followed in the department for better life and career of the students. Dr. Ratnesh Mishra, Chairman, CSI, Prayagraj Chapters focused on the importance of this event and the benefits and role of CSI for better future of the students. Dr. Anshul Verma described in detail about the hackathon event and future upcoming event Smart India Hackathon. Mr. Yash Kumar Shukla and Ms. Yashi, student coordinators explained the rules and guidelines of this event. Dr. Ashutosh Kumar Singh delivered vote of thanks for this event.



MAHARAJA SURAJMAL INSTITUTE, NEW DELHI (REGION-I)

Reported by Prof. Rhythm Choudhary, SBC, Maharaja Surajmal Institute



The CSI Student Branch of Maharaja Surajmal Institute, New Delhi in association with CSI Delhi Chapter on the occasion of its Golden Jubilee Foundation Day organized Quizathon, an e-quiz competition on 19th to 20th August 2020 in order to provide students an opportunity to test their knowledge about Computer Science and its various sectors. The event was organized in multiple rounds and students from various institutes across India participated in the event.

After the Finale Round, the winners are as follows:

1. Ishita Agarwal, Indraprastha Institute of Information Technology (IIIT), New Delhi won Cash prize of Rs. 5,100/-
2. Rishabh Raizada, Maharaja Surajmal Institute of Technology (MSIT), New Delhi won Cash prize of Rs. 3,100/-
3. Richaa Negi, Narsee Monjee Institute of Management Studies (NMIMS), Mumbai won Cash prize of Rs. 2,100/-

All participants of Final round were provided e-Certificates. Winners were offered Internship by CSI Delhi Chapter.

The event was organized by Prof. Rhythm Choudhary, Convenor, Mr. Manoj Kumar, Co-Convenor and Ms. Kanika Kundu, Co-ordinator along with team of enthusiastic students organizers: Ankit Jee, Jatin Bagga, Debaangshu Sen, Lakshmi Maurya, Abhishek Verma, Saakshi Malhotra and Sakshi Rana. Organizing Committee is thankful to Prof. Dr. Rachita Rana – Director MSI and the whole Management Committee of CSI Delhi Chapter for this great opportunity.

After the event was concluded, all the students and faculty members were addressed by Chairman - Shri. Raj Singh Nirjanjan.

He appreciated the efforts of faculty and student organizers. He also had an interactive session with the students to motivate them for their future endeavours and to know what the youth thinks about the progress and benefits to society and the world.

G H PATEL COLLEGE OF ENGINEERING & TECHNOLOGY, ANAND (REGION-III)

Reported by Dr. Maulika S Patel, SBC, G H Patel College of Engineering & Technology

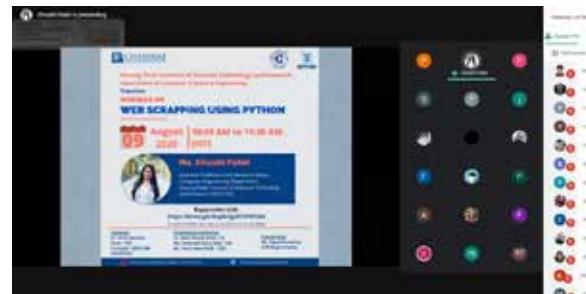


The CSI Student branch at G H Patel College of Engineering and Technology, Anand has organized a recurrent online coding challenge "CODEVIE 7.0", on 11th September 2020. The event was filled with various challenges and numerous logical and analytical problems. The contest consisted of one round which was hosted on CodeChef. The problems in the challenge were based on Data Structures and Algorithms which would be one of the most important topics for aspiring programmers. There were participants from multiple colleges.

About the contest: The coding problems were of type observation and basic to medium implementation. There were 5 problems in total. Students learned to apply different approaches to one problem and also developed their reasoning and logical skills. The winners of the contest : Hemil Kakadiya and Prince Lakhani

DEVANG PATEL INST OF ADVANCE TECH AND RESEARCH, ANAND (REGION-III)

Reported by Prof. Janardan Bharvad, SBC, Devang Patel Institute of Advance Technology and Research



Devang Patel Institute of Advance Technology and Research (DEPSTAR) hosted a webinar on Web Scrapping using Python in association with the Computer Society of India on 9th August

2020. One of the main goals was to make students aware about Web scrapping and its applications. The Webinar was structured in such a way that all the topics which were necessary for a newbie to start learning about scrapping and applications. The Webinar was coordinated by Mr. Dipak Ramoliya. The webinar was delivered through Google Meet platform. There were total 100 participants present in the webinar. Ms. Khushi Patel was the speaker for the event and explained the concept very well and shown live demo of scrapping of Covid-19 Data from Covid-19 Website.

