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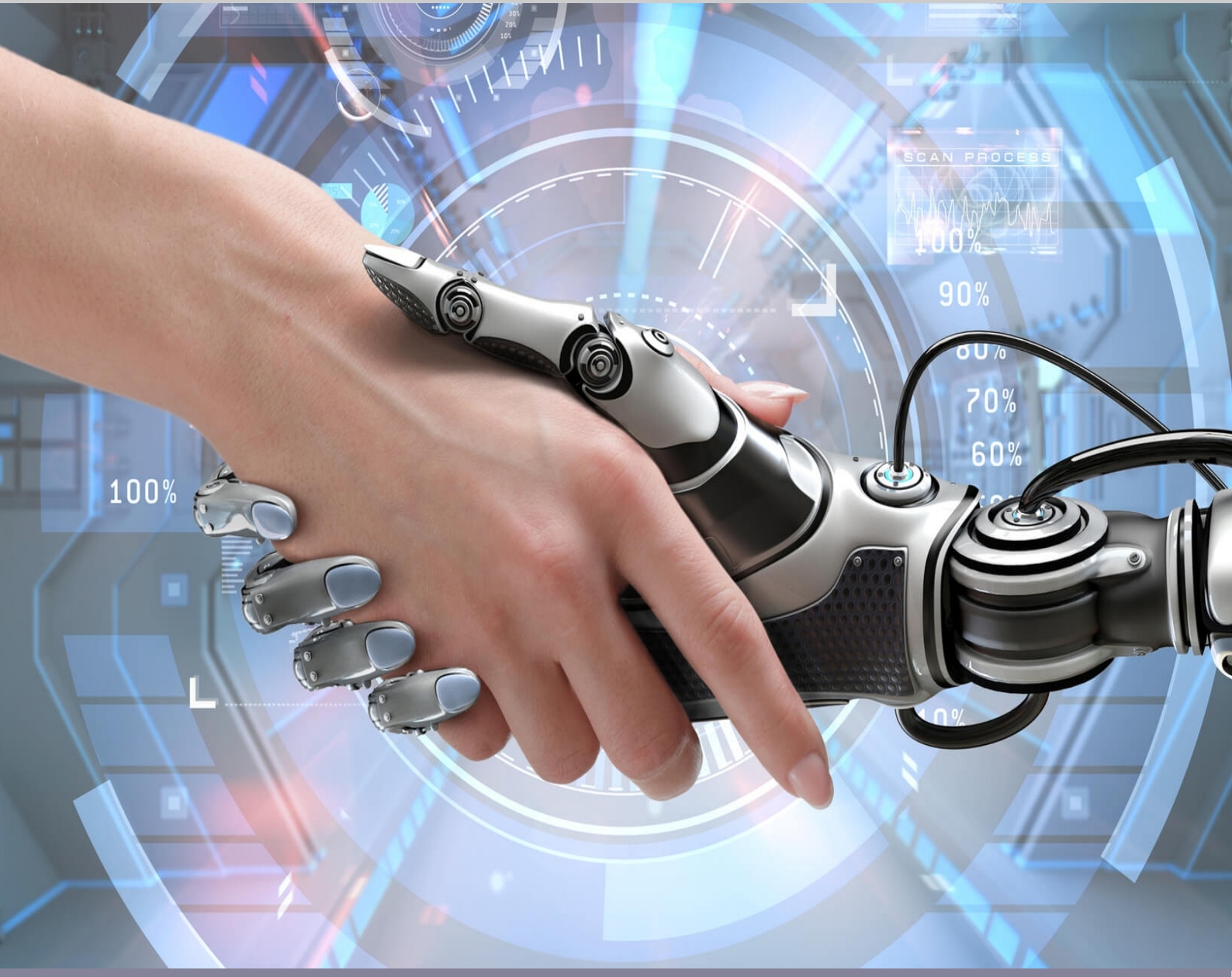
Center of Excellence-IoT & AI

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



REPORT FOR

OCTOBER – DECEMBER 2018

Center of Excellence - IoT, Gurugram

Ministry of Electronics
& Information Technology
Government of India

GOVT. OF HARYANA

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Inauguration of CoE Gurugram

With the objective of leveraging the strength of Indian IT and to accelerate innovation in the emerging technology involving Sensors, Cloud, Analytics and AI which together lead to building of solutions for enabling "Intelligence of Things", MeitY, State Governments and NASSCOM took the initiative to launch Center of Excellence – IoT & AI. Following the success of the first such center in Bengaluru, NASSCOM launched its next center in Gurugram, that is supported by HARTRON, Govt of Haryana.

