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Center of Excellence-IoT & AI

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



REPORT FOR GURUGRAM JULY-SEPT'19



Ministry of Electronics
& Information Technology
Government of India



Investor Hours with Lead Angels & Investopad

22nd July 2019 : NASSCOM Center of Excellence - IoT & AI invited the Investment teams of Lead Angels & Investopad at Gurugram center for an exclusive opportunity to interact in a 1:1 pitching session with startups innovating in HealthTech, AgriTech, Smart Cities, Fintech & Industry 4.0.

Lead Angels is India's first full-service Angel Network for startup investment with five chapters, 25+ investments and 130+ members. It was originally founded by a team of three IITB alumni, with the primary objective of promoting alternative investments in startups which are disruptive and have the ability to rapidly reach dominant market positions and thus become valuable investments. These startups apart from being investment worthy also make a huge social impact in a country with multiple under-served & under-valued markets.

Investopad focuses on ventures that are centred on solving India-centric problems and tapping on cross-border opportunities. The investment team builds relationships with these enterprises from ideation stage to observe the evolving mindset, thinking process and capabilities of entrepreneurs. Being an open platform, Investopad has already partnered with NASSCOM's 10,000 Startups initiative, and have given hand-picked

VCs and angel investors free access to their campus in Gurgaon.

- **Ishan Jindal, Head Investments**, North & East, Lead Angels: Ishan heads Investments at Lead Angels. With a vast experience and a demonstrated history of working in IoT, Consumer Tech Mobile App industry. He's has worked with Da Vinci Derivatives and Blume Ventures.

- **Sera Arora, General Manager**, North & East, Investopad : Sera leads deal-flow for North & Eastern region for Investopad. Prior to this, she was with Lead Angels, leading the North chapter. She focuses on sourced investment opportunities for network base of 150 investors, has conducted an analysis of 1000+ startups and spearheaded end-to-end fund-raising syndicate transactions to the tune of \$500k in 3 early stage companies

- **Akul Garg, Analyst**, Investopad

Pitching Session: 11 Startups that include DronaMaps, Liradolf, Avrio, Donkeyworks, Kashware, Civil Cops, Deepsights AI Labs, Invoid, AIEye, Galaxy Card & Capital Quant pitched to the Investment panel, of which 4 teams have been shortlisted by Investopad & 2 teams by Lead Angels for the next round.



Prosperity through Patents : Making strategic use of IP/patents for startups and emerging businesses

29th July 2019 : Recently a Gurugram based logistics startup became the first Indian company to be patented by the US for differentiated technology that makes the logistics industry more competent. It's needless to explain the importance of patents to a company that has developed an emerging technology enabled proprietary product. However, the companies that do understand its importance, most often do not have the resources and the know-how to go through the entire patenting process.

To demystify the procedure for a filing a patent in India or abroad and to highlight the associated government supported fiscal benefits, NASSCOM Center of Excellence in cooperation with the European Business and Technology Centre (EBTC) invited senior delegates from the European Patent Office (EPO), the Ministry of Electronics and IT(MeitY) and National Research & Development Co-operation (NRDC), for a seminar on "Prosperity through Patents: making strategic use of IP/patents for startups and emerging businesses" on 29th July 2019.

THE EMINENT PANEL OF SPEAKERS PRESENT INCLUDED:

- Poul V. Jensen, Director, EBTC
- Sudhanshu Mittal, Director, NASSCOM
- V. K. Jain, Senior Manager, NRDC
- Anal Kumar Roy, MeitY
- Sumantra Mukherjee, Director, KPMG
- Srihari S K, Partner, K&S Partners

Poul V. Jensen Director, EBTC delivered the Inaugural Address, followed by interesting insights offered by VK Jain, Senior Manager, NRDC on Fundamentals of Licensing, Anal Kumar Roy, MeitY, on government schemes for facilitation of IP filing by startups in India & abroad, Sumantra Mukherjee, Director, KPMG on IP management strategy for startups, while Srihari S K, K&S Partners delivered a technical session on filing patents through PCT mechanism and importance of PriorArtSearch.



HOW TO BUILD & INTEGRATE A TRUSTED ML MODEL: Artificial Intelligence, Data Refinery and Data Governance

24th August 2019: NASSCOM CoE – IoT & AI and IBM organised a Technical workshop on HOW TO BUILD & INTEGRATE A TRUSTED ML MODEL: Artificial Intelligence, Data Refinery and Data Governance using IBM Watson Studio and open source components like OpenShift & Kubernetes.

Hands-on for ML model development focused on:

- Product recommendation engine based on Retail customer dataset
- Loan eligibility model based on Financial profile dataset

Speaker: Rajesh K Jeyapaul is a Cloud Solution Architect in the IBM Ecosystem & Developer team. He is focused on enabling partners and developers on IBM cloud solution especially on Bluemix, IoT, Mobility and Big Data. He has been with IBM for 16+ years and has an industry experience of around 19 years.