SANGAM UNIVERSITY, BHILWARA (REGION-III)

Reported by Prof. Kuntal Barua, SBC, Sangam University



Department of Computer Science, Sangam University conducted An International Induction Programme on "Building the Foundations of Strategic and Winning Newcomer Mindsets" on 15th September 2020. This webinar organized by Prof. Kuntal Barua. In this webinar total 3 distinguished speakers present from all over the world and they shared their views talents and knowledge.

All speakers were welcomed by Dy Dean Computer Science Dr. Sunil Kumar. Honorable Vice Chancellor Prof. Dr. K.P.Yadav, Sangam University India expresses his view on Strategic Management as helping to Prevent Spread of COVID-19. Prof. Dr. Akhilesh Kumar, Advisor Sangam University, expressed his thoughts on "Post-COVID-19 - Situation in Higher Education". Registrar Dr. O. P. Gupta, Sangam University India explained on "Post-COVID-19 - Impact & Strategies in Education Sector, India".

Dr. Celestine Iwendi, Distinguished Speaker, ACM. Senior member IEEE, Associate Professor, Bangor College China Central South University of Forestry and Technology /Bangor University, UK, delivered his thoughts on "Exploring Strengths and Weaknesses of Education 4.0 in the Higher Education Institution during COVID-19 or after COVID-19".

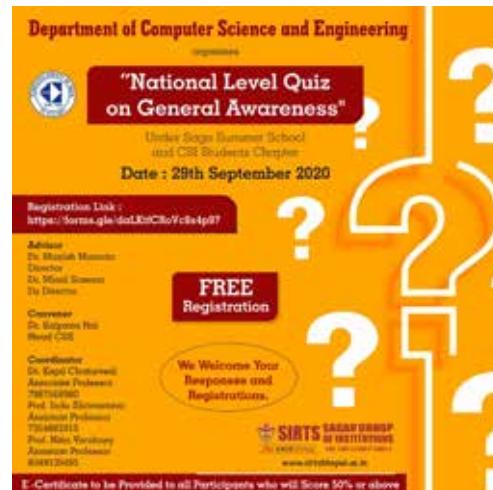
Mrs. Evangelia Vassilakou, Academic English instructor, International Speaker, Academic Advisor, The English Academy of Languages, Athens, Greece delivered a session on "How to ace the language of business interviews: Analyzing the top job interview question-answer patterns via exploring the differences between spoken and written discourse".

Dr. WorakamolWisetsri, Associate Professor, King Mongkut's University of Technology, North Bangkok Thailand expressed her view on "Re-Skilling and Up-Skilling: A Strategic Response to Changing Skill Demands for Professional Development".

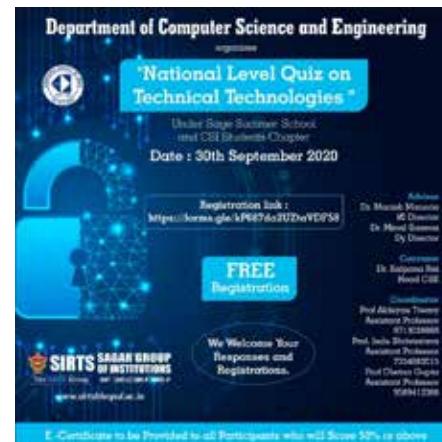
In the end the closing ceremony and vote of thanks was given by Dy Dean Computer Science Sangam University India Dr. Sunil Kumar. All the faculties of computer science were present and participated in this webinar.

SAGAR INSTITUTE OF RESEARCH TECHNOLOGY & SCIENCE, BHOPAL (REGION-III)

Reported by Dr. Kapil Chaturvedi, SBC, Sagar Institute of Research Technology & Science



Department of Computer Science & Engineering, SIRTS, Bhopal Organized a National Level Quiz on General Awareness under Sage Summer Training, IQAC Cell and CSI Students Chapter of SIRTS on 29th September 2020. Under the guidance of Dr. Manish Manoria, Director, SIRTS, Dr. Minal Saxena, Dy Director, SIRTS, Dr. Kalpana Rai, HOD-CSE under the coordination of Dr. Kapil Chaturvedi, Prof. Indu Shrivastava & Prof. Nitin Varshney.

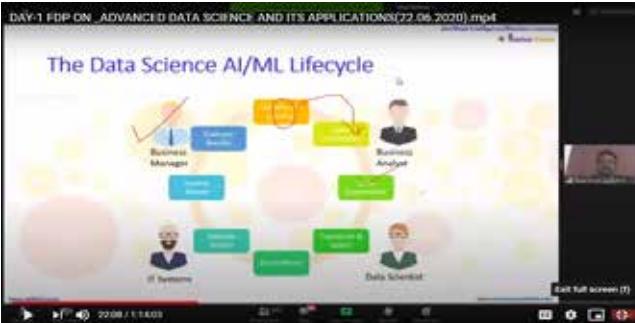


Department of Computer Science & Engineering, SIRTS, Bhopal Organized "National Level Quiz on Technical Technologies" Under Sage Summer Training, IQAC Cell and CSI Students Chapter of SIRTS on 30th September 2020. Under the guidance of Dr. Manish Manoria, Director SIRTS, Dr. Minal Saxena, Dy Director SIRTS, Dr.

