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NIELIT Newsletter

National Institute of Electronics and Information Technology

(ISO 9001:2015 Certified Organisation)

An Autonomous Scientific Society of Ministry of Electronics and Information Technology, Government of India

Message from the Director General

While doing good work, it is important that best practices of every unit are shared and communicated to all stakeholders effectively. This Newsletter is an important tool in sharing experiences while also showcasing the successes. In order to streamline this exercise and to ensure greater participation by staff in the contributions to the magazine, an Editorial Board for the Newsletter has been constituted and entrusted with the responsibility of taking forward this activity.

This issue of the NIELIT Newsletter brought out by the new Editorial Board captures the notable activities of the organization during the quarter and includes a special article on the work at the Guwahati centre along with its six extension centres. I wish the Editorial Board all the success in this endeavour of bringing out useful newsletters.

Dr. Jaideep Kumar Mishra

INSIDE THIS ISSUE

Message from the Editor-in-Chief

Dear Readers,

Welcome to this issue of NIELIT Newsletter. It captures the notable activities of the organization. The new format of NIELIT Newsletter brings many interesting technical articles from the staff and students -Data warehouse for Data analytics, Citizen centric Digital India services,Brain Machine Interface, SMS enable Web apps, and case studies on MQTT Transmission. It also listed the student's project based on AI, IoT, Embedded system, identification of fake news, Smart shoes, automations etc.

Information Security Awareness and Education (ISEA) of Ministry of Electronics and Information Technology (MeitY, Govt. of India) in association with Microsoft and Data Security Council of India has launched a new project titled 'Cyber Shiksha' at NIELIT Patna for skilling women Engineering graduates in the field of cyber security. This is attracting many young women Engineers to join the workforce in the cyber security.

With the support from Ministry of Development of North Eastern Region (DoNER, Govt.of India), NIELIT center in North East (NE) India has successfully completed training of 10,000 state Government officials on IT & Digital Services (including GST) in the eight NE states. NIELIT has already made a mark in NE India through its widespread presence. This issue carries an exclusive article about in NIELIT Guwahati in Assam. It was started operating in 1998 with a Centre (then CEDTI) in Tezpur town; NIELIT has expanded its reach to 6 more districts in thestate including a study centre at the largest River Island – Majuli in Assam.

This issue of newsletter also showcases some significant activities such as workshops on Qualitative Research Methods, Machine Learning,e-Waste training, Digital Payment etc.; Capacity Building for various categories of masses ranging from school students to government employees, from underprivileged youth to Engineering graduates. In the same manner, several developmental activities are going in every NIELIT centers. On behalf of editorial team, I request the readers to share their valuable feedback at newsletter@nielit.gov.in.

Happy reading!

(Dr. Yumnam Jayanta Singh)

Capacity Building in IT & Digital Services in North East States

The project titled **"Capacity Building in IT & Digital Services (including Digital Payments and GST)"** with a target to train 10,000 State Government Officials on IT and Digital Services in North Eastern Region (NER) has been successfully completed by NIELIT. With the support of Ministry of DoNER (Development of North Eastern Region) and North East Council (NEC), the two weeks training programme was delivered through 320 batches by all NIELIT Centres located in the North East Region.

The objective of the project was to enhance IT skills of the Officials by providing them with digital sills viz. Digital Literacy, e-Governance Services, GST Training and to facilitate regular use of IT and Digital Services as a way of life and especially in official work. A total of 616 Departments such Forest & Environment, Social Welfare, Handloom, Tourism, Community & Rural Development, Water Resources, Department of Personnel etc. have participated in the training programme. The programme received overwhelming response in all NE States.

Progress of Building Permanent Campuses of NIELIT

Land : 3.24 Acre	Completion of Renovation work	**Land : 4.13 Acre**	Completion of Construction work
Built-up Space: Centre is Operational in Own Building	• Admin & Academic Building • Boundary wall work	**Built-up Space:** Centre is running in about 3000 sqft built –up space provided by State Govt.	• Admin Building • Girls hostel

Land : 24 Acre	Completion of Renovation work	**Land : 4.13 Acre**	Completion of Construction work
Built-up Space: Centre is Operational in Own Building	• Admin Building • Renovation Work	**Built-up Space:** Centre is running in about 3800 sqft built-up space taken on rent	• Admin Building • Girls hostel • Pump House • Rain Water Harvesting

News from Delhi Centre

Workshop on Machine Learning

As a part of Internal capacity Building, NIELIT Delhi Centre organised a 3 Day Workshop on Machine Learning for Data Science & Analytics from 23rd to 25th May 2019. The workshop was enriched with the delivery from experience of eminent academicians, Prof. M.M. Tripathi, Professor, Delhi Technical University, Prof. Devendra Tayal, Indira Gandhi Delhi Technical University for Women and Shri Rahul Pathak, Artificial Intelligence Consultant. Participants were given an introduction of regression, clustering, classification techniques etc. in Machine Learning.

Skill Augmentation for Employees of Ministry of Defence

NIELIT Delhi Centre has successfully completed training for Defence Personnel sponsored by Directorate General of Resettlement, Ministry of Defence on "Certified Multimedia Developer". The training was conducted from14th Jan, 2019 to 5th April, 2019 for a batch of 37 participants.

Training for Delhi Doordarshan and Air Engineers

NIELIT Delhi Centre conducted two training programs of 10 days each on "Computer Networking and Server Administration" for 50 Broadcast Engineers of Delhi Doordarshan and All India Radio at National Academy of Broadcasting and Multimedia (NABM), Delhi.

Training for Officials of Central Warehouse Corporation (CWC), Delhi Region

NIELIT Delhi has organized trainings for the officials of Central warehouse Corporation (CWC), Delhi Region on"Computer Fundamentals & Internet Concepts". A total of 70 officials of CWC participated in the training in the three batches.

News from Haridwar Centre

e-Waste Management

A workshop on e-Waste Management for state government officials was conducted by NIELIT, Haridwar on 22nd April, 2019. The officials were addressed about the e-Waste Management, its impacts on the environment and its proper disposal. The officials were benefitted and appreciated the efforts put in by NIELIT Haridwar for creating awareness on e-Waste Management.

Digital Payment Awareness and Information Security

Workshops on "Digital Payment Awareness and Information Security" were conducted at Mahila Mahavidyalaya PG College, Kankhal; S.M.J.N PG College; Government Girls Inter college of Haridwar and at Tibetan SOS VTC Institute, Dehradun in the month of April and May 2019. Around 500 participants comprising of students and faculties have attended the workshop.

Advanced Courses for Engineering Graduates - IoT, Python, etc.

Under Summer Training Program of NIELIT Haridwar, short term courses in Internet of Things (IoT), Python, MATLAB, Web Technologies etc. were conducted. So far, the students from THDC-IHET (THDC – Institute of Hydropower Engineering and Technology); Tehri, DIT University, Dehradun, and Jaypee University of Information Technology, Solan have undergone these summer training programmes.

News from Imphal Centre

Project Review and Steering Group (PRSG) Meeting

The 7th Project Review and Steering Group (PRSG) Meeting of the Project "Development of North-Eastern Region by enhancing the Training/Education Capacity in Information Electronics & Communication Technology (IECT) Area" was held on 25th April 2019 under the Chairmanship of Dr. Jaideep Kumar Mishra, Joint Secretary, MeitY. Shri Anil Kumar Pipal, Director, HoD (HRD), MeitY; Shri Th. Prameshwor Singh, Executive Director, NIELIT Imphal and other senior Officers of NIELIT HQ and North-Eastern Region attended the meeting at NIELIT Imphal.

