

# SANTOSH VASUDEO HULAWALE (INNOVATOR)

PROPRIETOR (ROBOTECH RESEARCH)

Created A.I humanoids: **INDRO (2016), INDRO 2.0 (2017), INDRO 3.0 (2018)**

& designed **44 identical innovations** in **18 years** of R&D.

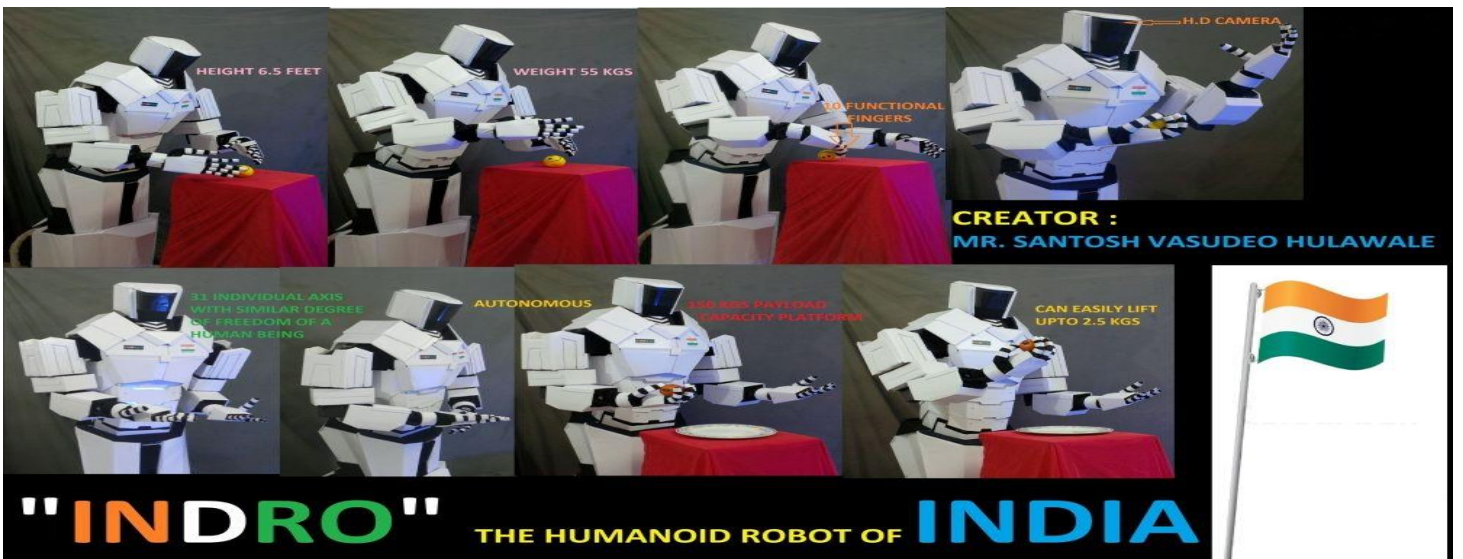
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Address: Mumbai 400065, India, VIDEO LINK: <https://www.youtube.com/watch?v=zt4hA2kaDys>

Google "indro robot" for more info



ACTUAL IMAGES OF INNOVATIONS, INDRO & INDRO 3.0



# INTRODUCTION

If you want people to believe your ideas, they have to be first manifested into reality, & **INDRO 3.0** was exactly about that.

I am a 38 years old computer network engineer, who had being doing research in robotics for more than 18 years, in my custom built laboratory.

From the list of my **44 innovations**, **INDRO (The humanoid robot)** which was developed in the year **2016**, was followed by **INDRO 2.0 (year 2017)**, and soon after that I decided to create a much more advanced autonomous A.I humanoid robot, which I named **INDRO 3.0 (year 2018)**.

Instead of talking about INDRO 3.0, I would request you to see the videos of INDRO 3.0 which will speak for it selves. VIDEO LINK: <https://www.youtube.com/watch?v=zt4hA2kaDys>

Most of these **44 identical innovations** are based on **A.I robotics** & are one of their kinds. They are designed for these **following sectors**: Defence, Security, Harnessing Electricity, Infrastructure, Conversion of combustion vehicles to Electric, Small & Large scale Industries, Education, Rescue Operations, Disaster Management, Agriculture, Water Management, Renewable Energy, Repairing Environment, For the Differently able, Garbage Management, Future Transportation, Housekeeping, Facility Automation, Healthcare, Civil work, Futuristic Interiors, Fitness Industry, Future Clothing, Tech Gadgets, Hotel Industry, Mining Industry, Excavation, Shipping Industry, Entertainment Industry, Surveillance & Aviation Industry.

**Areas of expertise:** Python programming, C, C+ Programming, Machine learning A.I, Deep Learning A.I, Open C.V, Tensor Flow, C.N.C programming, Arduino IDE, 3D animation Maya / 3D Max / AutoCAD, Wide range of Micro computers, microcontrollers, Sensors, Quantum computing, supercomputing, building small scale super computers, Humanoid Robot schematics / programming / electronics / mechanics / carpentry, aerodynamics, mathematics, Building C.N.C, 3D printers, 6 axis industrial robots, automated industrial plant, Specialised in integration of Sensors (I.R, proximity, thermal, pressure, optical, position) / potentiometers / gyro chips / digital, linear & clear path servos / steppers / A.C, D.C, Familiar with wide range of industrial tools and machinery required for building prototypes, Specialised in industrial & home automation, Building robotic prototypes in minimal time span, from bare minimum resources, Pursuing advanced neural network A.I programming.

**Key skills:** Good communication skills in English Hindi & Marathi Languages, Drawing 3D sketches and designs, Teaching & Public speaking, Developing custom made codes for autonomous humanoids & industrial robots instantly.

## **CURRENT UNDERTAKINGS**

- 1. DEVELOPING A WIDE RANGE OF SERVICE ROBOTS.**
- 2. DEVELOPING ADVANCED E-UAV, DRONES & VTOL (70 KG PAYLOAD CAPACITY).**
- 3. DEVELOPING ONE OF KIND SOFISTICATED GADGETS FOR CLIENTS WITH CUSTOM REQUIREMENTS.**
- 4. ALL KINDS OF EVENTS ADVERTISEMENTS, PRODUCT LAUNCH, TELEVISION SHOWS & EXHIBITIONS.**
- 5. COMMENCING SPECIFICALLY DESIGNED HIG-END WORKSHOPS IN SCHOOLS, COLLEGES & INSTITUTES.**
- 6. GUEST LECTURES.**

## FURTHER PLANS

With a list of 44 unique innovations already ready on paper, and many more in the process of completion, I plan to further prototype these designs and later patent them.

My companies primary goal will be to focus on the innovation aspect and will therefore only indulge in the production process of selected products, where the demand can be met with the contemporary resources possessed by my company.

For a range of products where the demand is expected to be extremely high, I would prefer to collaborate with an already established company or organization as a technical partner, than indulging my company into the process of manufacturing. The sectors for which most of these 44 innovations are designed are extremely large, and therefore only an established company or organization with a brand name, can do justice to meet the demand of these products.

All the 44 innovations are smartly & precisely designed keeping in mind the future process of converting these designs into successful working prototypes, in a minimal time frame.

Once these prototypes are developed into final products, they will meet the future demands of the sectors, mentioned below.

### LIST OF SECTORS WHERE THE 44 INNOVATIONS WILL BE FURTHER USED

Most of these 44 identical innovations are based on A.I robotics & are one of their kinds. They are designed for these following sectors: **Defence, Security, Harnessing Electricity, Infrastructure, Conversion of combustion vehicles to Electric, Small & Large scale Industries, Education, Rescue Operations, Disaster Management, Agriculture, Water Management, Renewable Energy, Repairing Environment, For the Differently able, Garbage Management, Future Transportation, Housekeeping, Facility Automation, Healthcare, Civil work, Futuristic Interiors, Fitness Industry, Future Clothing, Tech Gadgets, Hotel Industry, Mining Industry, Excavation, Shipping Industry, Entertainment Industry, Surveillance & Aviation Industry.**

Out of the above mentioned sectors, I will give brief details on **3** of the major sectors where the company will earn huge profits, once they introduce the designed products to the designated sector. Apart from profits, the company will also earn valuable credentials and respect for using futuristic technology for a good cause. I also have the business plan ready with me, and I would share it on further communication.

