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Center of Excellence-IoT & AI

A MeitY Initiative with Govt. of Karnataka, Haryana, Gujarat & AP

REPORT FOR GURUGRAM

OCT - DEC'19

Ministry of Electronics & Information Technology
Government of India

GOVT. OF HARYANA

hartron

Neural Architecture Search for Computer Vision with IBM held

19th October 2019: Computer Vision tasks include acquiring the data, process, analyse and understand the digital images. The application of computer vision has a huge list including some of the below like, Facial Recognition, Handwriting recognition, Cancer detection, Reverse Image Search & Autonomous /Self-driving vehicles / ADAS. One crucial aspect for this progress is novel neural architectures, mostly been developed by human experts, which requires a tremendous amount of human effort.

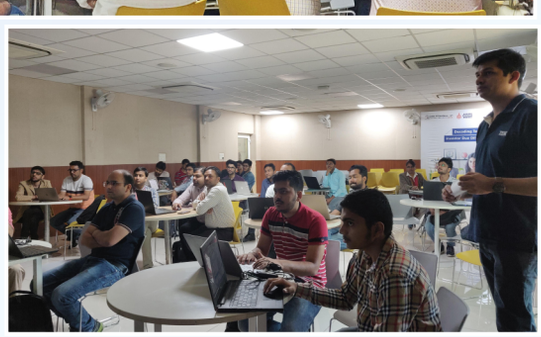
For instance, for the task of classifying images with a deep learning model, a practitioner might need to check off a sizeable to-do list including figuring out a data augmentation policy, finding a suitable architecture for the model, finding the hyperparameter settings for the taining algorithm & addressing auxiliary practical objectives like model compression for deployment.

Automated Deep Learning is concerned with automating this process by finding suitable pre-processing techniques and architecture designs along with training routines and configurations required to obtain a well-performing deep learning model. In this session, the attendees understand the basics of Neural Architecture, its automation approach and the consumption of the same through reverse Image Search.

NASSCOM CoE - IoT & AI & IBM organised a session on Neural Architecture Search for Computer Visionheld at the Center.

There were over 70 attendees, focussed on streamlining model training & deployment to classify images and detect objects as well as efficient Data set management and auto labeling.

Attendees included advanced developers from Enterprises like Accenture, Nagarro, HCL, TCS, Sapient, Ernst & Young, KPMG, Genpact, ThoughtWorks, Globallogic, Petro IT Solution, Colt, Perch Group, Telus, Xavient Digital, Seneto Network Systems, Techligent Systems and Startups like Nebularc, KBN Knockiot, Attentive AI, DronaMaps, Algofocus, Parkzap Labs, Vision Networkz, Cvision.ai, SpectralTech.ai, Spectross Digital Systems as well as students from University of Delhi, Indian Institute of Information Technology, KIIT College of Engg, PDM University, SRM University, Jaypee Institute of Information Technology, ABES Engineering College, Amity University and Galgotias University.



'TechInHealth Day' showcased innovative solutions in healthcare sector

7th December 2019: The objective of the event was to showcase the innovative solutions in healthcare domain to the relevant players and enable them to explore the various solutions to promote the adoption of digital technology in the healthcare sector.

Speaking during the occasion, Ankur Gupta, IAS, Principal Secretary, Department of Information Technology Electronics & Communication, (DITECH), Government of Haryana, informed that tech innovations in healthcare is the need of the hour and such innovations shouldn't be restricted to urban setup and must reach to rural areas of the country.

Sudhanshu Mittal, Head & Director -Technical Solutions, NASSCOM Centre of Excellence IoT & AI, Gurugram, said, "The healthcare challenges in India are huge and digital technology has a large role to play in addressing those challenges. While Center of Excellence – IoT & AI is committed to bringing innovative solutions to its platform, the user community also needs to rise to the challenge by opening up to the digital technology adoption and by providing inputs to the developer community so that we can have indigenous solutions to our problems."