Rooftop Solar PhotoVoltaic Entrepreneur

A 5-Days training Program on Rooftop Solar PhotoVoltaic Entrepreneur was conducted during April 2019 at NIELIT Imphal in association with Ministry of New and Renewable Energy (MNRE) and sponsored by World Bank SUPRABHATA program.

Prime Minister Kaushal Vikas Yojna (PMKVY)

Inaugural function of 1st Batch Skill development Courses under Prime Minister Kaushal Vikas Yojna Ministry of Skill Development was held on 18th June, 2019 at NIELIT Imphal in the presence of Shri K. Baruah, Director, NIELIT Guwahati; Shri N. Manglem Singh, Director, MANIREDA, Govt. of Manipur and Shri Th. Prameshwor Singh, Executive Director, NIELIT Imphal.

Talk on Information Technology

A Talk on "IT Profession -The Inside Story and Trends" by Shri AilanMaibam, Lamzing Technologies Pvt. Limited was conducted for the students of NIELIT Imphal on 8th April, 2019 at the Centre.

News from Kolkata Centre

Placement

On completion of Free Employability Training under the TCS Affirmative Action Program (TAAP) organised by NIELIT Kolkata for its 22 students from SC/ST and economically backward classes from Minority and other social groups, 9 candidates were offered jobs under this scheme and 6 candidates have joined.

Invited Talk on Cryptography Algorithm

Dr. Shanta Laishram, Associate Professor of Mathematics, Indian Statistical Institute (ISI), New Delhi delivered an Invited Talk on Cryptography Algorithm, organized by NIELIT Kolkata on 15th May, 2019. He focussed on different Cryptography algorithms and made the students of the Centre aware of the different opportunities available at ISI.

Symposium on Qualitative Research

A one-day "Symposium on Qualitative Research" was organised on 24th April, 2019 by NIELIT Kolkata in order to provide a platform for identifying research needs and understanding methods and techniques that are used for conduction of research. Dr. Amlan Chakrabarti, Dean, Engineering and Technology of Calcutta University; Dr. Chandan Mazumdar, Professor, Dept of Computer Science & Engineering, Jadavpur University; Dr. Nilanjan Dey, Assistant Professor, Dept of Information Technology, Techno India College of Technology, Kolkata; Retd. Prof. S.C. Mehrotra and Dr. Babasaheb Ambedkar Marathwada University, Aurangabad delivered at the event that enriched around 50 participants. Dr. Y Jayanta Singh, Director, NIELIT Kolkata focused on plagiarism and citations.

News from Kohima Centre

Android Training for State Govt. Officials

A one-month Training on 'Android App Development and Networking' was conducted for the officials of Department of Information Technology & Communication, Govt. of Nagaland in April 2019 by NIELIT Kohima.

NEET (UG)-2019 Exam

Students queuing for verification before the Test

The National Eligibility cum Entrance Test (UG) 2019 for admission to undergraduate medical and dental courses was conducted successfully at NIELIT Kohima on May 05, 2019. More than 500 students appeared in the exam.

The National Eligibility cum Entrance Test is underway at Kohima

Cyber Crime for Law Enforcement Agencies

Equipping legal fraternity and Law Enforcement Agencies to meet the rising challenges of cyber crimes and related issues, an awareness programme titled 'Cyber Crimes, Cyber Laws in India and Electronic Evidence' for lawyers, prosecutors and law enforcement agencies was conducted by NIELIT Kohima on May 24, 2019. The program was conducted jointly with Nagaland State Legal Services Authority (NSLSA) and it was enriched with the talks delivered by Shri Manish Manocha and Ms. Meena Bhandari, Advocate, Supreme Court of India.

Seen in the picture are Director i/c, NIELIT Kohima with members of NSLSA and resource persons of the programme.

Livelihood Enhancement for Underprivileged Youth

Improving employability and livelihood opportunities of the underprivileged youth of Eastern Nagaland, NIELIT Kohima is conducting month long residential training on "Repair & Maintenance of Power Supply, Inverter and UPS" under sponsorship of Department of Underdeveloped Areas (DUDA), Government of Nagaland. The training program is focused on providing theoretical and hands-on training both of which are equally important for ensuring appropriate learning experiences to the participants. So far, two batches of training have been successfully conducted.

Distribution of Kits to the trainees

News from Patna Centre

CYBER SHIKSHA FOR WOMEN - A REPORT

NIELIT Patna Centre is providing training on Cyber Security and Cyber Forensics to women candidates under the Project Cyber Shiksha launched by Data Security Council of India sponsored by Microsoft. On completion of the 1st batch training, a Certificate Distribution Ceremony was held at the Centre on 30th April 2019 in the august presence of Shri Jaideep Kumar Mishra, Director General, NIELIT and Joint Secretary, MeitY. The event was also attended by Shri Rama Vedashree, CEO, DSCI as the Chief Guest and Shri Alok Tripathi, Director-in-charge, NIELIT Patna Centre. Director General addressed the participants and highlighted about the key activities of NIELIT.

During the training program, Mrs. Manju Dhasmana, Director CSR, Microsoft visited NIELIT Patna Centre to meet and motivate women candidates. She appreciated the valuable efforts done by NIELIT Patna in the field of skilling in IT and electronics, specially employment oriented programs.

Skilling for Bihar Gram Yojna Society-PES, e-Panchayat, GPMS

3 Days Training program on "PES, e-Panchayat, GPMS and Other State Specific Apps and WAPs" for the Data Entry Operators and Accountants of Bihar Gram Swaraj Yojna Society (BGSYS), Deptt. of Panchayati Raj, Govt. of Bihar was held in 8 Districts of the state i.e. Samastipur, Madhubani, Patna, Nalanda, Bhojpur, Rohtas, Gaya and Aurangabad . It will help in strengthening Panchayati Raj System in Bihar State.

Information Security Workshop for District Officials

NIELIT Patna has conducted e-Governance and Information Security Workshop for District Officials of Nawada and Gaya District of Bihar. 150 District Officials from each District had attended the Workshop. Another workshop was also conducted for 21 IT related Employees of CGWB (Central Ground Water Board) of Patna.

News from Agartala Centre

Information Security Awareness

A half day workshop on Information Security Awareness was organized at Hindi Higher Sec. School by NIELIT Agartala in association with CDAC, Agartala on 26th April 2018 under Information Security Education and Awareness (ISEA) Project phase II. Nearly 80 IT Teachers and Principals of different CBSE schools of Tripura attended the workshop. Dr. Biswajit Saha, Director (Training and Skill Education), CBSE inaugurated the session and Shri Jeetendra Kr. Singh, Scientist-C of NIELIT Agartala delivered on the topic.

Digital Empowerment of School Students

As a part of propagating digital literacy in the state of Tripura, the students SYNOD School, Lefunga, West Tripura are being trained in NIELIT's Course on Computer Literacy. The program was formally inaugurated on 3rd April 2019 in presence of the Principal, teachers, students and the team of NIELIT Agartala.

Industrial Training-Python, Linux, Apache, MySQL

Industrial Training of 150 engineering students from different colleges is being taken up in June 2019 at NIELIT Agartala Campus in various areas including Python, Linux, Apache, MySQL, PHP, JAVA, Routing and Switching, CAD using CREO, Solar Power Installation, Web Designing etc.

News from Calicut Centre

Electronic Board Design and Bring Up

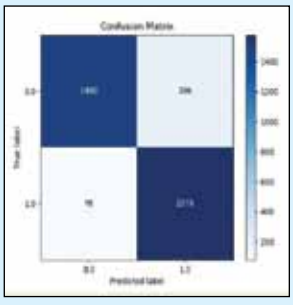
A two days hands on workshop on 'Electronic Board Design and Bring up' was conducted on 27th and 28th April 2019 by NIELIT Calicut in association with IEEE Malabar Subsection and Kerala Chapter of IEEE Computer Society for around 50 participants from industry and academia. The workshop covered hands-on Allegro® PCB Editor. Shri. Gopalakrishnan S, IAS, Joint Secretary, MeitY distributed certificates to the participants.