**1. Defence:** Looking at the huge scale of this sector, I have designed 8 (5 ground /1 aerial / 2 amphibious) completely unlike robotic prototypes particularly for this sector only. Once these prototypes are developed into finished products, they will earn enormous demand right from the day they are introduced. They are specifically designed **only for the Indian Defence sector**, and therefore for this particular sector, I will only tie up with an Indian company or organization which is already developing weapons & machinery for Indian Defence sector.

All these 8 prototypes will be fully autonomous robots, based on machine learning & deep learning A.I, and they will also have a manual override option to take control of the robot in case of custom operations or actions.

These prototypes will possess following qualities i.e.: fully autonomous, bullet / grenade proof, water / fire proof, all terrain, stealth, night vision, motion / sound sense, voice process, compatible with fitments of wide range of lethal and non lethal weapons, unlimited range of operation, zero fuel cost (fully electric), low maintenance, user friendly operation, sturdy build quality, self destruction capability, compact & light weight (can be air dropped), swift, embedded with multiple sensors, & multipurpose.

With all the above mentioned qualities these robots will be perfect war machines, which will contribute in further strengthening our defence sector. They will be a perfect upgrade to meet the modern warfare demands, which is desperately needed today to reduce the number of soldier's martyred on battle field, and ambush.

**2. Security:** For security sector I have designed 5 prototypes (3 ground /1 aerial / 1 amphibious) and each of these 5 prototypes will have 3 further variants to suit the market demand in terms of price range. These robots will be available to general public who are in need of high end security. The end users for this particular product will be, police force, railway police force, private & government security agencies, VVIP personals, banks, corporate facilities, research centres, atomic power plants, safe vaults, malls, amusement parks, shipping companies, sports complex, resorts, business parks, jewellery stores, hospitals, ware house owners & forest department. Apart from the Indian market, the company will earn huge profits on export, as these products will have even more demand in overseas market.

**3. Service Robots:** This particular innovation seems to be in a very high demand, especially in the overseas market, as I have got multiple offers from companies based in China, America, Russia & Singapore regarding technological collaboration. The fully functional successful prototype for the same is already ready with me (**INDRO 3.0**) (patent in process) and I am looking forward to produce a wide range of service robots in my company.

Companies all over the globe are looking forward to introduce A.I humanoids robots as a product in every house hold, where there will take care of a wide range of requirements & tasks given to them. The day is not far that these humanoids would actually be capable of taking care of most of the chores, but it would be too early to commit and introduce a humanoid which is actually capable of taking care of the daily chores without malfunctions or break downs. Most of the robotic companies are well aware of this fact and therefore they have introduced robots in the market, which are almost 99% application based. In case of most of the products it's just like offering a touch screen computer on wheels & audio, and in some cases they do provide 5 to 6 axis, which have bare minimum torque, and are therefore not capable of giving a satisfactory physical experience to the user. The user experience of these robots is only limited to audio and video, which these days can also be fulfilled by smart phone applications and products like Alexa and Google Home.

My latest creation **INDRO 3.0** (technical details mentioned on page no ) is more of a machine based humanoid, and is specifically created to give the end user the physical experience of a humanoid robot. When we talk about physical experience, it means there could be a wide range of physical tasks, the end user would expect from the humanoid to be accomplished. The humanoid robots which I plan to manufacture will not only give the end users the experience of applications, but also a physical experience where the robot will perform a wide range of predefined physical tasks.

There is also a plan to rent most of these humanoids in the initial stage to end users, which will eliminate the issue of providing warranty on the product (most of the spares & electronics used in the production do not come with warranty). The company will look after the maintenance and service of the robots, which will turn out to be a major factor in increase of demand for these robots by common people.

Cont.....

There are many Chinese companies who have already introduced their service robots in the global and Indian market, these robots do not come with any sort of warranty or after sales service and also over priced for Indian market. The humanoids that I have designed are much more advanced in terms of design, technology, durability & utility.

I have mentioned below the different types of humanoids for which the design is ready, and therefore they can be prototyped and introduced in the market as finished products within the time span of less than 6 months:

- 1. Humanoid robot waiters (Already in the global & Indian market, supplied by Chinese companies):**
- 2. Floor cleaning robots (Already in the global & Indian market, supplied by Chinese companies)**
- 3. Industrial grade, Garbage disposal robots (For 24/7 outdoor use)**
- 4. Reception / sales robot.**
- 5. Security robots**

# THE DREAM PROJECT FOR OUR COUNTRY

**Create a 4.5 feet biped (two legged) A.I humanoid robot for India:** After successfully developing the third version of humanoid, INDRO 3.0, I am extremely confident of developing a 4.5 feet tall, biped A.I humanoid robot, for our country. Since the launch of ASIMO, in the year 2000, I have dreamed of making a similar robot for our country. It is hard to believe, that till date there hasn't been a single institution, which has been successful in creating a life size biped humanoid robot, which we can proudly call our own. For a country like India, which has launched record breaking satellites, tested nuclear weapons, created Brahmos the supersonic cruise missile, built supersonic aircrafts & developed numerous more technological marvels, developing a biped humanoid robot, certainly doesn't seem like a difficult task.

I have toured almost every major, IIT & NIT tech fest in India, with my previous versions of humanoids, and while doing this, I had an opportunity to personally interact with hundreds of talented engineering students, who are doing some or the other research in robotics. I have sorted a list of students & researchers, who are talented enough to be a part of a team, which could give India, its first life size biped A.I humanoid robot, in a record breaking time period. After forming a perfect team, of selected talented students, with all the past experience that I have gained, from creating three versions of INDRO, & with the design of biped humanoid already ready, I am extremely confident of building this humanoid within a year's time.

I have made the list of requirements, for developing this biped humanoid robot, and would love to share it with the company or organization which is interesting in funding this project. This humanoid will only get better, with regular software & hardware updates, and will certainly become India's official entry, in the race of biped A.I humanoid robots, in the upcoming years. I expect this project to kick start, once the needed requirements are fulfilled by the company, or any government organization. The company or government organization will earn equal credentials of the project for providing the necessary support.

This will certainly turn out to be a bench mark project of our country, in the sector of humanoid robots.

# **TECHNICAL SPECIFICATIONS OF INDRO 3.0**

- 1. AUTONOMOUS HUMANOID ROBOT, BASED ON MACHINE LEARNING A.I.**  
: Indro 3.0 is based on machine learning A.I, where predetermined tasks or moves are loaded in the onboard computer of the robot. The robot will only follow or perform tasks which are programmed in its onboard computer, which makes it a much safer and reliable humanoid robot. These predetermined tasks can be run by simply running the code manually or by giving out a voice command, which will be related to the code (voice command still under development).
- 2. 47 AXIS (JOINTS), WITH SIMILAR D.O.F OF A HUMAN BEING:** Indro 3.0 has 47 axis in total or you can also say it's a robot with 47 DOF (degree of freedom). It is not only the tallest humanoid robot of India standing 6 feet tall, but is also the only humanoid robot of India with 10 functional fingers. These entire axis are autonomously controlled by its onboard microcomputer, with custom written algorithms.
- 3. MULTIPLE IDENTICAL SENSORS, WITH FEED BACK :** Indro 3.0 has multiple sensors like motion, gyro, heat, pressure, gas as of now, and will get more add on in the future as per requirement.
- 4. FACE DETECTION, WITH ONBOARD DATABASE:** Indro 3.0 has a 4k camera which is calibrated with a custom made data management system which can detect and store approximately 10,000 faces in a time span of 9 hours. The face detection system also keeps a 4k quality video log with an onboard recording capacity of 8 terabytes (8000 gb). The humanoid can be trained with a data base of hundreds of different individuals, to which the robot will warn the user on capturing that particular person on its camera. This is an incredible security feature which can be used to monitor high profile facilities or events.