Some of the Innovative solutions that were showcased include:

- **Radical Health**: Retinal scan-based detection of diseases that are local to the eye as well as systemic
- **Gesture Research**: Augmented Reality based Gesture recognition solution for Neurosurgeons
- **Incredible Devices**: Catheter reprocessing system to bring down the cost of cardiac interventions
- **Medprime Technologies**: India's first smartphone integrated portable microscope
- **Agva Healthcare**: World's cheapest Portable ventilator with Volume Pressure and Flow modes
- **Sattva Medtech**: Remote fetal health monitoring device for prenatal care
- **Healthcubed**: Point of care diagnostic device for Anaemia, Dengue, Typhoid, Malaria etc

Suneel Wattal, Joint Chief Information Technology Officer, Hartron Multi Skill Development Center, expressed his views on the same by saying, "Healthcare segment in India is highly underserved and needs innovative solutions to meet the growing demand. NASSCOM CoE, Gurugram has been focusing on bringing out the diverse and innovative solutions in healthcare segment, promoting startups who have done wonders in this segment."

Tech4SME held at CoE Gurugram

20th December 2019: Manufacturing Manufacturing SMEs have been looking forward to reaping the benefits of leveraging emerging technologies such as AI, IoT, 3D printing, AR/VR & Blockchain. With the support of MSME- DI, Karnal, Govt of India, NASSCOM Center of Excellence – IoT & AI, Gurugram & India Entrepreneurs Club co-organized Tech4SME on Friday, 20th December 2019. Tech4SME focussed on how manufacturing SMEs can leverage the Emerging technologies on various fronts including:

- Customer engagement
- Increasing productivity
- Reducing machinery downtime, Predictive maintenance & improving efficiency
- Energy savings
- Industrial safety
- Enhancing product quality
- Conforming to compliances

There was an interactive panel discussion on Challenges faced by manufacturing SMEs in Technology Adoption and Success Stories by manufacturing SMEs that have already adopted these Technology led solutions. It was followed by Product pitches by NASSCOM CoE curated solution providers.

Some of the eminent speakers included:

- **Sunil Kumar**
  Assistant Director, MSME- DI, Karnal
- **Sudhanshu Mittal**
  Head - NASSCOM CoE Gurugram &
  Director - Technical Solutions
- **Vivek Saha**
  Director & Head
  Digital Transformation & Industry 4.0
- **I.S Yadav**
  Joint Director, District Industries Center
  Gurugram
- **Deepak Ballani**
  Director General, All India Plastics
  Manufacturers' Association (AIPMA)
- **Deepak Jain**
  Director General
  Federation of Indian Industry (FII)
- **S N Zindal**
  Ex-Director General STPI, Ex-CMD ET&T
- **Ashok Kohli**
  President, Chamber of Industries of
  Udyog Vihar (CoIN)
- **Rajesh Deswal**
  President, Association of Indian Laboratories

Garv Toilets is addressing Public Sanitation through their IoT based Smart Toilets

Access to sanitation and safe drinking water was recognised as a basic human right by the United Nations in 2010. Almost a decade later, 730 million people in India lack access to a clean toilet. More than 60,000 children die of diarrhoea each year. Although the government's Swacch Bharat Abhiyan has ensured the availability of basic sanitation facilities in rural areas and metros, maintenance of public toilets still remains a major challenge.

Faridabad based, Garv Toilets led by Mayank Midha and his wife Megha Bhatnagar Midha, virtual incubatee at NASSCOM CoE - IoT, have developed a complete Public Sanitation solution to this problem in the form of IoT based Smart Toilets. These smart toilets have the below given benefits:

- **Vandalism Proof**: These portable toilet units are made up of stainless steel and each & every equipment is welded or fitted with hidden nuts and bolts making it secured against any rugged use and vandalism proof

- **Self-sustainable**: They are self-sustainable in terms of energy requirement (Solar Panels & battery packs), water requirement (overhead water tanks & borewells), waste decomposition (biodigester tanks) and maintenance (sensor based auto flush, floor cleaning technology)

- **Real-time monitoring**: RFID and IoT based sensors provide real-time updates on toilets usage and any malfunctioning. These updates are sent to a dashboard, which can be constantly monitored from a remote location.