The Joint Secretary, MeitY also visited NIELIT Calicut Campus and appreciated the infrastructural facilities available at the Centre. He also reviewed the progress in various projects taken up by the Centre.

Innovative Projects by NIELIT Calicut Students

Artificial Intelligence based Projects

- **Fake News Identification in social media:** A tool to detect fake news, based on the text content of the news article. Natural Language Processing, various machine learning and deep learning algorithms were used in its implementation.



- **Daily sales prediction for bakery chain:** It is a tool to predict the demand for the products of a famous bakery chain in Kerala. The previous 5 years data from their MIS was used in its development. Random Forest Regressor algorithm was obtained as the most suitable machine learning algorithm in this task. In addition to the prediction, they could also obtain the association between the product purchases also, so that they can predict how many of different items will be purchased together.

1	Sweet Roll	Dilkush	0.894339
2	Marble Cake 350	Banana Chips	-0.88541
3	Bread 600g	Bread 400g	0.805973
4	Bread 400g	Bread 280g	0.86089
5	Bread 280g	Bread 600g	0.825635

- **Fruit Classification Tool:** It is a tool for classification of fruits from their images. Data Augmentation, Classification using CNN and Transfer Learning etc. were used in their work. They also developed a chat-bot to readout the mineral contents based on the fruit identified.

Embedded System and IoT Based Projects-(usable for Smart City Project)

- **Remote Intelligent Monitoring System :** This is a smart city prototype project. Upcoming technologies like IoT and Artificial Intelligence are being used here. One of the key attractions in this project was the long range sub1GHz connectivity technology LoRa .

  The objective was to design a trouble free and systematic vehicle monitoring system, light automation and water level monitoring system. The system prototype was tested in NIELIT campus. The connectivity also was tested between two buildings separated 1 KM apart.

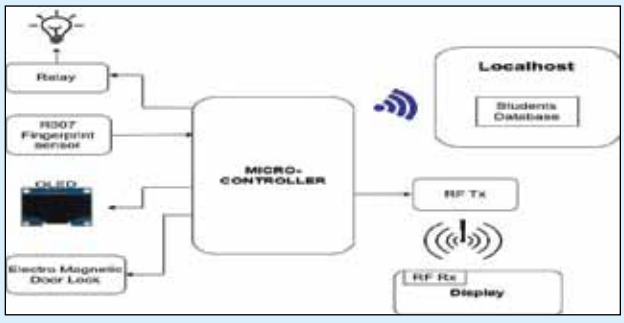
  The project has three units, first the vehicle detection Unit captures the vehicle details and maintains the data in a server. AI was used for this phase. The second unit Water level monitoring system, was used to monitor the water level of over headtanks . The distance between tank and the monitoring station can be up to 10 KM line of sight. The third phase integrated a multi controllable light unit and which can be operated with traditional switches, with the help of mobile phone App or from internet connected computers. The status of the light and the previous history will be recorded in the server.

  This multi dimensional prototype has huge demand in the upcoming future in different areas like smart city, smart water monitoring, smart environment monitoring, Industrial IoT and Industrial 4.0 based applications etc.

- **Smart Shoe for Women Safety:** Now a days, women and children safety is a prime issue of our society. Many unfortunate incidents are taking place. Nowadays mobile phone is used by almost everyone to keep in touch with family and friends. "Smart Shoe for Women Safety", focuses on a security system that is designed solely to serve the purpose of providing security and safety to women so that they never feel helpless while facing social challenges.

  This proposed model uses a microcontroller with sensor placed inside the women shoe and an Android Application specially designed for Safety of Women. This app can be activated by a single click of button in app, whenever need arises. All that of women needs to do is that whenever she is in danger she need to just remove the shoe and app identifies the location of place through GPS and sends a message comprising instant location to the saved contacts and also calls to all the saved contacts to help the one in dangerous situations. The unique feature of this application is that user can modify and save the contact number and call and message will be send to all contacts every five minutes for three times. And also rechargeable battery is provided for controller, in order to provide power supply.

- **Biometric Attendance & Entry Control with Automation:** The system adopts the usage of biometric fingerprint reader for students to mark attendance for



the classes attended. In the system a microcontroller based system provides biometric authentication and recording attendance of students in a database stored in local server. A local area network web platform integrates student attendance record information and message input to wireless digital display. The project integrates all these features along with intelligent automation of lights into a single platform.

The biometric sensor is used to provide restricted entry into lab by granting access only for authenticated individuals. It ensures lab security by monitoring the individuals entering and leaving the lab. The total count inside the lab is maintained and this allows intelligent automation features including turning off lights and fan when no one is present inside the lab. Other features include a wireless digital display controlled from local server webpage to notify important messages in the lab.

News from Chandigarh Centre

Collaboration with IIT Ropar-Big Data, IoT, Raspberry Pi

Various courses on emerging technologies like Big Data Analytics using Hadoop, Python with Data Science and Machine Learning, Internet of Things (IoT), Raspberry Pi with Python have been launched at NIELIT Chandigarh in association with IIT Ropar. In this regard, different lectures on Big Data, IoT, Machine Learning, Data Mining & Analytics etc. have been conducted at NIELIT Chandigarh.

IoT with Augmented Reality

A new course on Internet of Things (IoT) with Augmented Reality' has commenced in June for the 2nd and 3rd year students of B. Tech in which a total of 13 students from various Government and private engineering colleges have been trained.

Counselling Program for School Students

A mass counselling program to generate awareness about various capacity building courses offered by NIELIT was conducted by NIELIT Chandigarh in collaboration with Local Employment Exchanges for around 760 students of various Government Higher Secondary Schools.

Counselling Website for School Admission

NIELIT Chandigarh has designed and developed a website for Department of Education, Chandigarh Administration for counselling the students who are taking admission to 11th class. The project is totally paperless and the first round of counselling was done in June, 2019 through which approximately 15000 students were given admission in 40 government schools of Chandigarh.

Success Stories...

Ganji Vijaya
M.Tech. in Electronics Design Technology
Intern at ROBERT BOSCH

"NIELIT Calicut is one of the best institutes for M.Tech. course. Most of the class time we spend in LAB, doing practical works related to C, C++, Python, Linux programming, ARM cortex M3, M4 programming, Matlab, and Arduino programming. Labs are equipped with latest technology. NIELIT faculties are friendly, well experienced and helpful. NIELIT Calicut has very efficient and active placement cell for the placement training, assistance and selection process, which has really helped me in getting the position at Robert Bosch"

Hariharan K
M. Tech. in Electronics Design Technology
Intern at Robert Bosch

"NIELIT Calicut is one of the Best Central Government Institutes to pursue M.Tech. under Electronics specialization. Best part about NIELIT Calicut is the teaching faculty who are experts in both industrial as well as theoretical concepts. Half of the weekdays we spent our time in Labs that are well equipped with standard software & hardware resources for doing practical works that helped me a lot in recruitment drive. More importantly, the learning atmosphere is awesome. NIELIT Calicut Placement Team was very supportive on conducting trainings and tests. Placement preparation guidance. Motivation by senior's interaction helped me a lot in attending interviews in top core companies."

Athira Sreekumar
M.Tech. in Embedded Systems
Intern at Intel

"Right from the time I started searching for colleges for doing M.Tech., NIELIT was my first preference. NIELIT reputation among other colleges and feedback of acquaintances who were it's ex- students caught my attention. NIELIT fulfilled my expectations due to its excellent lab facilities and practical oriented curriculum which helped me in improving my knowledge and skills. All the faculties here have excellent knowledge and they are always ready to help. NIELIT helped me to transform in both technical as well as personal aspect. My sincere gratitude to all the faculties and placement cell for helping me to grab such a good opportunity which accelerated my career growth."