- 5. VOICE PROCESS, FOR REAL TIME COMMUNICATION:** Indro 3.0 has a inbuilt Google assist calibrated with a 1000 watt onboard audio system, which enables the robot to communicate flawlessly, with large numbers of people in a indoor or outdoor event. The humanoid also has chat boot software to communicate in real time.
- 6. CUSTOM MADE, HIGH TORQUE SERVOS (MADE FROM SCRATCH):** The most important hardware in INDRO 3.0 are its custom made high torque servo motors, which range from 350 kgs cm torque to 900 kg cm torque. These heavy duty high torque motors are made right inside my laboratory which enables the 6 feet tall, 48kg humanoid to function flawlessly. The humanoid can also lift 2.5 kg with its hands and carry 250 kg payload on its rover. These servos are tested for over thousands of hours with minimal maintenance, and operate 9 hours at stretch without heating at a wide range of indoor and outdoor events.
- 7. CUSTOMLY ASSEMBELLED, ONBOARD HIGH SPEED MICROCOMPUTER:** INDRO 3.0 has a multi-core, single board microcomputer as of now, which takes care of all the functions. A multiple board (stacking) mini high performance computer is underdevelopment for a biped humanoid robot (upcoming project).
- 8. THE SOFTWARE & HARDWARE, IS SPECIFICALLY DESIGNED FOR SAFEST HUMAN INTERACTIONS.**
- 9. CAN ADJUST ITS HEIGHT BETWEEN 6 TO 5 FEET WITH A LINEAR SERVO.**
- 10. 240 KG PAYLOAD ROVER (CAN EASILY CARRY TWO ADULTS).**
- 11. UNLIMITED RANGE OF WIRELESS OPERATION IN CASE OF PREDIFINED TASKS.  
(CONTROLLED VIA REMOTE SERVER)**

## **WHAT IS INDRO 3.0, & WHAT IT CAN DO?**

INDRO 3.0 is just a speck of my ideas, which I transformed into reality from imagination, as people cannot see, or touch your imaginations, unless they are manifested into reality. After going through the video, & above mentioned technical specification, you would have certainly got a fair idea about INDRO 3.0.

Being a 47 axis autonomous humanoid robot, it can easily accomplish a wide range of tasks, which human beings are capable of performing. The onboard microcomputer, acts like a brain of the robot, which controls each & every component of the robot precisely. The numerous identical sensors, give feedback to the onboard computer & vice versa. INDRO 3.0, is based on machine learning A.I, it means it is capable of accomplishing tasks autonomously, which are pre-programmed in its onboard computer. The robot is continuously feed with algorithms, out of which the robot selects the required one, when commanded, (This is something similar to, playing chess with a computer). It's like a very obedient servant, who will follow your orders, without further questions asked. This makes 3.0, a much safer and useful robot, as it will only perform the tasks, which are preloaded in its data base, without causing inconvenience or harm.

So currently INDRO 3.0 is like a new born baby, who is learning a lot of new things from its creator. The data base of 3.0, is updated every now and then by its maker, and will get bigger & better with more & more hours of programming into it, this will further make it a much more smarter & efficient humanoid robot, in the coming days. INDRO 3.0 can also recognize people's faces, according its onboard data base. A few functions are under testing mode in my Lab as of now, but will soon get onboard after some fine tuning. Unlike INDRO 3.0, the other A.I robots which are based on neural network develop their own algorithms, according to their surroundings. It is certainly a much more complex piece of technology, but at the same time, it comes with a certain amount of risk, & series of malfunctions.

Watching INDRO 3.0 live in action, is certainly a treat to the eyes, therefore INDRO'S creator is looking forward to utilize INDRO 3.0, for all kinds of events, advertisements, television shows, product launch & tech fest. It's a perfect way, to utilize a one of a kind humanoid robot, which proudly mentions, "made in India"!

## STORY OF MAKING INDRO 3.0

INDRO 3.0 was a humble attempt, to create a life sized humanoid robot, right inside my, minimally equipped home based Lab. Out of the 44 innovations, that I had designed on paper, I selected the humanoid robot, which was the most challenging of them all. To manifest these ideas into reality, I went through a series of problems & failures, which indeed were the most priceless lessons to be learned. This is when I realized, that to build a prototype out of the designs, I had to be something more than just an innovator. After creating INDRO (the first successful version released in May 2016) & INDRO 2.0 (the upgrade of INDRO released in September 2017), I decided to make a completely new humanoid robot, as I was not satisfied with the performance of the upgraded version 2.0. It was a calculated risk that I took, and there was no margin for error this time. INDRO 3.0 was built to reality from scratch, in a time period of less than 7 months, by a one man team, with the most limited resources, space, equipments, man power, time & money. Usually to create a life size humanoid robot, a team of minimum 8 to 10 people is needed, that too with different set of expertise, & knowledge base. But in my case, I had to play all the different roles by my selves, due to lack of almost everything that was needed to build this humanoid. Instead of complaining about the so many things that I didn't have, I just focused on whatever little I had, and I got started. The past experiences that I had gained in my 11 years of R&D in robotics, were the most power tools that I could ever use, in the creation of this humanoid. These experiences compensated for all the other shortcomings that I faced, while building this robot. I remembered my mentors; (Respected A.P.J Abdul Kalam Sir's) golden words, that "let difficulties know that you too are difficult", and kept going. Innovation is a continuous process, so you can never say that you're done with it, therefore I will keep on innovating & prototyping till my time comes. Jai Hind!

# MEDIA COVERAGE & EVENTS OF INDR0 (2016-17)



12 mid-day our city  
Friday, June 24, 2016, Mumbai. web www.mid-day.com, twitter @mid\_day

Did you know? The world's largest walking robot is a 51-ft, 11 tonne dragon that also breathes fire. It was designed and built by German company ZOLLNER Elektronik AG.

## 6.5-ft-tall humanoid is Goregaon man's 9-year labour of love

Santosh Hulawale, a networks hardware engineer, spent ₹20 lakh on making INDR0

**MALEEVA REBELLO**  
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The first thing that catches your eye after entering Santosh Hulawale's Goregaon East residence is the presence of a black and white, Star Wars storm trooper-like humanoid in his living room. The machine rolls on wheels, shakes hands and introduces itself as INDR0 — a shorter version of India's Robot. It then gives details of its height and weight.

Santosh (35) took nine years to build the latest humanoid which stands 6.5 feet tall and weighs about 55 kg. "I started tinkering with stuff to see how it works at the age of 6. I was inspired by this TV show called Robotix. I made my first robot at 11 and then another one at 13. My father always felt that I was wasting time and asked me to focus on academics."

A networks hardware engineer, Santosh claims he learnt robotics by trial and error.

"I saw the humanoids online and found them very amateur. This inspired me to build one for myself and so I started working on it in 2007. I failed twice in 2008 and 2012 and the failure reduced me to tears, as I had invested a lot of hard work and money in the project. I operate a small-time computer business and all the profits earned were diverted towards making INDR0. So far, I've

spent ₹20 lakh on developing its hardware and software," said Santosh.

**Family support**

Unlike his father, Santosh's mother Kavita supported him through the highs and lows he experienced in the last nine years. "He would spend up to 15 hours a day working on his robot. He would barely step out of the bedroom, which looked like a combination of a science lab and a carpenter's workshop. My husband was a mill worker and science was never our cup of tea. But I always believed in my son," she said.

Commenting on his passion for building robots, his wife Shamaal added, "When we got married in December 2014, I was unaware that he was building a robot. After seeing how passionate he was about the project, I told him to go ahead with it. He started building INDR0 in March 2015 and finished it this May."

**Composition**

Listing the raw materials he used to build the humanoid, Santosh said he used aluminium, wood, steel, vinyl, plastic, cardboard, cloth, etc. "I have 16 prototypes in mind and want to make robots to help the disabled, fight fire, etc. At present, INDR0 can easily lift objects weighing up to 150 kg," he added.

Stating that he now wants to build



advanced level humanoids, Santosh said his current concept is very basic. "The robot is being operated using a control panel and a joystick, much like a remote-controlled toy car but with advanced features. I had limited funds and had to do everything alone. For my next project, I have ideas for an advanced humanoid. All I need to materialise my vision are funds and a few helping hands. Robotics can't be taught, it is all in the head," he added.

**Experts sceptical**

Shivaprasad Khened, director at the Nehru Science Centre, said, "Building a robot is easy, since there are a number of Lego kits available with detailed instructions. However, it is impossible to make a fully operational robot at home. A few of its parts require lathe (a machine tool for shaping metal or wood). At 6.5 feet, it could well be the tallest humanoid but the purpose behind making it also counts."