Kalpana Rai, HOD-CSE under the coordination of Prof. Abhiyan Tiwary, Prof. Indu Shrivastava and Prof. Chetan Gupta. More than 1000 students, academicians and industry personas from different states was participated

BVRIT HYDERABAD COLLEGE OF ENGINEERING FOR WOMEN, HYDERABAD [REGION-V]

Reported by **Prof. S. Rama Devi**, BVRIT Hyderabad College of Engineering for Women



CSI Student Branch of BVRIT Hyderabad College of Engineering for Women organized a one Week FDP on Advanced Data Science and its Applications during 22nd to 26th June 2020. Various topics were covered starting with Basics of Data Science and explained about Data Visualizations and Summarization, the Real time Case Study of Body Fat Data and followed by Quiz daily during the FDP. A total of 1660 registered for the FDP.

PRAGATI ENGINEERING COLLEGE, SURAMPalem [REGION-V]

Reported by **Dr. M Radhika Mani**, SBC, Pragati Engineering College



The Department of CSE., in association with CSI, Pragati Engineering College conducted a National Level Technical Quiz on "Object Oriented Approach for Software Development" on 5th September 2020. The HOD of CSE Dept. Dr. M Radhika Mani coordinated the event. Principal Dr. S Sambhu Prasad, PEC, congratulated all the

participants and the organizing team. The event received huge response with many engineering students actively participated in the event. A total of 525 participants enrolled in the event. A total of 244 participants got more than 60%. The external participants are from various colleges showed their technical skills through this event. It was very informative and knowledge enriching competition for the participants. Pragati Engineering College always encourages such positive competitions and hopes to bring out the best in all its students through such competitive events, while ensuring that the students learn through all possible ways not just through books and classroom teaching. The e-certificates are issued to participants who got above 60% in quiz competition.

KALLAM HARANATH REDDY INSTITUTE OF TECHNOLOGY, CHOWDAVARAM [REGION-V]

Reported by **Prof. N. Md Jubair Basha**, SBC, Kallam Haranath Reddy Institute of Technology



To expose the Faculty in emerging technologies in the areas of Cloud Computing, Kallam Haranath Reddy Institute of Technology, Chowdavaram has organized a three-day online Faculty Development Programme on Cloud Datacentre Infrastructure from 18th to 20th May 2020. This FDP provides practical foundation level training that enables immediate and effective participation in Cloud Data Center Infrastructure. The resource person for the event is Dr. K Jairam Naik, NIT, Raipur, Chhattisgarh, India. Nearly 600 participants have been registered for Online FDP.



Kallam Haranath Reddy Institute of Technology, Chowdavaram has organised three days FDP on Blockchain Technology from 26th May to 28th May 2020. To expose the Faculty in emerging technologies in the areas of Block chain Technologies. This FDP provides knowledge on Block chain technologies, crypto currencies, bit coins.

NARAYANA ENGINEERING COLLEGE, NELLORE (REGION-V)

Reported by Prof. V Muniraju Naidu, Narayana Engineering College



CSE Department of NEC, Nellore organized Arohan – 2020, a NationalLevel Student Technical Symposium which started with a grand fervor on 26th September 2020 in association with CSI Student Branch. This Symposium is conducted virtually for UG & PG students. The inauguration program started with a warm welcome to everyone and a striking Audio Visual that vividly captured the details of the CSE department. Subsequently, welcome prayer was presented by the III B.Tech student of CSE department. The dignitaries were honored and lit up the lamp marking an auspicious beginning to the event.

The Head of the CSE Department, Dr. C Rajendra greeted the guests and addressed the gathering through Zoom with a highlight on the achievements of the CSE department. The Principal Dr. G Srinivasulu Reddy addressed the gathering and emphasized on the importance of coming up with technological inventions that do not pollute the surroundings. Program Chief Guest Sri Sri Tandava V Krishna Popuri, Software Engineering Director, Dell India R & D, addressed the gathering, Krishna Popuri shared his experiences during his education and inspired the students to come out of their shells to explore and take up challenges in life by moving out of the "comfort zone" to reap success. He said that the students need to develop entrepreneurship skills and that it is something most graduates don't endeavor in India.

Around 520 students participated in the Symposium in various events and were awarded with mementos and certificates. Participation Certificates were also awarded to all participants. Dr. AVS Prasad, Director-Narayana Engineering & Pharmacy Colleges appreciated the participants from various states. Dr. C Rajendra-HOD CSE, advised the students to participate in such programs to enhance their skills. Mr. V Muniraju Naidu participated in the Symposium.