Dona Maria James
M. Tech. Embedded System
Intern at Intel

"Taking masters from NIELIT Calicut in Embedded Systems was one of the best decisions of my life. The ambience in here offered an industrial experience. The curriculum in here is designed in such a way that students are offered more lab experience. Faculties with immense knowledge had helped me to achieve this remarkable achievement, with proper training and guidance."

Vikram Singh Bisht
M.Tech. in VLSI and Embedded Systems
Intern at Intel

"NIELIT has given me the opportunity to work with one of the best companies in VLSI domain under SMDP-C2SD. The lectures by the faculty of NIELIT has helped me a lot in gaining knowledge in the field of VLSI. The laboratories of NIELIT are equipped with latest EDA tools. Working in such a environment has helped me to clarify concepts which otherwise were only theoretical."

NIELIT CENTR

Extension Centres: Dibrugarh, Jorhat, Kokrajh

The Centre was established in the year 1998 (as erstwhile 'Centre for Electronic Design and Technology' -CEDT) at Tezpur University Campus. With the merger of CEDTI's with DOEACC Society in December 2002, the centre came to be known as DOEACC Centre Guwahati/ Tezpur and later renamed as NIELIT Guwahati in October 2011. With the support of MeitY in 2012, 4 (four) new Extension Centres were developed at Dibrugarh, Jorhat, Kokrajhar and Silchar in Assam. At present, construction of permanent campus of NIELIT Extension Centre is in full swing Dibrugarh, Jorhat, Kokrajhar and Tezpur where Govt. of Assam has provided free land to NIELIT. The permanent campus at Kokrajhar is ready for handover within 2-3 months while the same at Tezpur, Jorhat and Dibrugarh are expected to be ready by December 2019. In October 2018, as per the directive from MeitY, a Study Centre was commissioned at Majuli, the largest river island in India.

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AREAS OF EXCELLENCE

- Networking and Information Security
- Data Science and Machine Learning.
- Medical Electronics
- Bioinformatics
- ITeS-BPO

Area for Faculty Development Programmes:

- IoT
- Artificial Intelligence and Machine Learning.
- Big Data Analytics
- Applied Bioinformatics
- Mathematical Physics using Scilab and Matlab.

COURSES OFFERED

SHORT TERM COURSES :

Certificate Courses (NSQF Aligned):

- NIELIT 'CCC'
- Web Designing
- Office Automation
- Linux, Apache, MySQL & PHP
- PC Assembly and Maintenance
- DSP using MATLAB
- Android App Development
- Telecom Technician – PC Hardware & Networking
- Data Entry and Office Automation
- System Administration using Linux.
- Network Specialist.

Diploma & Advanced Diploma:

- Advance Diploma in Computer Application, Accounting and Publishing.
- PG Diploma in Software Technology
- Advance Diploma in Java Enterprise Edition

LONG TERM COURSES :

Certificate Courses (NSQF Aligned):

- NIELIT O/A/ Level in IT and CHM-O Level in Hardware & Maintenance

RE GUWAHATI

ar, Tezpur and Silcar **Study Centre: Majuli**

HIGHLIGHTS & ACHIEVEMENTS

Capacity Building of Assam Government Employees sponsored by DoNER

Ministry of DoNER, Govt of India entrusted NIELIT with the responsibility to train 10,000 State Govt employees in the North Eastern Region (NER) on IT and Digital Services (Including Digital Payments and GST). Under this project, NIELIT Guwahati along with its seven Extension Centres across the state of Assam has trained a total of 6838 Assam Government Employees.

Medical Electronics Project:

Silchar Extension Centre of NIELIT Guwahati is executing a project on "Set up of Medical Electronics Laboratory" cofounded by MeitY, Govt of India. Under this project the Govt./Non-government medical institutions/nursing homes shall be getting consultancy from Silchar Centre for any repair/maintenance works in medical equipment. With this view, a 200 hrs. course on "Repair and Maintenance of Medical Electronics Equipment" is started from November 2018.

Training to Police Personnel, for capacity building of Cyberdome Project of Assam Police

NIELIT Guwahati and its extension centres at Dibrugarh, Jorhat, Kokrajhar, Silchar, Tezpur in Assam has successfully trained 245 Police Personnel from Special Branch of Assam Police during February-March 2019 under sponsorship of Department of Police, Govt. of Assam.

Capacity Building for VARTAK - An Engineering Wing of Indian Army:

NIELIT Guwahati Tezpur Extension Centre is offering training courses in IT for the Officials of VARTAK, an Engineering Wing of Indian Army since last four years.

Consultancy Services: Website Development

NIELIT Tezpur Extension Centre designed & developed an Informational website of North Eastern Regional Institute of Water and Land Management (NERIWALM) with the domain name "http://neriwalm .gov.in/".

TECH वार्ता

Designing aspects of local Data Warehouse for Data Analysis and e-Services

1. Introduction: In this era of Big data, IoT and social media, it is difficult to store and manage extensive growing data. However, data are to be controlled concerning the time, space and efficiency. Hence the multiple dimensions of the data are used to store and retrieve data. A Data Warehouse (DW) is used to store the consolidated data from a variety of sources and to support strategic and decision making of any business [1]. Online Analytical Processing (OLAP) is used for faster query execution. Most of the Government departments and institutes provide lots of e-services for the benefits of the citizen. Slow internet facilities and lack of 24 hours electricity, especially in rural areas, does not motivate the citizen to use the e-services. Today, every firm interested to have its DW to support strategic, decision making for the business, and understand their customer. Most of the DW system or applications were designed targeting the multinational firms. Affordable firms customize as per their requirement with expenses and yearly subscription fees. Here rise the needs of developing an open, easily customizable Local data warehouses and providing it to all the needy firms.

2. Current national status: The Govt. of Andhra Pradesh executed a project, 'Data warehousing', in which C-DAC developed citizens database (Voters List, Food and Distribution, Industry, Professionals, Household data, Health, Economic Status and Demographic data etc.)[2]. A system 'eVidur' is available for tracking social media data with the facilities of auto analysis and interpreting the data to capture the sentiment of the citizen. It helps to track people's views on development agendas or policy initiatives by the government to take corrective measures. There are some seasonal research works on this topic from many universities.

3. Current problems and significance of the study: Data warehouse or OLAP system usually are costly for small firms [3]. Other forms of OLAP are Multidimensional OLAP (MOLAP), Relational OLAP (ROLAP) and Hybrid OLAP (HOLAP). HOLAP is useful for data management-data modelling, fast searching, optimisation purposes. HOLAP can be incorporated for Data analytics purposes to support the business of small institutes or firms [4,5]. Available e-services are not reachable to all target users but only to a specific location. So to enable offline usages, an affordable and customizable data warehouse with advanced facilities is required for all level institutes. The data available from the real field are not clean to process for data analytics or provide auto e-services. Some designing aspects are provided below.