Kavi Arya, associate professor at IIT-B and principal investigator at robotics lab e-Yantra, said, "Size is not an important factor when compared to the robot's purpose. The precision of its movements, its functional capabilities and tasks it can perform are more important. The nature of the movement — whether crude or fine — also needs consideration. Since, I haven't seen the robot, it would be unfair of me to comment on it."

**What is a humanoid?**

- It is a robot resembling a human body
- It might be for functional purposes such as interacting with human environments, or for experimental purposes
- Some humanoids are built waist above
- A few even have heads with human facial features like eyes and a mouth

# not think!

EVEN THE BEST HUMANOID ROBOTS IN THE WORLD CAN ONLY DO ONE THING WELL. THEY CAN EITHER SPEAK, OR MOVE, OR PLAY CHESS. MULTI-TASKING IS THE NEXT BIG CHALLENGE.



## IT'S A BOT TIME

Desi humanoid robots are turning up at banks, offices and events. They're still simple creations, but they show the way forward, say their makers. The eventual aim? To be bot suppliers to the world

### Parul Marwaha

If you're standing in front of a bank, you're not likely to see a humanoid robot. But if you're in a bank, you might. In fact, you might see a humanoid robot in a bank, office, or event. They're still simple creations, but they show the way forward, say their makers. The eventual aim? To be bot suppliers to the world.

The novelty of the current batch of humanoid robots is that they are being used in real-world settings. As scientists, we were excited about exploring how far we could go in creating the perfect humanoid — that mimics an unman, shows emotion and understands context in conversation.

### RE-VISITING A SIMO

When you think of a humanoid robot, you think of a robot that looks like a human. But what if you think of what they can do? In this case, it's not about how they look, but what they can do. They are being used in real-world settings.

Simo is a humanoid robot developed by the Indian Institute of Space Technology and Research. It is a humanoid robot that can walk, talk, and interact with humans. It is being used in various settings, including in a bank and in a hospital.

Parul Marwaha is a journalist who writes about technology and robotics. She is currently based in Mumbai, India.



## FAMOUS HUMANOID ROBOTS FROM AROUND THE WORLD



**SOPHIA:** Developed in 2016 by the Hong Kong-based Hanson Robotics, Sophia is the first humanoid robot to be granted citizenship by a country (UAE).



**PEPPER:** The most widely used humanoid robot, Pepper was created in 2015 by Japanese Softbank Robotics.



**ATLAS:** This is a robot that can do a backflip, and it's not just flexing a muscle. It was developed by the US-based Boston Dynamics in 2012.



**ASIMO:** A small, advanced humanoid robot, ASIMO was developed by Honda in 2000. It is the smallest humanoid robot in the world.

(Above) Sophia, a humanoid robot, can be found at the United Arab Emirates, or in the UAE. She can talk, sing, and dance.

(Above left) Pepper, a humanoid robot, is used in various settings, including in a bank and in a hospital.

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THE BIG STORY

विस्तीर्ण कॅम्पस, वाढत जाणारी विद्यार्थ्यांची गर्दी आणि जुन्या शस्त्रांचं भरवण्यात आलेलं प्रदर्शन... असा माहोल वाचून चमकलात का? होय, हे सगळं के. जे. सोमय्या कॉलेज ऑफ इंजिनीअरिंगच्या 'अभियांत्रिकी २०१८' या फेस्टिव्हलमध्ये पाहायला मिळालं.

कार्तिक जाधव, गुरु नानक कॉलेज

इंजिनीअरिंग कॉलेजविश्वात मानाचा समजला जाणारा के. जे. सोमय्या कॉलेजचा अभियांत्रिकी हा फेस्ट यंदा थोडा हटके पद्धतीनं साजरा झाला. 'नो थीम ऑली टेक फील' असं म्हणत फेस्टिव्हलमध्ये अभियांत्रिकी क्षेत्राशी निगडित पन्नासहून अधिक स्पर्धा, व्याख्याने आणि प्रदर्शनांचे आयोजन करण्यात आलं होतं. यात

## रोबोची धमाल, प्रदर्शनाची कमाल



हॅकेयॉन, रोबोटिक स्पर्धा, टेक्निकल पेपर प्रेझेंटेशन आणि झेरो एनर्जी बिल्डिंग अशा तांत्रिक स्पर्धा तर तंत्रज्ञानावर आधारित पॅनेल सेशन्स घेण्यात आले. शिवाय देशाच्या सुरक्षेसाठी लढणाऱ्या सैनिकांच्या शस्त्रांचं प्रदर्शन फेस्टमध्ये भरवण्यात आलं. साधारण ५०हून अधिक कॉलेजांनी फेस्टमध्ये आपला सहभाग नोंदवला. दोन दिवस कॅम्पसमध्ये उत्साहाचे रंग भरणाऱ्या 'अभियांत्रिकी'ला यंदा शालेय विद्यार्थ्यांनीही हजेरी लावली.

### शस्त्र आणि अस्त्र

सीमेवर आपला जीव पणाला लावणाऱ्या आपल्या सैनिकांच्या शस्त्रांचं प्रदर्शन या फेस्टमध्ये भरवण्यात आलं. यात विविध रायफल, मशीन गन आणि पिस्तुल यांचा समावेश होता. याचबरोबर शत्रूच्या हल्ल्याला चोख प्रत्युत्तर देताना त्यांच्यावर बॉम्बचा मारा करणारे रणगाडे पाहण्याचा योगही इथं जुळून आला होता.

### रोबोची कमाल

भारतीय सैनिकांनी कॅम्पसमध्ये प्रवेश केला आणि त्यांच्या स्वागतासाठी चक्क ह्यूमनॉइड रोबोने नृत्य सादर केलं. तसेच 'इंडिरा' या नावानं ओळखला हस्तांदोलन करणारा रोबो हा विशेष आकर्षणाचा भाग होता.



Mumbai-based innovator Santosh Hulawale was back at Kshitij, this time with Indro 3.0. In 2017 he was here with Indro, his first humanoid robot. "This is actually a different robot, not merely an upgrade," Santosh explained. "It is based on a machine learning artificial intelligence (AI) platform, which means this robot can do complex tasks on receiving voice commands. Unlike robots based on AI neural networks, which enable the robots to act on their own, Indro 3.0 performs only those actions that are programmed in its on-board computer, making it a safer and more reliable humanoid robot."



(Above) Tetsuji Katsuda's Robot Band filled the Sir J.C. Bose Laboratory Complex foyer with its electronic music. The band comprised Kosan-Kun 1 on the colour chime bars, Tomato-Chan with the voice synthesis and Kosan-Kun 2 on acrylic drums, accompanied by Chibisan-Kun, which wrote good luck messages for the fascinated audience. We also spotted paper robots (above) marching in place next to the band. Created by Sho Yoshida, the robots are made of thick paper; plastic straws, bamboo skewers, rubber bands and a single piece of metal, and are powered solely by wind energy.



(L-R) Vinay Bharadwaj and Yagna Sai from Space Kidz India had flown in from Chennai with a model of a moon rover that was among the five finalists in the Google Lunar X Prize, where a first prize of \$20m was at stake. The rover was built by an international collaboration called Team Synergy Moon, which included Space Kidz India. Also on display was a small, toy-like, cubic object (inset), which turned out to be a satellite! Named KalamSat in honour of former President A.P.J. Abdul Kalam, the probe was 3D-printed out of reinforced carbon fibre polymer; weighs just 64g and was built by a seven-member team that included Sai, Vinay and 18-year-old Rifath Sharook, who was the lead scientist. KalamSat was launched into orbit by NASA last year and returned to terra firma after spending four hours in space.