NEW HORIZON COLLEGE OF ENGINEERING, BANGALORE (REGION-V)

Reported by Dr. B Rajalakshmi, SBC, New Horizon College of Engineering



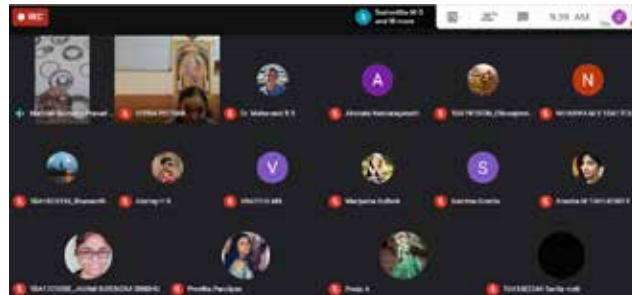
The department of CSE, New Horizon College of Engineering, Bangalore organized a Motivational Talk on 25th September 2020. Mr. Easwar Sundaresan was invited to speak on "The COVID-19 opportunity: Making the best of the Pandemic". The speaker gave insights on various spheres of life, what has to be focused and what has to be given less importance. He also highlighted the following: Identifying important tasks using 4 quadrants, programmed Vs non-programmed decisions, balancing the indoors and outdoors, type of motivators, social media during pandemic, addressing fears and simple ways to stay positive. Students were very inspired and happy after the talk.



New Horizon College of Engineering, Bangalore organized an Alumni Talk on 26th September 2020. Two distinguished alumni were invited to speak on different topics like "Demystifying campus to corporate" and "Introduction to software testing". Ms. Archana gave lot of tips on getting ready, and how to move from campus to corporate. Mr. Dilish highlighted the significance of testing in software industry. He also gave an insight on the various testing tools that are available. The session was very interactive with questions from the audience.

DR. AMBEDKAR INST. OF TECHNOLOGY, BANGALORE (REGION-VI)

Reported by Prof. Asha K. N., Dr. Ambedkar Institute of Technology



Dr. Ambedkar Institute of Technology, Bangalore has organized a webinar on Significance of Referencing in Technical Writing and Tools for Detecting Plagiarism on 19th September 2020. The webinar was started by the HOD (I/C) Mrs. Asha who introduced the Guest of Honor Prof. Surendra Prasad Babu, RVP-V, CSI. Prof. Surendra Prasad Babu addressed the participants. The speaker Dr. B S Mahanand explained the topic briefly. There were around 172 participants attending the webinar through Google Meet. The webinar ended with a vote of thanks by Mrs Veena Potdar.

SAI VIDYA INSTITUTE OF TECHNOLOGY, BANGALORE (REGION-V)

Reported by Dr. Sangeetha V, Sai Vidya Institute of Technology



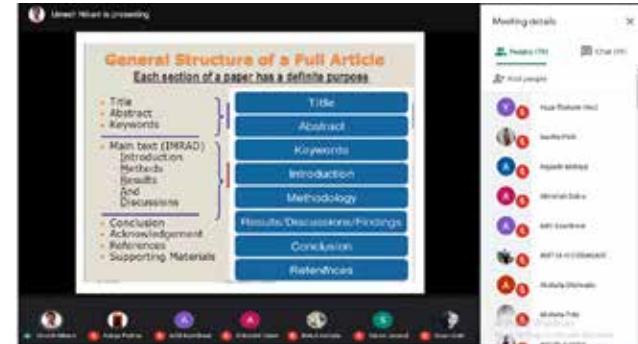
Sai Vidya Institute of Technology, Bangalore has organized the Webinar on Augmented Reality - The Interface of Future on 22nd July 2020. Various topics were covered during the event. Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory. Augmented reality is used to enhance natural environments or situations and offer perceptually enriched experiences. With the help of advanced AR technologies (e.g. adding computer vision, incorporating AR cameras into smartphone applications and object recognition) the information about the surrounding real world of the user becomes interactive and digitally manipulated. Information about the environment and its objects is overlaid on the real world.



Sai Vidya Institute of Technology, Bangalore has organized a Webinar on An Insight into Web Application Development on 1st August 2020. A desktop application is a standalone application that is installed on a desktop or laptop computer. It can be full-featured like Microsoft Excel or perform one or two functions like the calendar app. A website is a group of globally accessible, interlinked web pages which have a single domain name. A web application is a software or program which is accessible using any web browser. Web Designing deals with designing the website's look and feel before a web developer can start developing it. UI/UX Design is an important aspect of web development, because it builds the look and feel of the product offered to customers.

SIPNA COLLEGE OF ENGINEERING AND TECHNOLOGY, AMRAVATI (REGION-VI)

Reported by Prof. Yugandhara A Thakare, Sipna College of Engineering and Technology



Department of Computer Science & Engineering, SIPNA College of Engineering and Technology, Amravati conducted Webinar on "Technical Paper Writing" under CSI Student Branch on 31st July 2020. Prof. U V Nikam (PRMITR, Badnera) was the speaker for the webinar. The main focus of webinar was on how to write a research paper and review paper, how to write a journal abstract and the tips for getting accepted in reputed journals, the process of publishing in an academic journal and the selection of publishing their research work, structure of a Journal paper, citations and plagiarism. This Webinar received a response with 74 students of Third and Final year from CSE Department. Principal Dr. S M Kherde and Head of Department Dr. V K Shandilya guided for the successful accomplishment of this event.