4. The methodology of Design: Some sample setups and activities are provided.

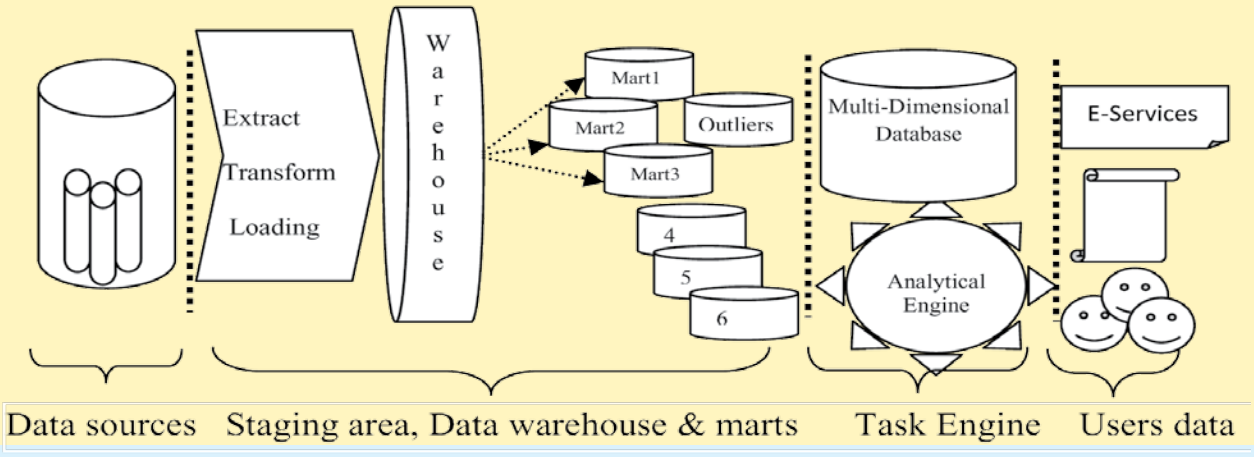
i. Design of a primary Data warehouse

a. The data source: The data are being collected from different sources. The error data are separated.
b. The staging area: Data Storages, data warehouse and data marts.
c. Task Engine: It is developed to the applied set of rules that may support MOLAP and ROLAP operations.
d. User's data: The filtered data are going to be used for Data analytics or auto e-service purposes.

ii. Design of ETL process and Data warehouse system

a. Extract: Extracting the data from the source systems, (different data organisation or format).
b. Transform: Series of rules or functions applied to extracted data.
c. Load: Loading the data into the data warehouse using the surrogate key.

This ETL requires several steps to give a successful DW with its benefits. More detail is available in the article of the



author 'Easy designing steps of a local data warehouse for possible analytical data processing, to appear in ADBU Journal of Engineering Technology, 2019 [6]

5. The benefit of such local warehouse system

a. Solutions to Data quality problems
b. Automatic warehousing process (less human intervention).
c. Energy-efficient OLAP that support the optimisation of query response time.
d. A local HOLAP system to use for a small business even in the offline mode.
e. DW System that can enable Data analytics, reporting and e-services to its customers

6. Conclusion

Research work on developing an open, easily customizable Data warehouse with the benefit of OLAPs will help the firms and govt. departments to understand their business and their customers. Several energy-efficient algorithms can also be implemented for such a system for a better future.

7. References

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Digital India – enriching Citizen Centricity

Like private business houses, Government should believe in the virtue 'Customer Centricity' despite its existence as natural monopoly. Such monopoly is some way not only questioned by people but even challenged by small proactive attempts of some individuals or organizations. As an example, many Mobile Apps on airlines carrier status developed and operated by private individuals/companies are giving more precise & updated information to travelers then the electronic boards at Airports operated by airport authorities. Such examples are enough in terms of reasoning to question Government by citizen. Right and correct information from unofficial sources put a right challenge and edge over the official information source insensitive to public needs.

Quote *"It is not the job of customers to know what they need"* by Steve Jobs indicates straight towards citizen centricity by knowing rather foreseeing their needs&expectations. Public sector is always rich in experienced human capital as enjoying low attrition rate. Every experienced insider is well aware about the public needs while lacking in meeting those needs.

Government Programmes for knowing public needs & expectations and for public participation in decision making, will be more relevant once system has attained sufficient maturity after improvisation and re-engineering.

If we start believing Steve Jobs quote , Government sector is equally qualified as far as need assessment is concerned, while lacking in quality of service (QoS). This sector should learn virtue of 'Customer Centricity' from private business houses where outside-in view is equally important to inside-out view.

Insiders should start viewing scenario in this order -*Citizen Expectation [Outside] then Quality of Service(s) [Interaction] and then to Process [Inside] - rather than the usual order of view - Process [Inside] to Quality of Service(s) [Interaction] and then to Citizen Expectation [Outside].*

Outside-in view of public sectors triggers out-of-box thinking and enable focus on quality of service delivery first to meet citizen expectation followed by process simplification, improvisation or re-engineering. At this level, need of prioritization also arises in respect of available resources (including time); political intents (in democracies, it is always considered aligned with public needs as leadership is acquired through competition and someway based on or focused for political mileage); level of natural resistance for change; intentional resistance by some insiders as arises due to threat to monopoly.

During process simplification & re-engineering, best use of technology should be worked out in a way to eliminate at least those boundaries which have been developed in & around Government Processes by virtue of accommodating exceptions and has resulted as constraints to comply with. Focus should be on final services which are consumed by citizen directly like 'Permit to open an eatery house', 'Issuance of Driving Licenses' etc. Delivery of mid-stage services to citizen should be eliminated as these are consumed by a process for delivery of final services. As an example issuance of Cast Certificate is mid-stage service which in turn is a support service for process offinal service like 'getting social benefits for specific cast/category'.

In the absence of technology, only limited way of sharing information among government functions was through paper document like certificates and default information carrier was that individual who is issued with this information document entitling him/her for availing some final service.

Digital India programme by using present Technology & its applicability vide Digital Locker, e-Authentication, enhanced Internet availability, online integrated systems for public services, enhanced level of Digital Literacy sets right environment for efficient, effective, transparent governance. EICT infra developed in line with Digital India is proving its capability and is being leveraged for sharing data or information instantly across work functions in a seamless way. System of systems-back to back integrated, interoperable, converging at front end with paramount QoS-which are the need of day, are coming up with multiple competing fronts of service delivery with substantial add on to citizen centricity.

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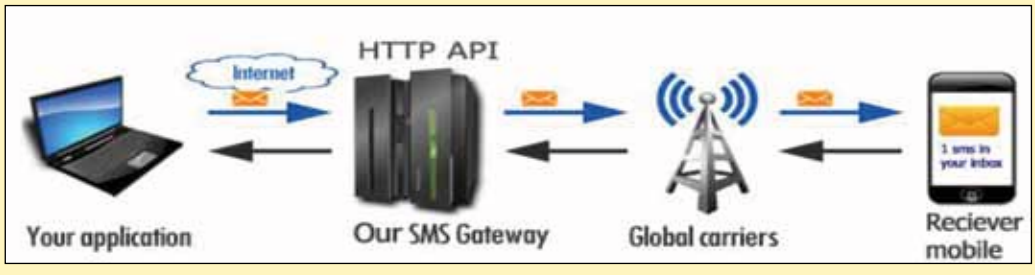
SMS Integration in a Web Application

The mobile device has become an integral part of our lives and is very useful for many of our activities. For example, online payment transactions for shopping, bill payments, NeFT cannot be done without a mobile as the authentication OTP's are sent on the mobile which is required to complete the transaction. Many other services like online booking of tickets, ATM transactions etc. immediately send SMS to our mobile device.

In this article, let us try to understand how a web application sends out SMS on a mobile device. At first, we should realize that there are two separate networks here, the **Internet** where the web application runs and the **mobile/telecommunications** network on which the SMS are sent. No amount of code in a web application in any programming language can by itself send an SMS to a mobile device. The web application code for sending SMS should have access to the second network i.e. the mobile/telecommunications network because the actual SMS is sent on this network and the web application code is only a trigger for sending the SMS on the mobile network. It is therefore obvious that there has to be an integration/amalgamation of the two networks mentioned above and an **SMS Gateway** service performs this particular role.