**IIT KHARAGPUR 2017**



**IIT BOMBAY 2016**



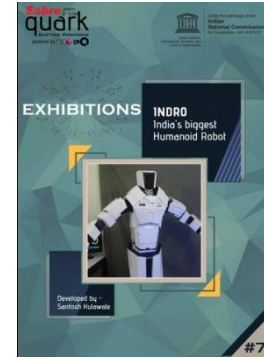
**IIT KHARAGPUR 2018**



**NIT KURUSHETRA 2017**



**IIT KANPUR 2017**



**BITS PILLANI GOA 2017**



**IIT BHU VARANASI 2017**



**IIT BOMBAY 2017**



**NIT TRICHY 2017**



**VJTI 2016**



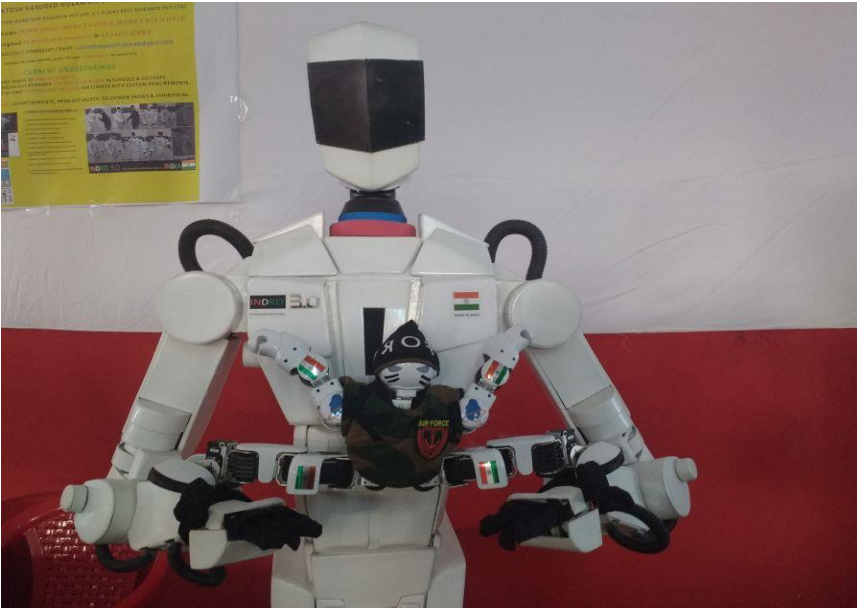
**SRM CHENNAI 2017**



**IIT GUWAHATI 2017**



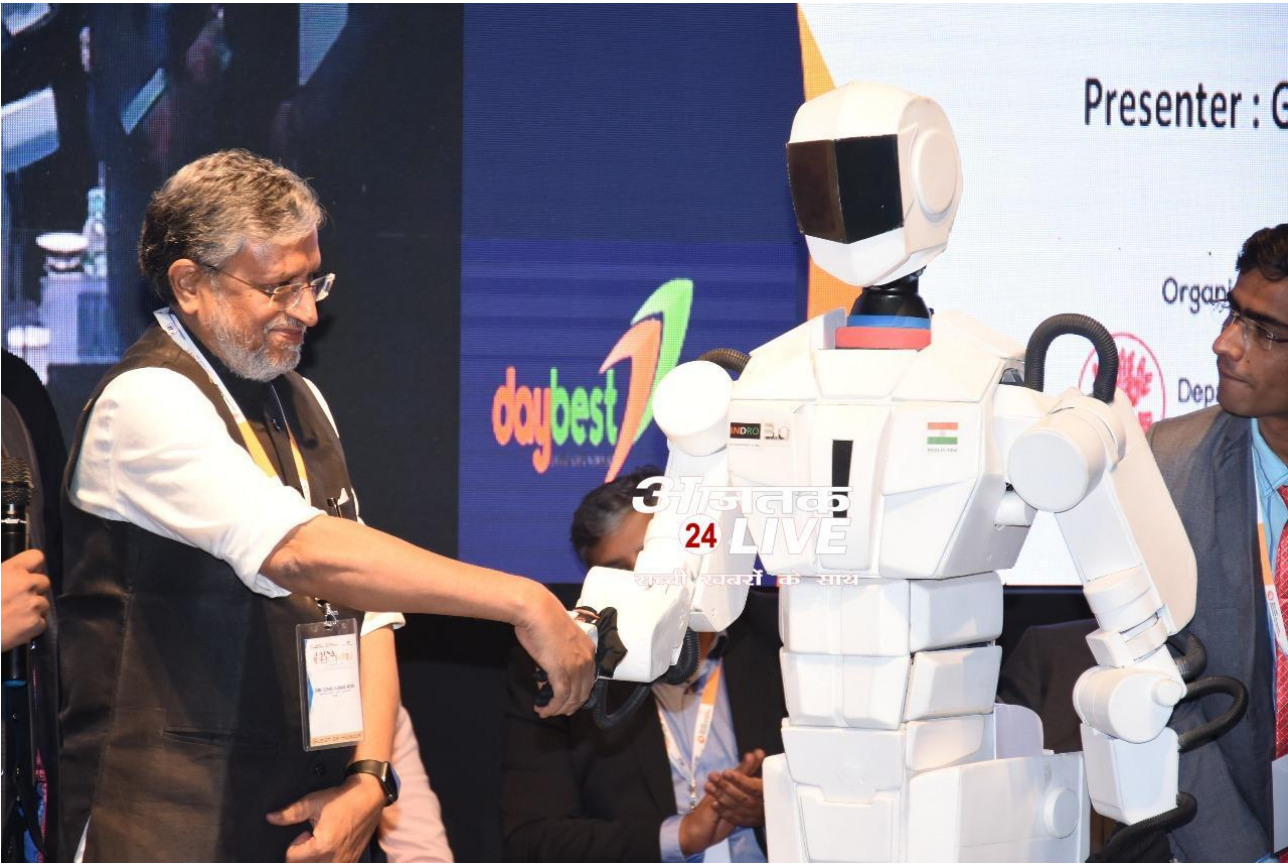
@ MIND SPARK, COEP ACEDMIC COMPLEX PUNE



@ ABHIYANTRIKI, SOMAYA E.C MUMBAI



@ ABHIYANTRIKI, SOMAYA E.C MUMBAI



**Sushil Kumar Modi**

2 hrs · 🌐

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समारोह का उद्घाटन करते हुए।

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## रोबोट ने डिप्टी सीएम से मिलाया हाथ

पटना : राज्य सरकार की ओर से आयोजित आइडियाथॉन 2018 में एक रोबोट को भी उतारा गया है, जो सोमवार को मंच पर आते ही आकर्षण का केंद्र बन गया। उसने उपमुख्यमंत्री सुशील कुमार मोदी से हाथ मिलाया और चंद्र मिनाट में आइडी के महत्व को बताया। रोबोट ने सभागार में बैठे दर्शकों की ओर

हाथ हिलाया और ताली बजाई। सूचना एवं प्रौद्योगिकी विभाग के सचिव राहुल सिंह ने अतिथियों का स्वागत करते हुए मंच से कहा कि बिहार में पहली बार आयोजित आइडियाथॉन में 36 डेलीगेट की भागीदारी है। इनमें बहुराष्ट्रीय कंपनियां, सबसेसफल स्टार्टअप एक्सपर्ट्स, वेबर केप्टलिस्ट, एंजेल

इन्वेस्टर भी शामिल हैं। बिहार स्किल डेवलपमेंट मिशन के सीईओ एवं क्रम संसाधन विभाग के प्रधान सचिव दीपक कुमार सिंह ने बताया कि हाल के वर्षों में आइडी सेक्टर में बिहार में महत्वपूर्ण कार्य हुआ है। ऐसे आयोजन से बिहार में आइडी सेक्टर के साथ-साथ स्टार्टअप को और तेजी से रफ्तार मिलेगी।



आइडी इन्क्यूबेशन सेंटर की स्थापना की जा रही है। आइडियाथॉन बिहार में 30 हजार वर्गफीट में 47 करोड़ रुपये की लागत से इन्क्यूबेशन सेंटर का निर्माण किया जा

रहा है। राजगीर में आइडी सिटी के लिए जमीन उपलब्ध करा दी गई है।

300 से अधिक कॉलेजों में फ्री वाई-फाई सुविधा : उपमुख्यमंत्री

सुशील कुमार मोदी ने आइडी सेक्टर में सुबे की प्रगति की बर्चा कसे हुए कहा कि बिहार में शिक्षा, कृषि, वयोग समेत अन्य क्षेत्र में आइडी का उपयोग तेजी से हो रहा

है। प्रदेश के 300 से अधिक कॉलेजों में फ्री वाई-फाई की सुविधा दी जा रही है। 5000 से अधिक पंचायतें ब्रॉडबैंड से जुड़ चुकी हैं।

# पटना आइडियाथॉन • डिप्टी सीएम बोले- देश से गरीबी नहीं मिटी, ऐसा आइडिया दें कि दूर हो जाए जो इनोवेट करेगा, वही दुनिया पर राज करेगा, चौथी औद्योगिक क्रांति का वाहक बने इंडिया