Department of Computer Science & Engineering, SIPNA College of Engineering and Technology, Amravati conducted Webinar on "Data Analytics using Pentaho Data Integration" under CSI Amravati Chapter on 8th August 2020. Mr. Saurabh Deshmukh (Data Architect, Tech Mahindra Ltd., United Kingdom) was the resource person. The webinar aimed at informing students in detail about data, information, Data Analytics, EL, ELT, ETL and Open source Pentaho Data Platform. This Webinar received a huge response with more than 213 students through GoogleMeet Live platform. Webinar ended with question answering session where students asked their queries related to topic. The event was co-ordinated by Prof. K R Ingole and Prof. Y. A. Thakare (CSE Dept.). Principal Dr. S. M. Kherde and Head of Department Dr. V. K. Shandilya guided for the successful accomplishment of this event.

SHRI KRISHNASWAMY COLLEGE FOR WOMEN, CHENNAI (REGION-VII)

Reported by Dr. S. Gayathri, Shri Krishnaswamy College for Women



The International Webinar on "IOT Security Capstone" was successfully organized by the Department of Computer Science of Shri Krishnaswamy College for Women in association with CSI with the active participation of students from various colleges in and around Chennai on 4th of September 2020. Dr. Thirumurugan Shanmugam, Head of Computer Networks, University of Technology and Applied Sciences, Sultanate of Oman was the resource person of the session.

The session mainly focused on creating awareness among the participants to overcome security issues in IoT devices. The Webinar provided an opportunity for the students to gain knowledge and perspective on privacy and security issues in IoT(Internet of Things). The session also provided a platform for the students on how to implement the safety measures to help combat the cyber threats. Dr. S. Gayathri, Head, Department of Computer Science, thanked the Management, Dean, Principal, Faculty members and all the participants for making the Programme a grand success.

SRM VALLIAMMAI ENGINEERING COLLEGE, KATTANKULATHUR, CHENNAI, (REGION-VII)

Reported by Dr. M Senthil Kumar, SBC, SRM Valliammai Engineering College



SRM Valliammai Engineering college CSI Student Branch Organised a Guest Lecture on the topic "Different Roles in Data Science Industry" on 13th September 2020 via Microsoft Teams for CSI Volunteers of our college. Mr. R Dinesh Karthik, Senior Data Engineer at Zalando SE, Berlin Area, Germany delivered the talk on the various roles and importance of Data Science Industry. A total of 115 Participants including several alumni, staff members and the students joined the meet and made the session interactive and successful. The resource person gave a detailed explanation on Data Science quoting several facts and statistics in this blooming industry. Queries were also asked at the end of the session were II year and III year students clarified their doubts.

The Meeting was organized by Mr. G Kumaresan, AP and Ms C Pabitha, AP Alumni Coordinators of CSE Department. The meeting acted as a breakthrough in bringing up the students and alumni/staff together and provided a much welcomed initiative and encouragement in this current pandemic situation. Dr. B Vanathi, Prof. & Head of the Department motivated the alumni and the present younger minds to coordinate in the difficulties and to explore more opportunities in attaining greater level. The meeting was concluded with common discussions and clarifications.



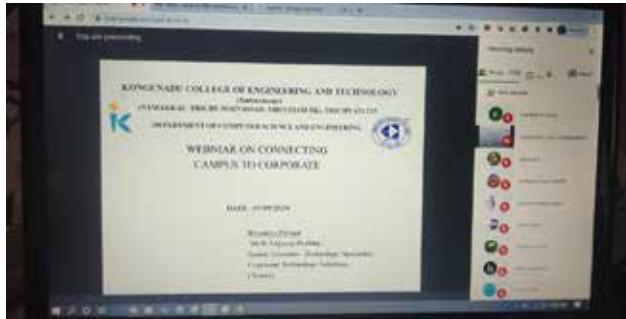
Computer Society of India SRM VEC Student Branch in association with Dept CSE organised a Webinar on the topic "Into the World of Deep Learning" on 20th September 2020 via Microsoft Teams. Mr. A Vishal, Research Assistant at Illinois Institute of Technology, Greater Chicago Area delivered the talk. A total of 88 Participants joined the meet and made the session interactive and successful. The resource person gave a detailed explanation on overview of Deep learning

and practical implementation of several use cases like Driverless car, Handwriting recognition and medical applications. Queries were also asked at the end of the session and clarified their doubts.