This gateway computer has access to both the networks mentioned above. It takes the trigger for sending the SMS from the web application running on the Internet and then it does the sending of SMS on the mobile network. So here we understand that the trigger for sending SMS is coming from the Internet through the web application and the actual SMS is sent on the cellular network by the gateway computer which has access to both the Internet and also to the cellular/telecommunication network. The SMS gateway server makes its service (for sending SMS) available in the form of an HTTP Application Programming Interface (API) to be used by the web application. The software code in the web application is programmed as per the requirements of the API of the SMS gateway server so that the web application becomes a trigger to send SMS by the gateway server. The programming for the API can be done in any programming language like Java, C#, PHP, Python etc.

It is to be noted here that to send SMS from a web application, the SMS Gateway service has to be separately purchased from gateway providers and has to be integrated with the web application. The SMS gateway server sends two types of SMS notifications – **Promotional** and **Transactional**. The promotional SMS sent does not guarantee delivery if the user has **Do Not Disturb** service **(DND)** enabled on his mobile, which is usually the case for most of the users. The transactional SMS sent by the gateway server bypasses DND and is guaranteed to be delivered. However, a template

of the transactional SMS to be sent to the users has to be first approved by the SMS gateway provider (due to telecom regulations) which can be done online on their gateway servers. When the service is purchased from the SMS Gateway provider, a login account is created by the provider for a particular user and SMS credits are transferred to the user account as per the number of credits purchased. The SMS credits get deducted upon sending the SMS from the user account either programmatically by the web application or by using the web interface provided by the SMS gateway service provider. The SMS credits are required to be topped up again when exhausted or before just like a prepaid mobile recharge. In addition to the SMS credits, the API is also provided to the user which is used by him in programming the web application to send SMS.

For example,an HTTP APIprovided by gatewayserver.com (for example) to send simple plain SMS using query string parameters can be as below-

http://api.gatewayserver.com/api/sendsms/plain?**user**=test&**password**=test&**sender**=Friend&**SMSText**=messagetext&**GSM**=919867565432

user	Username (provided by SMS gateway provider)
password	Password (provided by SMS gateway provider)
sender	Message sender name Alphanumeric sender: max. length 11 characters Numeric sender: max. length 14 characters
SMSText	Message text (160 characters)
GSM	Recipient GSM number in international format (91988xxxx, 91981xxxxx, ...)

The web application code in any programming language will have to programmatically construct the above HTTP API string URL and make an HTTP call to the gatewayserver.com. If the entire query string parameters are without any error, then an SMS will be sent by the web application to the number mentioned with the **GSM** query string parameter.

There are also many other services provided by an SMS Gateway provider like short/long code services, missed call alert, web server push/pull among others. SMS Gateway providers nowadays have booming business due to the requirement of sending SMS notifications for a variety of purposes by differentcategories of users for their online business/activities.

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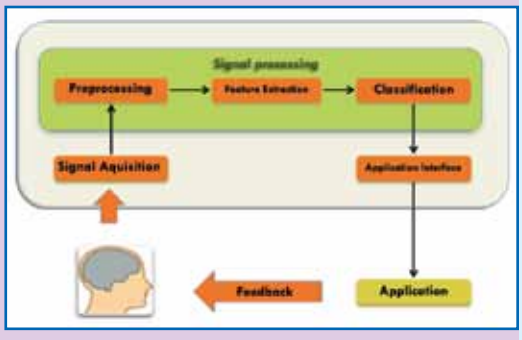
Virtual Reality (VR) w.r.t Brain-Machine Interfaces (BMI)



The optimized interface between machines & humans could be through straight sensing and stimulation of sensory neurons. One step in this direction is to extract physiological measures, rather than using them to explore Virtual Reality Sickness, We could apply measures such as heart rate, galvanic skin reactions and respiration to adjust the VR experience lively. Other goals such as fear, comfort, relaxation & excitement would be optimized accordingly.

The technology we could apply is designed to read the firings of sensory neurons so that the VR system responds to it by amending the visual & auditory displays. The users can learn that specific thoughts which have a corresponding effect in VR, resulting in mind control.The powers of neuroplasticity and perceptual learning could enable them to comfortably & efficiently move their avatar bodies in the virtual world. It might buzz like pure science fiction, but substantial progress has been achieved. For example, monkeys have been trained by neuroscientists at Duke University to drive wheelchairs using only their conviction. In the field of brain-machine interfaces (like **BMI**, Brain-Computer Interfaces or **BCI**), many other experiments have been performed, which connect humans and animals to mechanical systems and VR experiences via their conviction.

Measurement methods:

The goal of devices that evaluate neural activity is to interpret the voluntary objectives and decisions of the user. The two categories which can measure neural activity are: **non-invasive** (attaching sensors to the skin is allowed) and invasive (rehearse into the skull is allowed). First let us consider the **non-invasive** case, which is by far the most suitable for humans. The most accurate way to quantify full brain activity to date is by functional magnetic resonance imaging (**fMRI**), which is related to **MRI**, where most people are familiar with the conventional medical scanning method. Routine MRI disagrees in that it furnishes an image of the static structures to identify abnormalities, whereas an fMRI furnishes an

image that depicts activities of parts of the brain over time. Woefully, **fMRI** is too slow, overpriced, and cumbersome for everyday use as a VR interface. Furthermore, users must remain rigidly fixed, and sometimes they ingest a dye that escalates contrast due to variations in blood flow.

Thus, the most common way to evaluate brain activity for BMI is via electroencephalogram (EEG), which involves placing electrodes along the scalp to quantify electrical field fluctuations that stem from neural activity. The signal-to-noise ratio is woefully poor because the brain tissue, bone and skin productively perform low-pass filtering that destroys most of the signal. There is also remarkable attenuation and interference with other neural structures. The transfer rate of statistics via EEG is between 5 and 25 BPS.It is roughlyequivalent to one to a few characters per second, which is two orders of magnitude slower than the average typing rate.Extracting the information from EEG signals involves complicated signal processing. Open-source libraries exist, such as OpenVibe from INRIA Rennes. For the invasive case, electrodes are implanted intracranial (inside of the skull). Which provides many more statistics for scientists but is restricted to studies on animals (and some humans suffering from neural disorders such as Parkinson's disease). Thus, invasive methods are not suitable for the vast majority of people.

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M2M Communication using MQTT

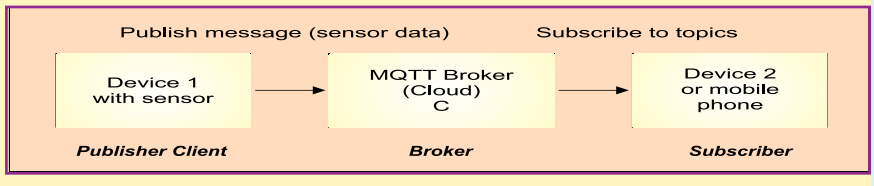
I had implemented MQTT for transmission of sensor data between Raspberry Pi 3B and a smart phone. Temperature and humidity data of a room are sampled using DHT11 sensor connected to Raspberry Pi. These sampled data can be monitored using a smart phone from anywhere. Steps for implementing MQTT are given in this article.

MQTT (Message Queuing Telemetry Transport) is a lightweight transport layer protocol designed for M2M (machine to machine) communication and is suitable for resource constrained IoT devices. It is publish/subscribe messaging transport that needs no pairing between the communicating devices. Devices publish messages to a central broker and the broker delivers messages to the subscriber devices.

As shown in the fig. 1, both publishers and subscribers are treated as client applications. The MQTT broker or cloud in the middle works as a message dispatcher ensuring that the MQTT messages are properly sent from the client publishers to the correct client subscribers. One Publisher client program in device 1 puts the sampled sensor data onto the cloud (Broker) through Topics (given in example) and subscriber client program in device 2 receives the subscribed data through the same Topics from the cloud. In my MQTT application development, Raspberry Pi acts as publisher and smart phone as subscriber. I used free cloud **iot.eclipse.org** as broker.