At IBM, he has worked on various technologies involving: Java virtual machine, Operating System, Server virtualization, Cloud Management etc. He is an IBM Plateau holder with 4 patents and 3 publication. He has co-authored various technical books and is an IBM RedBooks author.

Agenda included:

An open ‘Information Architecture’ of AI:

In this exploratory session, the architecture of AI from multi-cloud standpoint was understood. The Role of open source components like OpenShift, Kubernetes and cloud-native architecture like micro-services and multi-cloud provisioning.

Build a Trusted Foundation to drive better Insights:

Data governance introduces practises that optimise the value of data, clarifies the ownership of the data and enables businesses to make better decisions based on the data. A unified governance strategy helps bring order to structured and unstructured data by delivering governed information to the business. In this session, Participants got an understanding of the core data Governance model and the need for effective data pre-processing.

Hands on - Understand Data Governance & Refinery using IBM cloud:

In this lab, participants used the financial dataset and understand the Data Governance and Refinery approach. Objective was to make the participant understand that good data governance and Refinery is key for the Model building.

Hands on – ML model development using IBM cloud:

In this Lab, participants were given an introduction to the ML role in building a recommendation engine system. Using a Retail dataset, participants understood building the recommendation system. The objective of this lab was to introduce the ML model build environment so that post data governance and refinery, how to step into model building.



6th India China Strategic Economic Dialogue (SED)

A Working Group meeting on High Tech under 6th India China Strategic Economic Dialogue (SED) was held on September 07, 2019 (Saturday) at 10 AM at MeitY (Ministry of Electronics & IT) under the co-chairmanship of Joint Secretary (ICD), Shri Rajiv Kumar Ministry of Electronics and Information Technology, Electronics Niketan, 6, CGO Complex, Lodhi Road, New Delhi.

The Chinese delegation's visit to CoE-IoT & AI, Gurugram was planned which involved a tour of CoE-IoT & AI Lab, Startup showcase with a demo of their products/services offered and a presentation on CoE containing the following:

- Discussion with management pertaining to start-ups
- Brief on their selection process, opportunities and exposure provided etc.
- The key deliverables of the CoEs, technology focus areas
- Current achievements etc.

Some of the key delegates included:

- Wu Hao, Director General, Department of Innovation and High-Tech Development, National Development and Reform Commission
- Zhang Zhihua, Division Director, Department of Innovation and High-Tech Development, National Development and Reform Commission
- Zhang Liming, Center for Innovation-Driven Development, National Development and Reform Commission
- Lin Xiaodong, Public Affairs Department/ VP, ZTE Corporation
- Hu Shu, Associate director, Xiaomi Corporation
- Jin Yidun, Deputy Secretary-General, Telecommunication Development Industry Alliance
- Song Yujun, VP – Global, Appliances, Haier Group
- Jiang Youdong, Director, Shenzhen China Star Optoelectronics Technology Co., Ltd
- Yuan Nan, Vice President / CEO, Wuhan FiberHome International Technologies Co., Ltd. / FiberHome India Private Limited



HANDS-ON SESSION ON BREAST CANCER DETECTION

28th September 2019: In recent times, breast cancer has become the most common type of cancer affecting women worldwide accounting for 25% of all cancer cases and affected 3.5 million people in 2017-18. Early diagnosis in these cases significantly increases the chances of survival. The key challenge in cancer detection is how to classify tumours into malignant or benign. Research indicates that most experienced physicians can diagnose cancer with 79% accuracy while using artificial intelligence based diagnosis, it is possible to achieve 91% accuracy.

NASSCOM CoE-IoT & AI & Eqounix Tech Lab organised a hands-on session on 28th September 2019, 10am onwards at the CoE Gurugram center on Breast Cancer detection. This was a paid session and there were over 50 attendees, consisting of basic & advanced developers from enterprises like Sopra Steria, United Health Group, TCS, HCL, Inventum Technologies, Publicis Sapient, Globallogic etc and startups like Attentive AI, Empass, Anasakta Labs, NEbulARC, SirionLabs, Vision Networkz etc. Students from ICGEB/JMI, Indira Gandhi Delhi Technical University etc also participated in the session.