The Meeting was organized by Mr. G Kumaresan, AP, and Ms C Pabitha, AP (Alumni Coordinators of CSE Dept). The meeting acted as a breakthrough in bringing up the students and alumni/staff together and provided an initiative and encouragement in this current pandemic situation. Dr. B Vanathi, Prof. & HOD motivated the alumni and the present younger minds to coordinate in the difficulties and to explore more opportunities in attaining greater level. The meeting was concluded with common discussions and clarifications.

KONGUNADU COLLEGE OF ENGINEERING & TECHNOLOGY, THOTTIAM, TRICHY (REGION-VII)

Reported by **Dr. J Yogapriya**, SBC, Kongunadu College of Engineering & Technology



The Department of CSE in association with Computer Society of India have organized a webinar on "Connecting Campus to Corporate" on Sep 5th, 2020 via Google Meet. The students belonging to the Department of CSE of our college has participated in this event. Dr. P S K R Periaswamy, Chairman, Kongunadu Institutions has presided over the function. The event started with the welcome address by Ms T Kaviyalakshmi, Final year CSE. Dr. R Asokan, Principal addressed the students about the importance of webinar on connecting campus to corporate. Dr. J Yogapriya, Dean(R&D) has given the Felicitation address and motivated the students to improve their technical knowledge to solve the real world problems based on industry demand. Mr. R Nagaraja Prabhu Senior Associate–Technology Specialist, Cognizant Technology Solutions, Chennai, was the chief guest for this Seminar. The chief guest explained the Interview Procedure on MNC's, what Industry expect from you, how to crack interviews, aptitude short cuts and important websites for preparing the interview was discussed with students. The end of the seminar consisted of interactive small group of plenary discussions with feedback session. The event concluded with vote of thanks given by Mr. M Atchaya, Final Year, Computer Science and Engineering Department.

SRI ESHWAR COLLEGE OF ENGINEERING, COIMBATORE (REGION-VII)

Reported by **Prof. S. Saradha**, SBC, Sri Eshwar College of Engineering Sri Eshwar College of Engineering, Coimbatore organized Internal

Coding contest "Sri Eshwar CODE CHEF 2020" for 2nd Year CCE, CSE, ECE, EEE & IT students in association with Computer Society



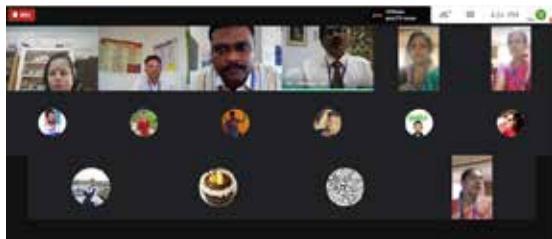
of India on 28th and 29th August, 2020. The event was organized by Department of Computer Science and Engineering. The event was conducted in online via skillrak portal. More than 400 students participated in 2 rounds coding contest and showed their coding skills by writing instant code for given problems in programming languages like C, C++ & Python. Winners of the event got awarded by certificates.



Sri Eshwar College of Engineering, Coimbatore organized Internal Coding contest "Sri Eshwar CODE JAM 2020" for 3rd Year CSE, ECE & EEE students in association with Computer Society of India on 28th and 29th August 2020. The event was organized by Department of CSE. The event was conducted in online via skillrak portal. More than 350 students participated in 2 rounds of coding contest and showed their coding skills by writing instant code for given problems in programming languages like C, C++, Java & Python. Winners of the event got awarded by certificates.

SRM TRP ENGINEERING COLLEGE, TRICHY (REGION-VII)

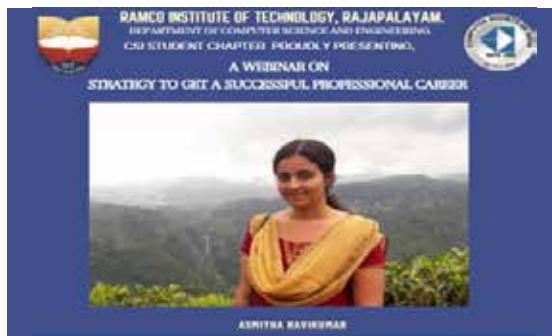
Reported by Dr. P. Sudhakaran, SRM TRP Engineering College



SRM TRP Engineering College, Irungalur, Trichy has conducted three events such as Thought bots, Tech connector, Code wizard and More than 100 students are participated and Won the Prizes. The HoD, Faculty members, Placement Officer and CSE department students are participated. Finally Vote of Thanks proposed by M. Mohamed Arshath, Final Year CSE Student.