Brokers: Some of the available free online brokers are:

1. test.mosquitto.org
2. broker.hivemq.com
3. iot.eclipse.org



Blocks in MQTT

Implementation of MQTT in Python:

The MQTT Client in Python: The Client library is the **client class** which provides all of the functions to publish message and subscribe to topics. The MQTT client class has several methods. The main methods are:

- connect() and disconnect()
- subscribe() and unsubscribe()
- publish()

Steps for developing a simple python program using MQTT is described with comments:

1. **Importing The Client Class:** To use the client class you need to import it. Use the following:
   Import paho.MQTT.client as MQTT

2. **Create an instance use:**
   client =MQTT.Client(client_name)e.g. client =MQTT.Client()

3. **Connecting To a Broker or Server**
   Before you can publish messages or subscribe to topics you need to establish a connection to a broker.
   To do this, use the connect method of the Python MQTT client.
   Out of four parameters normally used, only three parameters i.e. broker name, IP address and keepalive (duration) are used in this example.
   client.connect ("m2m.eclipse.org",1883,60), where, 1883 is the standard port for MQTT

4. Publishing Messages

Once you have established link you can start to publish messages.
To publish messages we use publish method
The publish method accepts four parameters.
Only the parameters that have to be provided are given within the example:

The general syntax is:

client.publish("house/living-room/light", "ON")

Where, **"house/living-room/light"** is the multilevel topic and **ON** is the payload. The Payload can be a data string read from the sensor.

The following is a short program to publish a message:

The script below publishes the message **OFF** to topic **house/living-room/light**

```
Import paho.MQTT.client as MQTT                    #import the client
broker_address=" iot.eclipse.org "
client=MQTT.Client("P1")                           #create new instance
client.connect(broker_address)                     #connect to broker
client.publish("house/livingroom/light ","OFF")    #publish
```

5. Subscribing To Topics

To subscribe to a topic, you use the subscribe method of the Paho MQTT Class object. Subscribe method have two parameters, only one parameter is used in the example below:

client.subscribe("house/living-room/light ")

The script below subscribes to topic ***house/living-room/light***

```
import paho.MQTT.client as MQTT                    #import the client
broker_address=" iot.eclipse.org "
client=MQTT.Client("P1")                           #create new instance
client.connect(broker_address)                     #connect to broker
client.subscribe ("house/living-room/light ")      #subscribe to the topic
```

Reference: Beginners Guide To The Paho MQTT Python Client
http://www.steves-internet-guide.com

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Publication List from NEILIT Staff and students during (May, June, July 2019)

1. **Munivel E** and Kannammal, A, "New Authentication Scheme to Secure against the Phishing Attack in the Mobile Cloud Computing," Security and Communication Networks, (May 2019), [SCIE, Impact factor (IF)-1.067).

2. **Munivel E** and Kannammal, A, "Secure Authentication Protocol for Efficient Computational offloading Service in the Mobile Cloud Computing", Journal of Internet Technology, (June 2019), [SCIE, IF-1.301]

3. Y. S Singh, Y. K. Singh, N. S. Devi, **Y. Jayanta Singh**. "Easy designing steps of a local data warehouse for possible analytical data processing." ADBU Journal of Engineering Technology 8 (July, 2019). [UGC CARE list]

4. **Sourav Das**, Anup Kumar Kolya, and Dipankar Das. "Optimizing Social Media Data Using Genetic Algorithm", in Metaheuristic Approaches to Portfolio Optimization. IGI Global, 126-153. (June, 2019)

5. Ajay Dutt, M. Syamala Devi, **Manish Arora**, Design of UID based Online Census System for Electronic Governance Applications, International Journal of Emerging Technologies and Innovative Research, Vol. 6(5), May 2019.

6. Vikas Kumar Garg, Ashish Oberoi, **Manish Arora**, A Novel Approach for Performance Analysis of Dynamic Information Integration, Journal of Advances in Shell Programming Vol. 6(1)

7. Ajay Dutt, M. Syamala Devi, **Manish Arora**, Unique Identification Based Online Census System for Electronic Governance, EROPA Bulletin, the official newsletter of The Eastern Regional Organization for Public Administration (EROPA), Jan-Aug 2019, Vol. 40, NOS.1-3

8. **L. Shyam Sundar Singh**, Anil K Ahlawat, Kh. Manglem Singh, T. RomenSingh , Y. Subhaschandra Singh, Medical Image Enhancement using Fuzzy and Regression based Neural Network Approach, in International Journal of Applied Engineering Research ISSN 0973-4562 Vol14(7) (2019) pp. 1532-1538 (April 2019.)

9. Shabeeba PT, Mohamed Shahin T, **Pillai MP**, Jemshihas A P "Role of printed Circuit Board Copper Clad Current Collector in Super Capacitor Application", Journal of Electronic Materials, (June 2019)

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#	Course Name	NSQF Level	Duration (Hrs)	Eligibility
				COURSES IN INFORMATION
DIGITAL LITERACY COURSES				
1	Course on Computer Concepts (CCC)	3	80	10th pass
2	Course on Computer Concepts Plus (CCC+)		126	10th pass
3	Awareness in Computer Concepts (ACC)		20	No minimum qualification is required
4	Basic Computer Courses (BCC)		36	No minimum qualification is required
5	Expert Computer Concepts (ECC)		200	12th pass
NON - FORMAL COURSES				
1	O level	5	480	12th pass or ITI Certicate after class 10.
2	A level	6	1550	'O'/ -Level or polytechnic engineering diploma after 10+2/ Graduate
3	B level	7	4150	Level 'A'/ PGDCA/ polytechnic engg. diploma/ Graduate
4	C level	8	2700	Level 'B'/ B.Tech/ BE/ MCA/MBA/ M.Sc/ M.A/B.A in Maths or Statistics
5	Diploma in Multimedia and Animation Technology (O Level)	5	720	12th Pass
OTHER COURSES				
1	Certificate course in Office Automation(CCOA)	3	80	12th pass
2	Certied Course in Web Designing	3	80	Basic Computer Knowledge
3	Advance Diploma in Computer Application Accounting & Publishing	4	200	12th Pass with knowledge of Basic computer and Internet
4	Certified Android Apps Developer	5	100	Graduate/ Undergraduate and knowledge of Java, Internet & Database
5	Certified Graphic Designer	5	80	12th pass
6	Certified Audio Visual Designer	5	80	12th pass
7	Certified 2D Animator	5	80	12th pass
8	Certified Multimedia Developer	5	200	12th pass
9	Certificate Course in Linux, Apache, MySQL and PHP	5	80	B.E./ B.Tech/ NIELIT A Level/ BCA or Its equivalent
10	Advance Diploma in Hardware, Networking & Information Security	5	1220	12th pass/ 10th pass + ITI/ Graduate
11	Networking Specialist (NS)	6	780	12th pass/ Undergraduate/ Graduate having basic computer knowledge
12	Certificate Data Scientist	6	240	Graduate/Under Graduate and knowledge of any computer language
13	Advance Course in Web Application Development using LAMP	7	240	B.E./ B.Tech/ NIELIT A Level/ BCA or Its equivalent
14	Certificate Course in System Administration using Linux	6	80	B.Sc.(CS)/ BCA/ PGDCA/ Diploma(CS/ IT)/ NIELIT 'A' Level (s/w)
15	Certificate Course in System Administration using Unix	6	80	B.Sc (C.S)/ BCA/ PGDCA/ Diploma in (CS/ IT)/ NIELIT 'A' Level (s/w)
16	Advanced Diploma in Java Enterprise edition (JEE)	6	420	Diploma in Engg/ Bachelor's in Science/ Technology/ Computers or any graduate course
17	Certificate course in Reliability	6	240	Persuing B.Tech
18	Advanced Diploma in .Net Technology	6	420	Diploma in Engg. Bachelor's Degree in Science/ Technology/ Computers or any graduate
19	Certificate Course in Cyber Forensic	6	500	Graduate in Science/ Engineering Stream
20	PG Diploma in Software Technology	8	840	BE/B.Tech/ MSc/BSc (IT/Computer Science/Electronics), MCA /BCA, PGDCA
21	Certificate Course in Data Entry and Office Automation	4	135	12th pass with min 50% marks OR ITI after class 10th with min 50% marks
22	PG Diploma in Cloud Computing	8	840	BE/B.Tech/ MSc/BSc (IT/Computer Science/Electronics), MCA /BCA, PGDCA
23	Advanced Diploma in Android Application Development	6	420	Diploma in Engg./Bachelor's Degree in Science/ Technology/ Computers/any graduate
24	Certified Cloud Computing and Virtualization Expert	6	210	3 yr. diploma/Undergraduate with knowledge of any computer language
25	Advanced Diploma in Bigdata Analytics	7	480	3 year diploma/ Graduation in Science/ Commerce/ Statistics/ Engineering or equivalent
26	Certificate course in CAD using CREO	5	100	B.Sc.(CS)/ BCA/ PGDCA/ Diploma(CS/ IT)/ NIELIT 'A' Level (s/w)
				COURSES IN ELECTRONICS
NON - FORMAL COURSES				
1	Diploma in Computer Hardware Maintenance (CHM - O Level)	4	400	12th pass/ ITI/ Diploma/ Graduation/Post-Graduation
2	Adv. Dip. in Computer Hardware Maintenance & Networking (CHM– A Level)	5	470	CHM 'O' levelor Diploma/ B.Sc