पॉलिटिकल रिपोर्ट | पटना

उपमुख्यमंत्री सह सूचना एवं प्रौद्योगिकी मंत्री सुशील कुमार मोदी ने कहा कि आज तक दुनिया में जो तीन औद्योगिक क्रांति हुई है उसका लाभ भारत को बहुत नहीं मिला, लेकिन चौथी औद्योगिक क्रांति का वाहक भारत को बनना चाहिए। चौथी औद्योगिक क्रांति में आर्टिफिशियल इंटेलिजेंस, क्लाउड चैन, रोबोटिक्स और बिग डाटा आदि का उपयोग कर भारत महत्वपूर्ण स्टेक होल्डर बन सकता है। देश और राज्य में प्रतिभाशाली लोगों की कमी नहीं है। स्टार्ट अप से उन्होंने आग्रह किया कि वे ऐसा इनोवेशन करें, जो गरीबों की जिंदगी बदलने में मददगार हो। मुझे तो अपने जीवन काल में गरीबी मिटती नहीं दिख रही है, आप ऐसा इनोवेशन कीजिए जिसमें आपके जीते जो गरीबी (स्लैम) प्रोजेक्ट्स को रखने की वस्तु हो जाए। स्टार्ट अप से जलवायु परिवर्तन, जल संरक्षण, कुपोषण, कृषि उत्पादकता आदि वैश्विक चुनौतियों को नवाचार एवं नई तकनीक द्वारा निपटने का आवाहन किया। मोदी सोमवार को सरदार पटेल भवन (पुलिस मुख्यालय) के सभागार में सूचना एवं प्रौद्योगिकी, बेलट्रॉन और सीआईआई द्वारा आयोजित पटना आइडियाथॉन 2018 को संबोधित कर रहे थे। उन्होंने कहा कि नवाचार और उद्यमिता को 21वीं सदी का मूल मंत्र बताते हुए कहा कि इसका उपयोग गरीबी उन्मूलन में किया जाना चाहिए। मोदी ने कहा इस देश को आज नए-नए आइडियाज की जरूरत है और इनके पास बेहतर आइडियाज होंगे वही देश पर राज करेगा। उपमुख्यमंत्री ने कहा कि बिहार में बेहतर आइडियाज की जरूरत है ताकि इस राज्य को देश की अग्रणी पंक्ति में खड़ा किया जा सके।



पटना आइडियाथॉन 2018 में रोबोट से हथ मिलाते डिप्टी सीएम सुशील कुमार मोदी। साथ में अन्य अतिथि।

## आईटी के क्षेत्र में तेजी से बढ़ रहा बिहार

उपमुख्यमंत्री ने कहा कि आईटी के क्षेत्र में बिहार तेजी से बढ़ रहा है। बिहार देश का पहला राज्य है जो स्टार्ट अप के लिए 10 लाख रुपया सीड मनी देता है। सरकार ने स्टार्टअप के लिए 500 करोड़ रुपए का वेंचर फंड भी बनाया है। पटना के पाटलिपुत्र औद्योगिक क्षेत्र में साफ्टवेयर

टेक्नोलॉजी पार्क (एसटीपीआई) केंद्र के क्षमतावर्धन और एक लाख वर्गफीट अतिरिक्त कार्यक्षेत्र के निर्माण के लिए 26 करोड़ उपलब्ध करा रही है। आईटी सचिव राहुल सिंह ने कहा पटना में आईटी टावर के निर्माण का काम चल रहा है और यहां उन्हें तमाम तकनीकी सुविधाएं उपलब्ध होंगी। मौके पर

श्रम संसाधन विभाग के प्रधान सचिव दीपक कुमार सिंह, एचपी के कंट्री मैनेजर कमल कश्यप, आईआईएम गया के डायरेक्टर डॉ. विनीता सहाय, सीआईआई बिहार के हेड प्रभात कुमार सिन्हा और रीजनल डायरेक्टर नीता करमकार और केपीएमजी के रामेन्द्र वर्मा आदि उपस्थित थे।

# गरीबी मिटाने को आगे आए आईटी क्षेत्र : मोदी

उपमुख्यमंत्री ने किया आइडियाथॉन 2018 समारोह का उद्घाटन, देशभर से जुटे आईटी विशेषज्ञ

सहारा न्यूज ब्यूरो  
पटना।

उपमुख्यमंत्री सुशील कुमार मोदी ने यहां देशभर से आए आईटी क्षेत्र के विशेषज्ञों से ऐसी सोच, ऐसी आइडिया व इनोवेशन की नयी तकनीक इजाजत करने पर बल दिया जो बिहार समेत पूरे देश से गरीबी को मिटाने में कामयाब हो। उन्होंने कहा कि स्टार्टअप का मकसद गरीबी मिटाने के लिए हो। उन्होंने कहा कि एक इनोवेशन लाखों की जिंदगी बदल सकती है। जो इनोवेशन करेगा वह विश्व में राज करेगा।

श्री मोदी ने यहां नवनिर्मित सरदार पटेल भवन में आईटी क्षेत्र के विकास के लिए प्रदेश में पहली बार आयोजित आइडियाथॉन 2018 समारोह का उद्घाटन किया। इस मौके पर पटनाबासी व माइक्रोसॉफ्ट के कंट्री हेड व प्रबंध निदेशक मनीष प्रकाश, आईआईएम बोध गया की निदेशक विनीता सहाय, सीआईआई के को-चेयरमैन विनय वर्मा, सूचना प्रौद्योगिकी विभाग के सचिव राहुल सिंह, श्रम संसाधन



समारोह में उपमुख्यमंत्री सुशील कुमार मोदी को सम्मानित करते पदाधिकारी।

विभाग के प्रधान सचिव दीपक कुमार सिंह व उद्योग विभाग के तकनीकी निदेशक रवीन्द्र प्रसाद मौजूद थे।

दरअसल उपमुख्यमंत्री सुशील कुमार मोदी ने देशभर से आए स्टार्टअप से जलवायु परिवर्तन, जल संरक्षण, कुपोषण, कृषि उत्पादकता आदि वैश्विक चुनौतियों से नवाचार एवं नयी तकनीकों द्वारा निपटने का

आह्वान किया। उन्होंने कहा कि कतिपय कारणों से देश तीन औद्योगिक क्रांतियों से लाभान्वित नहीं हो सका। उन्होंने चौथी औद्योगिक क्रांति में आर्टिफिशियल इंटेलिजेंस, क्लाउड चैन, रोबोटिक्स, बिग डाटा आदि का उपयोग कर भारत को महत्वपूर्ण स्टेकहोल्डर बनने का आह्वान किया। नवाचार एवं उद्यमिता को 21वीं सदी