The center will be the largest hub of innovation in the Northern Region focusing on emerging technologies in the field of Smart Manufacturing, Automotive, Healthcare, Agriculture etc.

The center was inaugurated by Mr. Vipul Goel, Haryana Skill Development and Industrial Training Minister, on 5th October 2018.

Main Objectives:

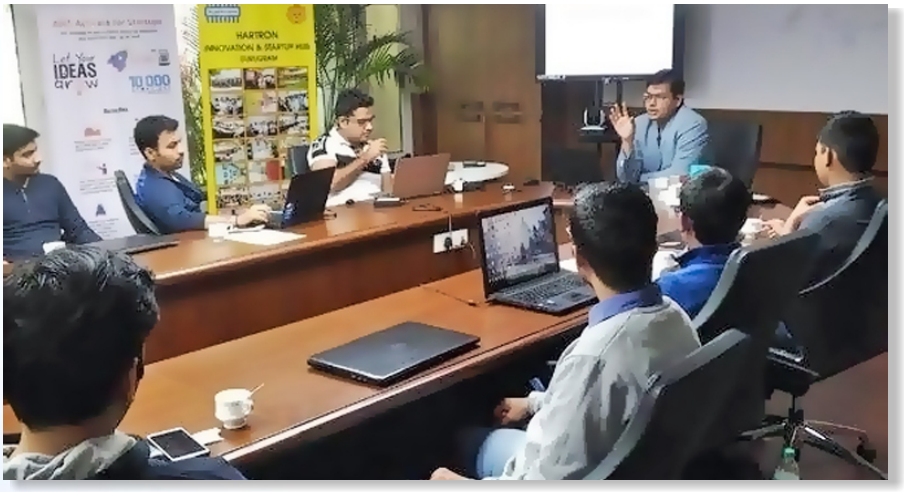
- To create innovative applications and domain capability across vertical for country's needs such as Smart City, Smart Health, Smart Manufacturing, Smart Agriculture, and others
- To build industry capable talent, start-up community, and entrepreneurial ecosystem for IoT.
- To provide an ecosystem for innovation to thrive and embrace entrepreneurship
- To energise research mind-set and reduce cost in Research and Development by providing neutral and interoperable, multi technology stack laboratory facilities
- To reduce import dependency on IoT components and promote indigenization
- To position India as a provider of end-to-end solution in engineering space
- To provide environment for product creation, testing and validation

Incubated start-ups till December 2018

Sr No	Name	Brief Description
1	Aether Biomedical	1- Bionic prosthetics for upper limb amputees. 2- Myoelectric sensors pick up nerve signal which are translated to hand movements at various DoF.
2	DronaMaps	1- Drone based multispectral imaging for 3D mapping & crop health prediction. 2- Piloting with Municipal Corporations for 3d mapping & Reliance fro precision agriculture
3	Curie Labs	1- CURIE helps big commercial facilities reduce their power consumption by 25% leveraging the power of sensors and artificial intelligence. 2- A central server named 3CTS receives data from all these sensors and analyze.
4	Airveda	1- Air quality monitoring & reporting.
5	Gesture Research	1- Surgeons can get a real 3D view of the CT scan & MRI can be overlaid exactly on the patient's head through a HoloLens. 2- A Virtual probe can be used to measure the distance and angle of the incision to be made. Working with AIIMS
6	Parkzap	1- Park & Toll management solution. Edge based in-house device consisting of visual & ultrasonic ALPR & vehicle detection with in-house image detection. 2- Piloting with NHAI
7	CoDE (Inaaya)	1- Humanoid Robot
8	Agsmartic	1- "Croplytics" is a smartphone-based identification of crop disease & pests and giving out recommendations specific to the farm's geographic location

Build your own voice bot

17th November, 2018: A Live coding workshop was organised where the attendees built their own voice bot. In this comprehensive live session, it was discussed on Natural language processing and basics on Voice Skill Development encompassing all the required skills for a Voice Skill Developer. This session covered all basic features of Alexa Skills Kit (ASK) with real-world example skills (including a published skill). There were about 20 participants for the interactive session with diverse backgrounds in terms of profession, age & gender.



Decoding Investor Due Diligence & deciphering Termsheets

28th November 2018: NASSCOM CoE, Gurugram in partnership with Kotak Mahindra Bank & ANM Global organised an interactive session on Decoding Investor Due Diligence & deciphering Termsheets. Nidhish Mehrotra, Managing Partner, ANM Global and Indermohan Singh Uberoi, Vice President, Global Transaction Services, Kotak Mahindra Bank were the speakers for the session. There were over 120 attendees, consisting mostly of advanced Startups which are looking to raise funds or undergoing Investor due diligence.