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COURSES OFFERED

#	Course Name	NSQF Level	Duration (Hrs)	Eligibility
OTHER COURSES				
1	Certificate Course in PC Assembly & Maintenance	3	80	10th pass
2	Certificate course in Arduino based Embedded System Design	4	300	Dip. in Electro./Commun./ Electrical/ Biomedical/ Computer/ IT etc./B.Sc in Electronics
3	Solar Power Installation, Operation and Maintenance	4	80	12th pass/ Diploma/ Graduate
4	Diploma in Installation & Repair of Consumer Electronics Products	4	350	ITI or 12th pass
5	Repair & Maintenance of Power Supply, Inverter & UPS	4	350	12th pass / ITI
6	Post Graduate Diploma in Internet of Things	7	470	M.E/ M.Tech/B.E./ B.Tech in Electronics/ Electrical/ Instrumentation/ Biomedical/IT etc.
7	Advance Diploma-PLC/SCADA/DCS Engineer	5	360	Diploma (Electrical/Electronics) /M.Sc (Electronics)/ B.E /B.TECH (Electrical/ Electronics)
8	Post Diploma in Electronics Product Design	6	1598	3 years Diploma in Electronics/ Electrical/ Computer/Instrumentation or equivalent
9	PG Diploma in Embedded System Design	6	840	B.E/B.Tech/ M.Sc/ B.Sc/ 3 Year Diploma in IT/ Electronics), MCA/ BCA
10	Repair & Maintenance of ECG and ICCU equipments	3	300	10th Pass
11	Repair & Maintenance of Imaging Equipment (X-Ray & Ultrasound machine)	3	300	10th Pass
12	Repair & Maintenance of Dental Equipment	3	300	10th Pass
13	Certificate Course in Electronic Product Testing	3	360	10th/ 12th Pass with Science background
14	Certificate Course in VLSI Design	5	80	Engineering Degree [ECE/ EEE/ CSE/ AEI] (Undergoing also)
15	Assembly & Maintenance of Personal Computer	3	240	10th/12th/ ITI/ Polytechnic Diploma/ Graduation
16	Solar-LED Lighting Product (Design and Manufacturing)	4	350	10th/ ITI/12th
17	Installation Repair and Maintenance of Home Appliances	4	350	10th/ITI / 12th Pass , non Science graduates
18	Telecom Technician- PC Hardware and Networking	4	350	10th pass
19	Installation & Maintenance of Photocopiers and Printers	2	200	10th pass/ ITI
20	ESM - 1 Electronic Production Technician	4	360	10th /ITI/ 12th year of Schooling
21	Certificate in Robotic Programming and Maintenance	4	325	10th/12th pass
22	Automation Technology-Basic Level	4	240	Diploma in/ Electronics/ Instrumentation/ Mechanical/Electrical
23	ESD –1 Electronics Product Design Support Engineer	5	432	Diploma in Electronics/ Electrical/ Mechanical/ BSc. Electronics
24	ESM– 2 Electronic Product Supervisor	5	442	Diploma in Electronics/ Electrical/Mechanical
25	3 D Scanning and CNC Routing Engineer	5	400	Engg. Diploma holder or B.Sc. Graduate and not less than 18 years of age.
26	Additive Manufacturing /3D Printing	5	400	Engg. Diploma holder or B.Sc. Graduate and not less than 18 years of age.
27	Automation Technology-Advanced Level	5	515	3 year Diploma in Electronics/ Instrumentation/ Mechanical/Electrical/ Graduates
28	Embedded System Design using 8-bit Microcontrollers	5	400	3 Year Diploma in Electronics/ Communication/Electrical/Instrumentation
29	Post Diploma in VLSI Design,Tools and Technology	5	400	Diploma Holder,B Sc. Graduate
30	Dip. in Repair & Maintenance of Industrial Instrumentation & Automation Sys.	5	400	ITI/ Diploma / BSc
31	Post Diploma in Repair and Maintenance of Hospital Equipment	5	400	Diploma, B.Sc
32	PG Diploma in Industrial Automation System Design	8	840	BE/ B.Tech in Electrical/ Electronics/ Instrumentation/ Chemical Engineering etc.
33	Certificate course in EMI and EMC for Electronic Product Design	6	600	Bachelor's Degree in Electronics Engg. / Electrical/Communication Engineering etc.
34	Certificate Course on PCB Design, Analysis & Manufacturing Techniques	4	250	Diploma/ B.SC in Electronics/ Telecommunication/ Instrumentation/ Electrical
35	Certificate programme on system Verilog and UVM	7	320	B.E/B.Tech/B.Sc/MSc/Engineering Graduates
36	Certificate Course in DSP using MATLAB	7	80	Engineering Degree [ECE/EEE/CSE/AEI] (Undergoing also)
37	Advanced Diploma in VLSI Physical Design Engineer	7	840	B.Tech/ M.Sc in Electrical/ Electro./communication/Instrument./Computer Sc. etc.
38	PG Diploma in Embedded Real Time Systems	8	840	B.Tech/ M.Sc in Electrical/ Electro./communication/Instrument./Computer Sc. etc.
39	PG Diploma in VLSI & Embedded Hardware Design	8	840	B.Tech/ M.Sc in Electrical/ Electro./communication/Instrument./Computer Sc. etc.
40	PG Diploma in Electronics System Design and Manufacturing	8	840	B.Tech/ M.Sc in Electrical/ Electro./communication/Instrument./Computer Sc. etc.
41	Cert. Course in Embedded System Design using ARM/Cortex Microcontroller	5	80	Undergoing B.Tech in Electronics/ Electronics & Communication/ Electrical

BY NIELIT CENTRES

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Celebration of International Day of Yoga

EMPOWERING PEOPLE, SERVING THE NATION

FOR FEEDBACK AND SUBSCRIPTION WRITE TO US :

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Ministry of Electronics and Information Technology (MeitY)
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NIELIT Bhawan (Head Quarter)
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- *Suggestions for improving this newsletter are most welcome*

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