RAMCO INSTITUTE OF TECHNOLOGY, RAJAPALAYAM (REGION-VII)

Reported by Prof. M. Swarna Sudha, SBC, Ramco Institute of Technology



The Department of CSE, Ramco Institute of Technology organized Virtual Webinar on "Strategy to get a Successful Professional career" in association CSI Student Branch on 23rd July 2020. The resource person Asmitha RaviKumar, Associate Technical Consultant, Vuram Technology Solution, Alumni (2014 Batch) discussed the methods and tricks to get success in professional career and also shared how to prepare for the software company interviews and significance of doing online courses. Also, she discussed the benefits of doing Mini projects and advice the students to actively participate in all the events. 100 participants from various Departments participated actively through Google meet. The participants expressed that the webinar was highly enlightening and useful. Mrs M Swarna Sudha, AP/CSE and Ms P Jothi Thilaga, AP/CSE were the co-ordinators for the event. Mrs M Swarna Sudha thanked for his instant acceptance and welcomed Ms Asmitha Ravi Kumar to express the ideas about "Strategy to get a Successful Professional career".

CHRIST COLLEGE OF ENGINEERING, THRISSUR (REGION-VII)

Reported by Prof. Raisa Varghese, SBC, Christ College of Engineering Jalakam, an initiative by the CSI Student Branch of Christ College

of Engineering in association with CoDE (Computer science dept. Association) aimed to distribute refurbished Mobile Phones to students who are in need, to assist them in their online classes. This socially inclined initiative of CSI, was inaugurated on the 29th of June 2020, by the Irinjalakuda Block Panchayat President Sri Manoj, in the presence of the Executive Director Fr John Paliakara, Joint Director Fr Joy Payappilly, Principal Dr. Sajeev John, CSE Dept. HOD Mrs Remya Sasi and CSI Student Chapter Coordinator Mrs Raisa Varghese by giving out refurbished phones to the students of Irinjalakuda VHSE through it's Principal.



This special initiative is a description of our communal responsibility and also our environmental responsibility as damaged phones are refurbished and put to good use. No words are enough to express the gratitude and thankfulness to the group of people who worked tirelessly for the success of this initiative. They are Nova Mary Thomas, Lazar Tony, Simon N Pallan, Amal Davis, Sivadarsh, Austin Johns, Renil Benny, Harikrishnan (S6 CSE), Abdul Ahad(S4 CSE) and Arun Joseph (S2 CSE).With over 30 phones distributed to the deserved students through their respective school Principals , the initiative was a heartfelt success.

**Data Science Research Avenues
in the Post Pandemic Era**

Dr. Susan Elias
Associate Professor
School of Electronics Engineering,
Vellore Institute of Technology, Chennai
www.vit.ac.in



Christ College of Engineering CSI students branch organized two webinars. A webinar on Data Science was conducted on 15the August 2020 and another on Bio informatics was conducted on Research Challeneges in Bio informatics on 29th July 2020. The resource person was Dr. Visakh R from GEC, Idukki. The participants got an insight into the vast opportunities and project ideas in the area. The CSI students branch also organized a session on 15th August 2020. Executive Director Fr John Paliakara, Principal, Dr. Sajeev John, and other faculty members were present for the session. Dr. Remya K Sasi, HoD_CSE delivered the welcome address. Dr. Susan Elias, Associate Professor, School of Electronics Engineering, Vellore Institute of Technology was the resource person for the day. She conducted the session on the topic 'Data Science Research Avenues in the post pandemic era'. The session was informative for aspiring researchers. An open interactive session was held at the end of the talk. SBC Ms Raisa Varghese delivered the vote of thanks for the event. The session was attended by nearly 100 students and faculty members

B S ABDUR RAHMAN CRESCENT INSTITUTE OF SCIENCE & TECHNOLOGY, CHENNAI (REGION-VII)

Reported by Dr. N Ayyanathan, B S Abdur Rahman Crescent Institute of Science & Technology

B S Abdur Rahman Crescent Institute of Science & Technology, Chennai has organised the Webinar on Internet of Things & How to extract Data from IoT devices on 16th September 2020. Mr Pethuru Raj Chelliah, Chief Architect, Reliance JIO was the resource person for this event. There are 100 participants from various institutions has attended this event.



REPORTS |

Online Workshop on “Data Analysis & Visualization Using Pandas, Seaborn and Plotly in Python”

Reported by Mr. Jitendra Singh Kushwah, Assistant Professor, ITM Group of Institutions Gwalior



Three days workshop was conducted on "Data Analysis & Visualization Using Pandas, Seaborn and Plotly in Python" on 16th – 18th July, 2020 in association with ITM Group of Institutions Gwalior, The Institute of Engineers (India) organized by CSI Gwalior Chapter, Gwalior(MP).

In Inaugural function, Mr. Jitendra Singh Kushwah, Assistant Professor, ITM Group of Institutions Gwalior, Mr. Jayant Bhide, Regional VP, Region-3 CSI, Mr. Dilip Hayaran, Chairman, CSI Gwalior Chapter, Mr. Rakesh Khetan, Member, IE Gwalior Chapter, Dr. Rajendra Singh, Reformer & Socialist and Dr. Rishi Soni, HOD, Deptt of CSE, ITM-GOI Gwalior were present. Our Regional director Mr. Jayant Bhide encouraged the participants for the workshop and suggest to us to conduct this type of workshop in future for the faculties & students. Mr. Bhide also welcomes our expert and other dignitaries. Inaugural function hosted by Mr. Khetan, Member IE Gwalior Chapter. 100 candidates were registered for the workshop.