उपमुख्यमंत्री से हथ मिलाते रोबोट आंटे।

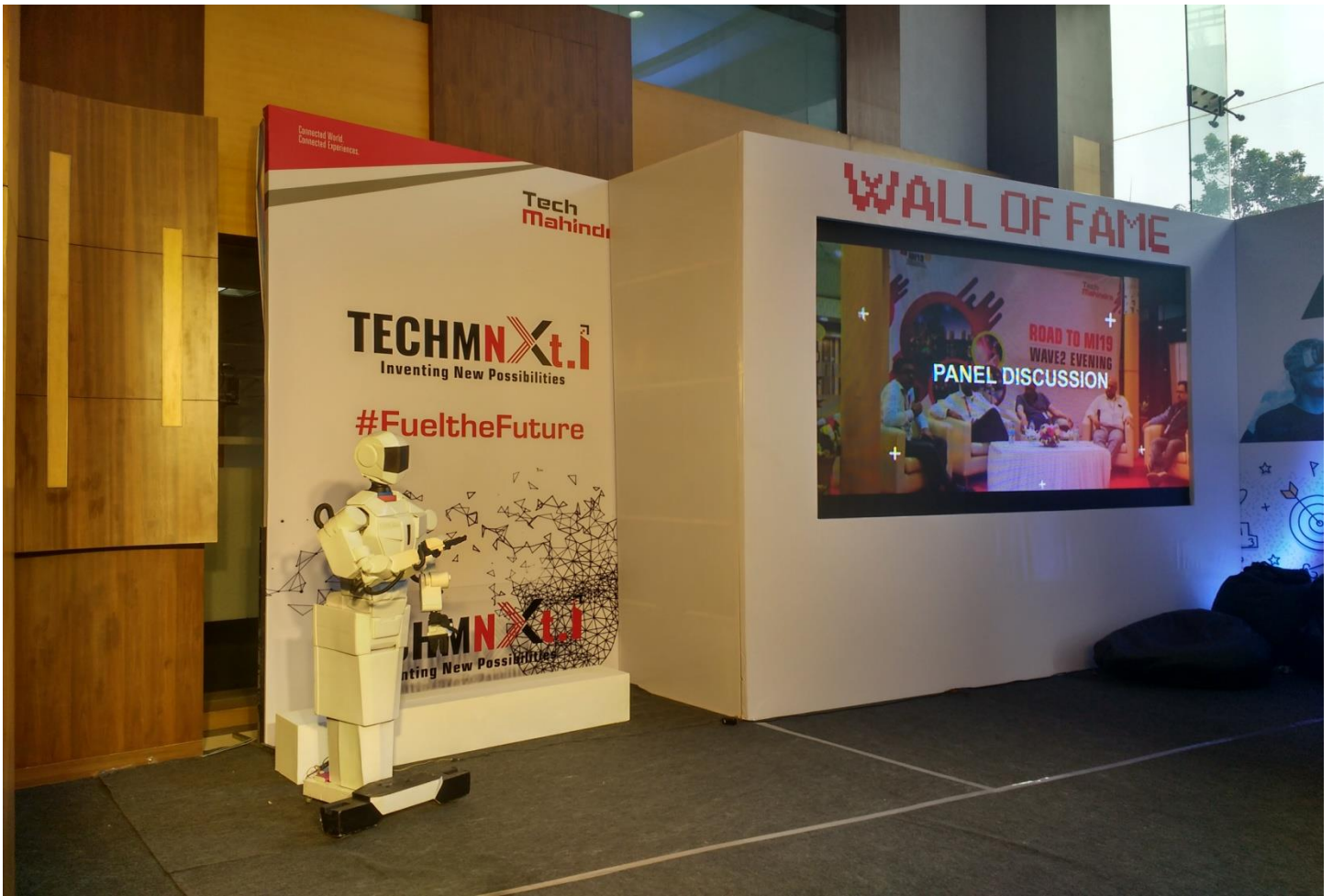
का मूल मंत्र बताते हुए उन्होंने कहा कि इसका उपयोग गरीबी उन्मूलन में किया जाना चाहिए। राज्य सरकार पाटलिपुत्र, पटना स्थित एसटीपीआई (साफ्टवेयर टेक्नोलॉजी पार्क ऑफ इंडिया) केंद्र के क्षमतावर्धन के लिए एक लाख वर्गफीट अतिरिक्त कार्यक्षेत्र के निर्माण के लिए 26 करोड़ रुपये उपलब्ध करा रही है। भगलपुर

एवं दरभंगा में एसटीपीआई केंद्र की स्थापना हेतु 22 एकड़ भूमि नि:शुल्क उपलब्ध करायी गयी है। वीआईटी, पटना में आर्टिटी इनोवेशन सेंटर की स्थापना की जा रही है। आईआईटी, विहारा में 30 हजार वर्गफीट में 47 करोड़ रुपये की लागत से इन्क्यूबेशन सेंटर का निर्माण किया जा रहा है। विहारा में आईटी पार्क एवं राजगीर में

एक इनोवेशन से बदल सकती है लाखों की जिंदगी : उपमुख्यमंत्री माइक्रोसॉफ्ट 10 लाख लोगों को रोजगार देगा : मनीष प्रकाश

आईटी मिट्टी के लिए जमीन उपलब्ध करा दी गयी है। बिहार के 300 से अधिक कॉलेजों में फ्री वर्डफाई की सुविधाएं दी जा रही हैं। 5000 से अधिक पंचायतों गांव वॉर्डवैड से जुड़ चुकी है। श्री मोदी ने सफल आयोजन के लिए सूचना प्रौद्योगिकी विभाग के सचिव राहुल सिंह की कामनी प्रशंसा की। इस मौके पर रोबोट आंटे को पेश किया गया। आन्ट्रे ने मोदी से हथ मिलाया।

कार्यक्रम में बिहारवासी व माइक्रोसॉफ्ट के कंट्री हेड तथा प्रबंध निदेशक मनीष प्रकाश व आईआईएम बोध गया की निदेशक विनीता सहाय ने कहा कि नयी सोच व आइडियाज में पूरे विश्व में शानम करने की क्षमता है। मनीष प्रकाश ने कहा कि माइक्रोसॉफ्ट में 10 लाख इनोवेटिव की नियुक्ति होगी।



# घरच्यांची सेवा-पाहुण्यांचं स्वागत करणारा रोबो

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## BREAKING NEWS

5 वर्षीय शेतकरी किसनराव घ्यार यांची गळफास घेऊन आत्महत्या.



# मराठी तरुणाने बनवला इंड्रो ३.० रोबो

रोबो करणार घरगुती मदतीबरोबर शेती काम

विनायक डिंगे » मुंबई

dvinayak@mymahanagar.com

रजनीकांतचा नुकताच प्रसिद्ध झालेला '२.०' हा रोबोवर आधारित चित्रपट सर्वांच्या पसंतीस पडत आहे. त्याचवेळी मुंबई आयआयटीमध्ये शुक्रवारपासून सुरू असलेल्या टेकफेस्टमध्ये मराठी तरुणाने बनवलेला 'इंड्रो ३.०' हा रोबो सर्वांचे लक्ष वेधून घेत आहे. संपूर्ण भारतीय बनावटीचा असलेला हा रोबो घरातील सर्व कामे करतो, त्याचबरोबर घराची सुरक्षा, लहान मुलांवर लक्ष ठेवणे, अनोळखी व्यक्तीला घरात येण्यापासून रोखणे अशी सर्व महत्त्वाची कामे सहजगत्या करतो. रोबोची उंची व त्याची हालचाल टेकफेस्टला भेट देणाऱ्या प्रत्येक व्यक्तीचे लक्ष वेधून घेत आहे.

सविस्तर वृत्त पान १८

## मराठमोळ्या तरुणाने बनवला नोकरदार रोबोट

सुरक्षेसह ४४ कामांना हातभार; १७ वर्षे अथक परिश्रम

सकाळ वृत्तसेवा

मुंबई, ता. १६ : मुंबईतील एका खासगी अभियांत्रिकी महाविद्यालयात शिक्षण घेतलेल्या मराठमोळ्या तरुणाने अथक परिश्रम घेत आकाशाला गवसणी घातली आहे. जगभरातील तंत्रज्ञांनी विविध यंत्रमानव बनवले आहेत; पण मुंबईतील संतोष हुलावले (वय २७) यांनी १७ वर्षे संशोधन करून ४४ प्रकारची कामे करणारा रोबोट बनवला आहे. आयआयटी मुंबईच्या टेकफेस्ट मधील प्रदर्शनात ठेवलेला 'इंड्रो ३.०' नामक हा रोबोट घराची सुरक्षा करण्यासह नोकरदारप्राप्तीचे काम करतो.