The session first half focussed on Wisconsin Diagnostic Cancer (WDBC) & Invasive Ductal Carcinoma (IDC) datasets insights, Visualization of Dataset, feature selection and why they are chosen and how the physical parameters are translated into a dataset. In the second part, the focus was on Feature Selection and CNN, random forest based classification of cancer as malignant or benign followed by the optimised the deployment strategy & cost estimation

WISCONSIN DIAGNOSTIC BREAST CANCER (WDBC):

The samples consist of visually assessed nuclear features of Fine Needle Aspirates (FNAs) taken from patients. Attributes 3 to 11 were used to form a 9-dimensional vector which was used to obtain a neural network to discriminate between benign and malignant samples. Cross-validation was used to project the accuracy of the diagnostic algorithm.

Field	Attribute	Field	Attribute
1	Sample code number	7	Single Epithelial Cell Size
2	Class: 2 for benign, 4 for malignant	8	Bare Nuclei
3	Clump Thickness	9	Bland Chromatin
4	Uniformity of Cell Size	10	Normal Nucleoli
5	Uniformity of Cell Shape	11	Mitoses
6	Marginal Adhesion		



INVASIVE DUCTAL CARCINOMA (IDC)

Invasive Ductal Carcinoma dataset originally consisted of 162 slide images, scanned at 40x. From that, 277,524 patches of 50×50 pixels (which is converted to 32 x 32pixels to fit the model architecture) were extracted, including, 198,738 IDC negative examples & 78,786 IDC positive examples. Each image in the dataset is labelled based on the following parameters:

- | | |
|-----------------------------------|---|
| • Patient ID: 10253_idx5 | • x-coordinate of the crop: 1,351 |
| • y-coordinate of the crop: 1,101 | • Class label: 0 (0 indicates no IDC while 1 indicates IDC) |

CNN ARCHITECTURE USED :

- Used exclusively 3×3 CONV filters, similar to VGGNet
- Stacked multiple 3×3 CONV filters on top of each other prior to performing max-pooling (again, similar to VGGNet)
- But unlike VGGNet, used depthwise separable convolution rather than standard convolution layers
- Keras Sequential API is used to build Cancer Net

The model achieved 86% classification accuracy, 85% sensitivity, and 85% specificity.



Retail AI startup Vedalabs raises preSeries A funding from Satin Neo Dimensions



The Team at AI startup Vedalabs

Vedalabs, an AI startup that helps retail stores, has raised an undisclosed amount as a part of its preSeries A round from end-to-end retail store solutions provider Satin Neo Dimension, to expand its reach in retail analytics.

With this development, serial investor and Founder of Satin Neo Dimensions Satvinder Singh will join the startup's board. CoE Gurugram incubated Vedalabs plans to use the funds raised to expand its product capabilities into intelligent store fitouts as well as scale the current products to store level analytics.

Last November, the startup had scaled its presence in the US with an investment from Alchemist Accelerator as well.

Founded in January 2018, by Veer Mishra, Vivek Singh, Saurabh Shandilya and Saurabh Yadav, Vedalabs is an AI platform that helps retailers move more inventory and make informed decisions by real time store level insights.

With deep expertise in AI, computer vision, as well as retail technology space, Vedalabs makes it possible for retailers to understand footfall, as well as gives an overview of demographics, repeat count, and more

deep insights so as to make more informed decisions at a lower cost but with higher accuracy. This, in turn, allows enterprise, retailer, and warehouses to plan more accurate offers and improve in-store experience by providing personalised experiences to every end consumer.

There are two ways the startup fits its platform-on-site as well as through an on-cloud model, both of which have a monthly retainer that depends on the usage. The average ticket starts from Rs 5,000 per month per store and goes up to Rs 25,000 per month per store, claims Veer.

"NASSCOM CoE has helped us in scaling the product, we have been constantly in touch with Shantanu, Sudhanshu for appropriate industrial connects and guidance on how to scale the tech stack. NASSCOM has given us an opportunity to exhibit in Cia Tech Japan in month of October 2019."

- Vivek, Veda Labs

By the end of this calendar year, the startup is looking to deploy its solutions across 300 locations.

NaraloT wins \$10,000 in ADB (Asian Development Bank) AIM Hackathon for 'Future proofing Global Water Crisis' category

NaraloT, CoE Gurugram incubated startup, became the only Indian company to have won US\$10,000 in ADB (Asian Development Bank) AIM Hackathon for 'Future proofing Global Water Crisis' category. The hackathon was organized at the ADB Headquarters, Manila, Philippines from 31st Aug to 2nd Sep 2019.

A total of 220 teams from 39 countries, participated to create a solution for the Global Water Crisis.

Agua, powered by NaraloT, is an integrated real-time water management solution that works to increase the availability of water through optimization of water usage, consumption and flood management. The product has been under development for four years and through ADB it has created a global visibility for its solutions.

The Asian Development Bank (ADB) will partner with three winning teams from the hackathon hosted by ADB in partnership with the Asian Institute of Management (AIM).