So, Positive response reflect in the workshop from all over india.

Mr. Jitendra expert of this online workshop continue this workshop and ask some questions to the participants regarding Data Analysis & Visualization to know knowledge of participants. First day, Mr. Jitendra gave introduction of core python and its need in the current scenario. Second day, Explore applications of Data Analysis using pandas library. In this, he used hands on approach using Jupyter Notebook. Third day, Mr. Jitendra elaborate Data Visualization & Its usability in data analysis using Matplotlib, Seaborn and Plotly libraries. In these days, Mr. Jitendra taught analysis of dataset, visualizes the data after analysis using Python editor Jupyter. all the sessions were hands-on. Students were enjoy all the sessions and ask many questions. Mr. Jitendra covered theoretical and practical sessions of all the topics successfully online using ZOOM app.

FeedBack: At the end of the day, Online Feedback form fill by the participants. According to feedback form, students strongly appreciated to Mr. Jitendra Singh Kushwah. His presentation skill, knowledge, problem solving method etc. was excellent. Participants also interested to conduct this type of workshop again by Mr. Jitendra.

In valedictory function, Mr. Jayant Bhide Regional VP, Region-3 CSI, Mr. Dilip Hayaran Chairman, CSI Gwalior Chapter, Dr. Rajendra Singh, Reformer & Socialist and Dr. Rishi Soni, HOD, Deptt of CSE, ITM-GOI Gwalior and Expert Mr. Jitendra Singh Kuswha were present. Vote of thanks given by Mr. Dilip Hayaran. He thanked the dignitaries, Academicians, Industry Professionals, Students and the members of CSI Gwalior Chapter for the support to make the entire workshop a grand success. At the end of the valedictory function, Mr. Jitendra share his view about three days workshop. He said that participants response was really overwhelming in spite of being a COVID-19 and they were participated in all the activity very interestingly. In this session, participants also share their view about the workshop and expert.



Computer Society of India™

CSI YITP AWARDS 2021



NATIONAL ROUND

Saturday 13th February, 2021
during CSI 2021

54th Annual Convention
at LUCKNOW

REGIONAL PRESENTATION ROUNDS IN SEVEN REGIONS

Last date for nomination : Monday, 7th Dec. 2020

Presentation Rounds : Saturday, 9th Jan. 2021

The National competition for young IT professionals is an event conducted annually and instituted by CSI in the year 1999 to encourage Researchers, IT professionals, Academicians, Consultants, Entrepreneurs and IT Practitioners in an Organization or as individuals in manufacturing / service / support / training functions in the field of Information Technology. The competition aims at involving young IT professionals in the quest of innovation in IT and provides them with an opportunity to demonstrate their knowledge, professional prowess and excellence in their profession.

Mr. Apoorva Agha

National Convenor

✉ apoorvaagha@gmail.com | ☎ 94153 16183



CSI 2021

54th ANNUAL CONVENTION

at Lucknow



CSI-IT Excellence Awards 2021

Technology Led Business Transformation

Recognition of the CIOs / Organizations who have done significant work in Technology Led Transformation using **ANY** technology

Saturday, 13th February 2021 during CSI 2021 54th Annual Convention at Lucknow

Criteria for the awards nominations is as follows:

Applications are invited from CIOs, Entrepreneurs and Organizations which have successfully implemented any of the following contemporary technologies for driving business transformation:

- ♦ Virtual / Physical / Hybrid Workspace – The New Normal
- ♦ IOT in Manufacturing Process
- ♦ Robotic Process Automation
- ♦ Innovative use of Bots/ Robotics
- ♦ Innovative application of cognitive application combined vision technology (including AR / VR)
- ♦ Advanced AI Applications
- ♦ Analytics and Machine Learning
- ♦ Block Chain
- ♦ Usage of Technology in Medicine/ Healthcare
- ♦ Usage of technology in Education
- The above list is only indicative, transformation programs in any of the emerging technologies are eligible.

Award categories will include Individual Nominees (CIOs/ Head of IT/ CEOs etc), Startups/ SMEs, Academic Institutes and large Organisations.

Nominations need to be submitted latest by 30th November 2020. Please write to below email ids for Nomination Form and Template.

Nominations to be submitted to csi.itea@gmail.com; with a copy to emailtosaurabh@gmail.com; apoorvaagha@gmail.com

Final Presentation and Award ceremony will be held on Saturday 13th February 2021 during 54th CSI 2021 Annual Convention at Lucknow.

For award sponsorships and any other query, write to: csi.itea@gmail.com

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अन्वेष
गण्डीय यांत्रिक असोसिएशन २०२१



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- International Conference
- Student-level Poster/Paper Presentation Sessions
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