- **User friendly**: These toilets ensure sufficient ventilation through exhaust fans and have sanitary pad incinerators as well apart from ramp access & handrails for the physically challenged

In 2017, Garv Toilets bagged a CSR project in Patna funded by Coca Cola and went on to install 100 units as part of multiple CSR activities. By now, they have installed over 800 smart toilets, reaching out to over 140,000 daily users. They have also won an order from the Uttar Pradesh government to install smart toilets as part of the Swacch Bharat Mission.

Garv Toilets has been awarded a project with the Delhi Metro Rail Corporation, where they will install Smart Sanitation Center at the Kashmere Gate Metro station in New Delhi, that will later be integrated with metro cards, enabling users to access these toilets. The project cost is around Rs 57 lakhs.
NASSCOM CoE under its Tech4Impact initiative is facilitating the access to Technology & Funding for the development & deployment of this world-class sanitation infrastructure.

DronaMaps does volumetric assessments for Bakhrija Stone Mine, Narnaul, Mahendragarh for Department of Mines & Geology, Government of Haryana

Traditionally, volumetric analysis required workers to collect data manually by climbing on stockpiles with heavy and expensive equipment, which can be very risky. The workers have to make a tradeoff between collecting quality data and their own & equipment safety

The potential of drones for the mining industry is to improve efficiency and cost. DronaMaps incubated at NASSCOM CoE Gurugram, did the survey for Bakhrija Stone Mine, Tehsil Narnaul, District. Mahendragarh for Department of Mines & Geology, Government of Haryana.

Process:
Using a quadcopter and 2 DGPS the survey was conducted in two phases. After the end of the survey, the captured data was brought to DronaMaps Lab for processing and desired imagery (3D, 2D and DSM) was generated. The change detection was done by mapping the same area at an interval of 30 days.

Impact:
The stockpiles are spread over a large area and are of varying sizes & heights so surveying them with a UAV has numerous benefits:

- **Granularity:** Since the drone driven imagery has better spatial resolution than the satellite driven imagery the user can identify the different features present in the area of interest like trucks, excavators, cranes, benches, weighing stations, checkpoints etc.
- **Time saving:** Getting ground measurements, segregating the data and making the CAD models takes minimum 30-35 weeks for the current area of interest. However, it took 3 days for ground deployment, 7 days for data processing and 13 days for geospatial analysis & application development, thereby completing the same work in 20 days.
- **Ease for Authority:** The analysed data can be easily accessed in PDF format, Web Application and Dashboard. The Web application has features such as overlaying all the vector & raster layers, performing measurements, Swiping between two layers, zooming in and out, searching & exporting the data.

The dashboard presents key data that needs to be monitored for the area of interest. Two crucial characteristics of the dashboard are it's visualisation capabilities and the way all the datapoints, however disparate, are integrated onto a single screen. The dashboard has features such as indicators that represent volume, Pie Charts that represents the relation between volume and its corresponding area, line graph that represents elevation profile etc.

- **Revenue**: The volume estimated using GIS and the volume excavated (at actual mine) were cross verified by the authority. This technique not only helps Mines and Geology Department, Government of Haryana to increase its revenue but also in monitoring if any mining contractors are violating the mining boundary sanctioned to them.

Various Delegation Visits to COE Gurugram

Mrs Jyoti Arora, Additional Secretary & Finance Advisor, MeitY visited CoE Gurugram on 10th Oct'19

Shri Abhay Kumar and Shri Saurabh Kumar,
PS to Union Minister Shri Ravi Shankar Prasad visited on 24th Oct'19

Delegation from Denmark paid a visit to CoE on 5th Nov'19

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FOR FURTHER INFORMATION CONTACT :

Email: co-innovate@nasscom.in | Website: www.coe-iot.com