ADB and AIM held the competition as part of Digital Week 2019 taking place from 2 to 5 September. More than 700 youth and startups from around the world presented innovative solutions to three challenges. ADB and AIM defined the three challenges based on current organizational and development needs.

The winning teams are 'Eskwelabs' from the Philippines and 'Gnowbe' from Singapore for the 'Building the Digital Skills of Employees' category; 'FlexM' from Singapore for the 'Developing Digital Payment Solutions' category; and



'Agua Wireless Systems' from India for the 'Future Proofing for the Water Crisis' category. The solutions leverage emerging technologies such as the internet of things, artificial intelligence, and digital payments.

ADB has also entered into non-exclusive cooperation arrangements with Microsoft Operations Pte Ltd. and Oracle Corporation Singapore Pte Ltd. to collaborate on the adoption and use of emerging technologies in ADB's work. Under the cooperation arrangements, ADB and the companies will exchange information on emerging technologies, train people to apply these technologies, and organize joint events and meetings. Both companies will also provide advisory and knowledge support for ADB's digital transformation.

'ADB recognizes that partnerships with top IT companies as well as small startups will help support our digital innovation program through knowledge exchange, capacity building, and co-creation of digital solutions designed for ADB's business needs,' said ADB Vice-President for Administration and Corporate Management Ms. Deborah Stokes.

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. In 2018, it made commitments of new loans and grants amounting to \$21.6 billion. Established in 1966, it is owned by 68 members-49 from the region.



Airveda shortlisted by GMDA to setup air quality monitors in Gurugram

Universal access to air quality data leads to greater awareness and better decisions around air quality exposure. Unfortunately, today this data is available only for 71/4000 Indian cities. At Rs 1Cr/monitor, most states cannot afford them. There is a need for highly affordable and accurate air quality monitors that can solve this problem.

CoE Gurugram incubated, Airveda Technologies, has been shortlisted by Gurugram Metropolitan Development Authority (GMDA), in addition to, two other companies for deploying air quality monitors in Gurugram including sectors 38, 39, 46 and 47 (Bakhtawar Chowk), Acme Chowk (Wazirabad Village Mor) TDL Bio-Diversity Park & Medicity etc.

New monitors are being installed as part of the pilot project, and the authority might increase the number of monitors eventually for a better analysis of air quality across the city. These air monitors will display the levels of PM 10 and PM 2.5 in ambient air.

The expenses of installation will be borne by the agencies as part of their CSR initiatives. The private players will share the air quality data with the development authority on a real-time basis,” said a GMDA official. He also said a pact would be signed with air quality monitoring (AQM) partners in due course. Meanwhile, the three partners will start the work at the five sites allocated to them for testing the feasibility.

Airveda, co-founded by Namita Gupta, offers portable and connected air quality monitoring devices, designed and manufactured in India. The devices are connected to an app which syncs the data with a cloud server and can be visualised over customised dashboards. Airveda monitors PM2.5, PM10, CO2, Temp, Humidity & TVOC for Indoor environments and PM2.5 & PM10 for outdoor environments. Airveda monitors use a high-quality laser-based sensor which is calibrated against a BAM

(Beta attenuation monitor) to provide the most accurate results. Comparison data with BAM shows a correlation of greater than 90%.

NGOs like Greenpeace and Environics Trust have set up 100s of Airveda monitors in various cities across the country to make data available in cities where none exists. Airveda has also done a project with the Delhi Government (in partnership with Greenpeace) where they had set up a monitor with displays outside the Delhi Secretariat as well as in 5 Government hospitals around Delhi to drive awareness around air quality.



Several schools across Delhi like Pathways, Ardee School, Vasan Valley, American Embassy School, British School use their monitors to make data available to students and parents and make decisions regarding outdoor playtime to reduce exposure for students who are at most risk due to their developing lungs. Several RWAs like Park Place, Palms, Arralias use their monitors in their condominiums enabling residents to make better decisions with regards to pollution exposure.

Apart from that, Airveda has worked with the Nagarro, DLF, Denso, Airtel, TimesInternet, BCG, Bill & Melinda Gates Foundation etc.

GMDA sources said around 200 air quality monitors would be installed at the locations where CCTV cameras were set up. These monitors will be installed in phases later.

Devnagri wins the award for best Social Impact Startup

CoE Gurgram incubated startup, Devnagri has won the award for the best Social Impact startup, at Lucknow during the recently concluded UP startup conclave and received the award by the Deputy Chief Minister, Mr. Dinesh Sharma. Devnagri won the award from over 400 participants.

Devnagri does NLP based contextual translation across 22 vernacular languages. Their USP is their contextual ability rather than just a literal translation. They've worked with Central Electricity Regulatory Commission (CERC), IFFCO-Tokio, Myntra, CarDekho, Prestige and have recently bagged an order from CDAC as well.



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