Conference on Disha Act

8th December 2018: CoE, Gurugram in collaboration with Innovation Curis organised a Conference to discuss the challenges and opportunities with the proposed DISHA (Digital Information Security in Healthcare Act) Act. There were Panel Discussions with delegates from Max Healthcare, Apollo Hospital, Lal Pathlabs, Medicon Healthcare etc on the proposed DISHA act with developments on Data protection laws and possible implementations and opportunities for making health sector DISHA and data protection ready.

Startup Showcase

13th December 2018: Startups incubated at CoE Gurugram got an opportunity to showcase their product to Mr Rishad Premji, Chairman, NASSCOM and Chief Strategy Officer & Member of the Board, Wipro Technologies and Ms Debjani Ghosh, President, NASSCOM.

Roundtable & Devsprints on Security Around Blockchain

15th December 2018: CoE Gurugram in partnership with Blockchain Developer Community, Zcash India & Hyperledger Delhi organised a Roundtable & DevSprints on Security in Blockchain. The efficacy of Secure vs Anonymous transactions in the secure wallets was discussed. Zero Knowledge (ZK Snarks/Starks) Proof technology to solve the issue of confidential data on the public ledger, where the transaction can be encrypted while still remaining valid as it is added to the blockchain, was introduced followed by an Interactive Q&A session. There were a few upstream contributions during the DevSprints as well.

Hands-on with Alexa Skills Dev & Voice Design

22nd December 2018: CoE Gurugram in partnership with Alexa Developer Community organised a Hands-on session on Alexa Skills Dev & Voice Design. An Alexa skill for a Crypto Tracker was built from scratch by the attendees during the DevSprint on AWS Lambda in Node.js.

A case study in scalability and accessibility of drone-based mapping

December last year, the DGCAs policy on Remote Piloted Aircraft came into effect which helped to regulate the usage of drones in wide-ranging applications. All drone operations, now, have to be approved by the Digital Sky Platform, which is an unmanned traffic management (UTM) system to facilitate registration and licensing of drones and operators in addition to giving instant online clearances to operators for every flight under the NPNT (No Permission No Takeoff) system. However, months after the policy coming into effect, there are very few NPNT enabled UAS. Drone policy 1.0 also disallows Payload detachment & BVLOS operations. Considering this and other intricacies, a more evolved version of this framework, the Drone Policy 2.0 is already being drafted and is up for discussion.

These, however, are not the only challenges facing a UAS based company. There are issues to be dealt with each project. DronaMaps produces GIS enabled 3D models at centimetre level accuracy using its deep learning algorithms on the aerial imagery data collated through drone based surveys.

DronaMaps faces two primary challenges, one being the operational project management and the other associated technical complications. In this post, the entire journey is detailed, just in case, someone, somewhere in the world is considering using DJI drones for surveying, urban planning, or other development focussed applications.

DronaMaps created the plan with an assumption of using 8–9 quadcopters for their operations. The initial challenge was to decide the area and define the distance the drone would go from the launch location. The other challenge was to make the detailed flight plans ensuring that no team should be flying adjacent to each other. All other factors covered during the flight planning hold true. The total area covered and of interest was 61 Sq Km. The terrain assumed to be fairly flat except at a few locations. As the elevation was not a major factor in the defined patch distribution, it was assumed DronaMaps dealt only with the constraints borne from swathe area and line of sight restrictions.

Majority of the flight plans were created considering the line of sight constraints and the rest with the area distribution. Thus, two types of execution plans were developed. The first half was column wise and second half was grid-wise.

A column-wise plan started from the northern side and extended to the south with an average width of 180m and the length changed according to the boundary limits. On the other hand, a grid-wise plan was made based on the area covered in each flight keeping in mind battery and time optimisations. On-ground flight throughput for a Phantom 4 drone was around 0.8 sq km and the maximum distance from the launch location was 500m. The most important thing was to understand that the processing boundaries and flight boundaries are different. Flight plans are created considering only the feasibility of flight, whereas, processing boundaries are decided based on the processing capability and total file size.

DRONAMAPS

A total of 20 locations were identified for the GCPs. Since the area of interest is almost flat, the criteria undertaken was simple - they should cover all the extremities in the plan and some should be in the middle. It is extremely critical to note that the locations should be accessible to people on the ground. High-resolution 3D maps are hosted online. Information on each asset is also embedded in the 3D model. The details of the plots include their unique identification number, area, the purpose of the building is being used for, and the category of the industry it belongs to.

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