हुलावले यांनी आतापर्यंत तीन रोबोट तयार केले आहेत. संपूर्ण भारतीय बनावटीचा असलेला 'इंड्रो २' हा रोबोट २०१६ मध्ये, 'इंड्रो २.०' हा रोबोट



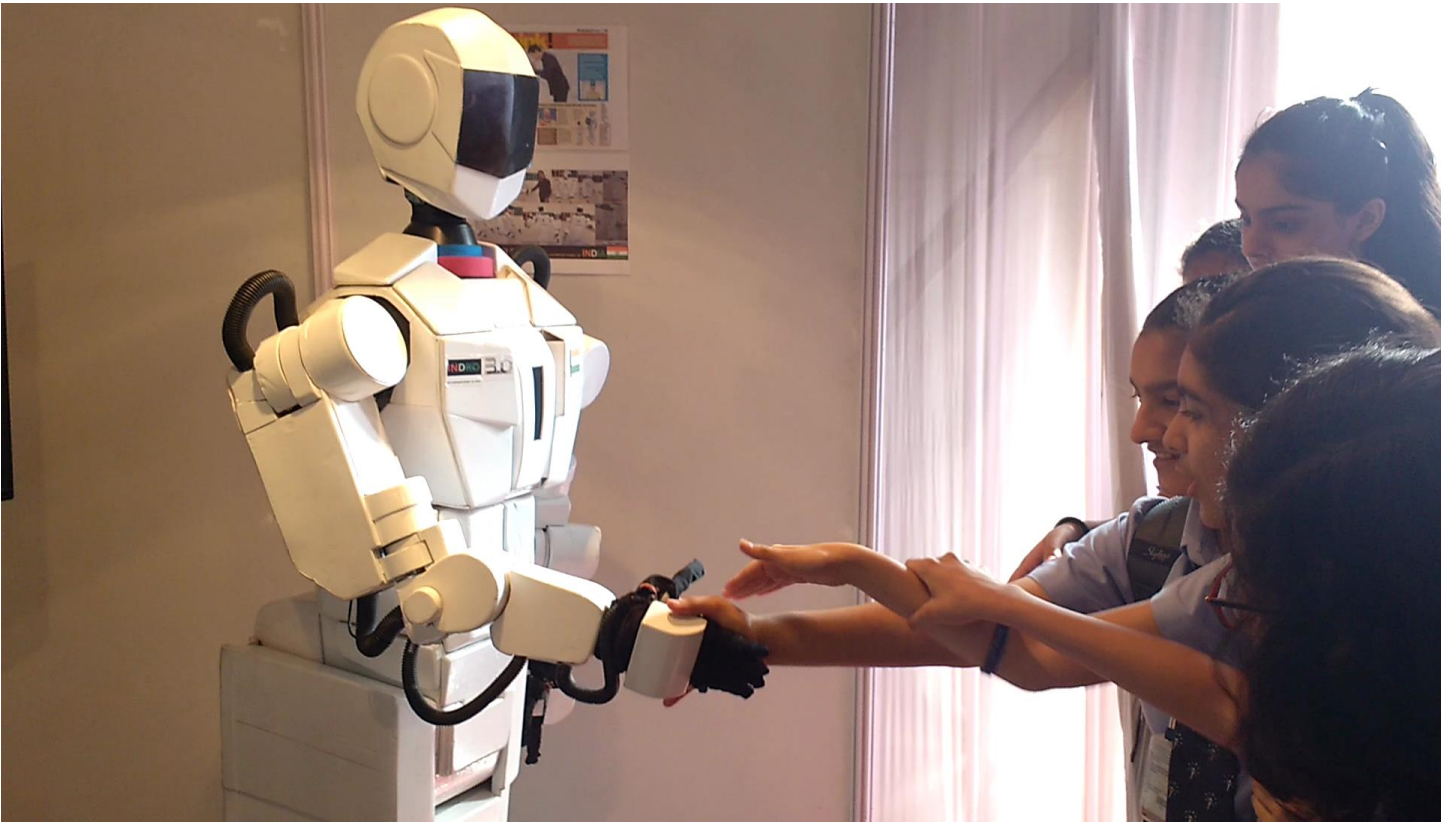
२०१७ मध्ये व 'इंड्रो ३.०' हा रोबोट २०१८ मध्ये बनवण्यात आला आहे. लॉर्निंग पद्धतीचा हा रोबोट दिलेल्या प्रोग्रामनुसार काम करतो.

व्यक्ती ओळखून प्रवेश माहिती दिल्यानुसार हा यंत्रमानव काम करत असल्यामुळे नोकरदार पती-पत्नींना मुलांच्या सुरक्षेसाठी हा

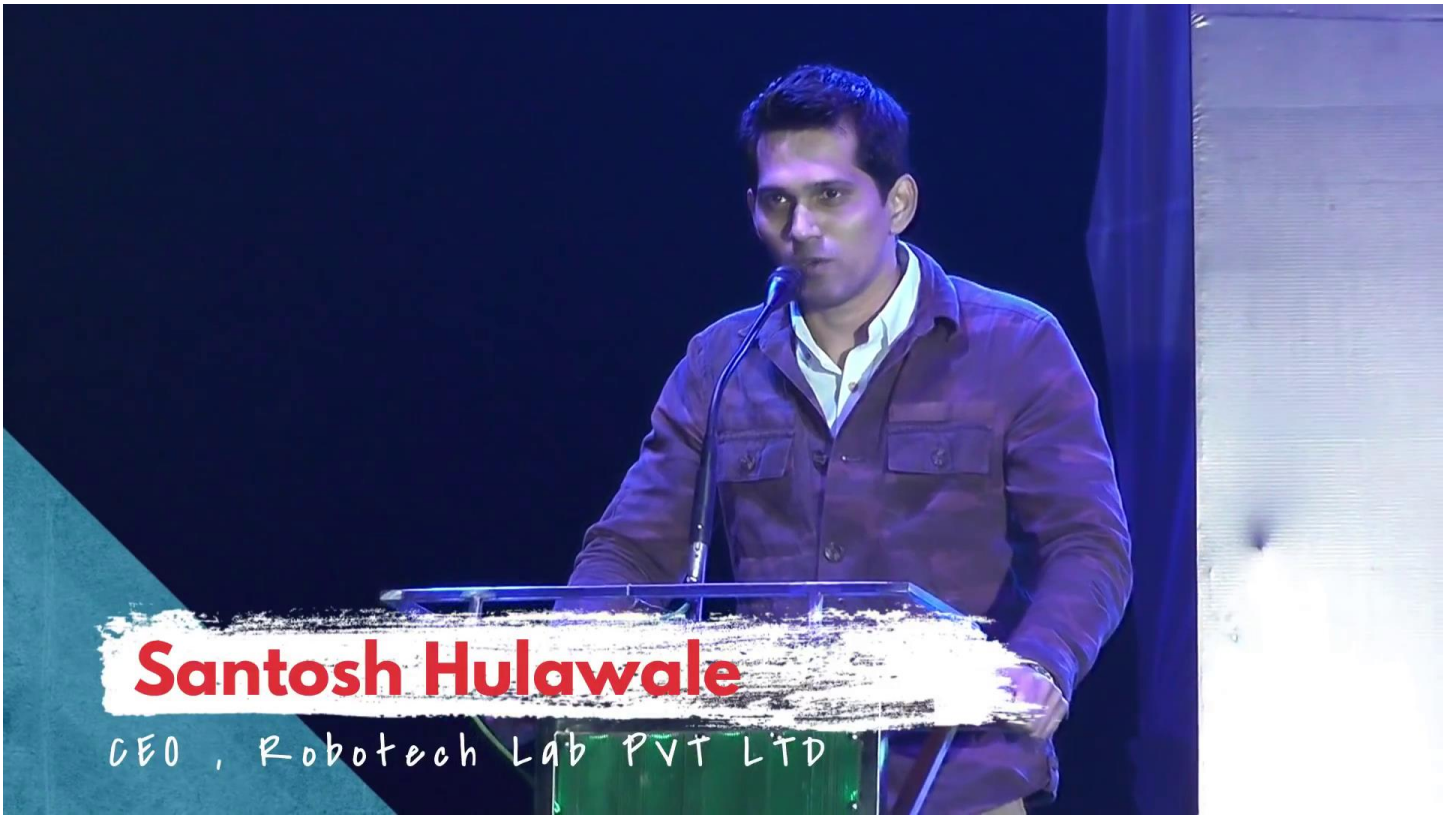
रोबोट फायदेशीर आहे. घरामध्ये लहान मुलांना वेळेत उठवणे, त्याला आवश्यक वस्तू देणे, दवाबाजची कडी लावणे, गॅस बंद करणे अशी विविध कामे हा रोबोट सहजतेने करतो. अनोळखी व्यक्तीला घरात घ्यायचे की नाही, हे ठरवण्याचे कामही रोबोट करतो.

स्वस्त व किफायतशीर दिलेल्या कमांडनुसार रोबोट व्यक्तीचे डोकें दाबणे, हात-पाय चेंपणे अशीही कामे करतो. विदेशी रोबोटच्या तुलनेत हा रोबोट स्वस्त व किफायतशीर असल्याचे हुलावले यांनी सांगितले. रोबोट सुरक्षित ठेवण्यासाठी संतोष यांनी आपले घरच निवडले आहे. याच घरात त्यांची प्रयोगशाळा आहे. संशोधनाची गोडी आणि अथक परिश्रम केल्याने आता यश मिळाल्याचे त्यांनी सांगितले.

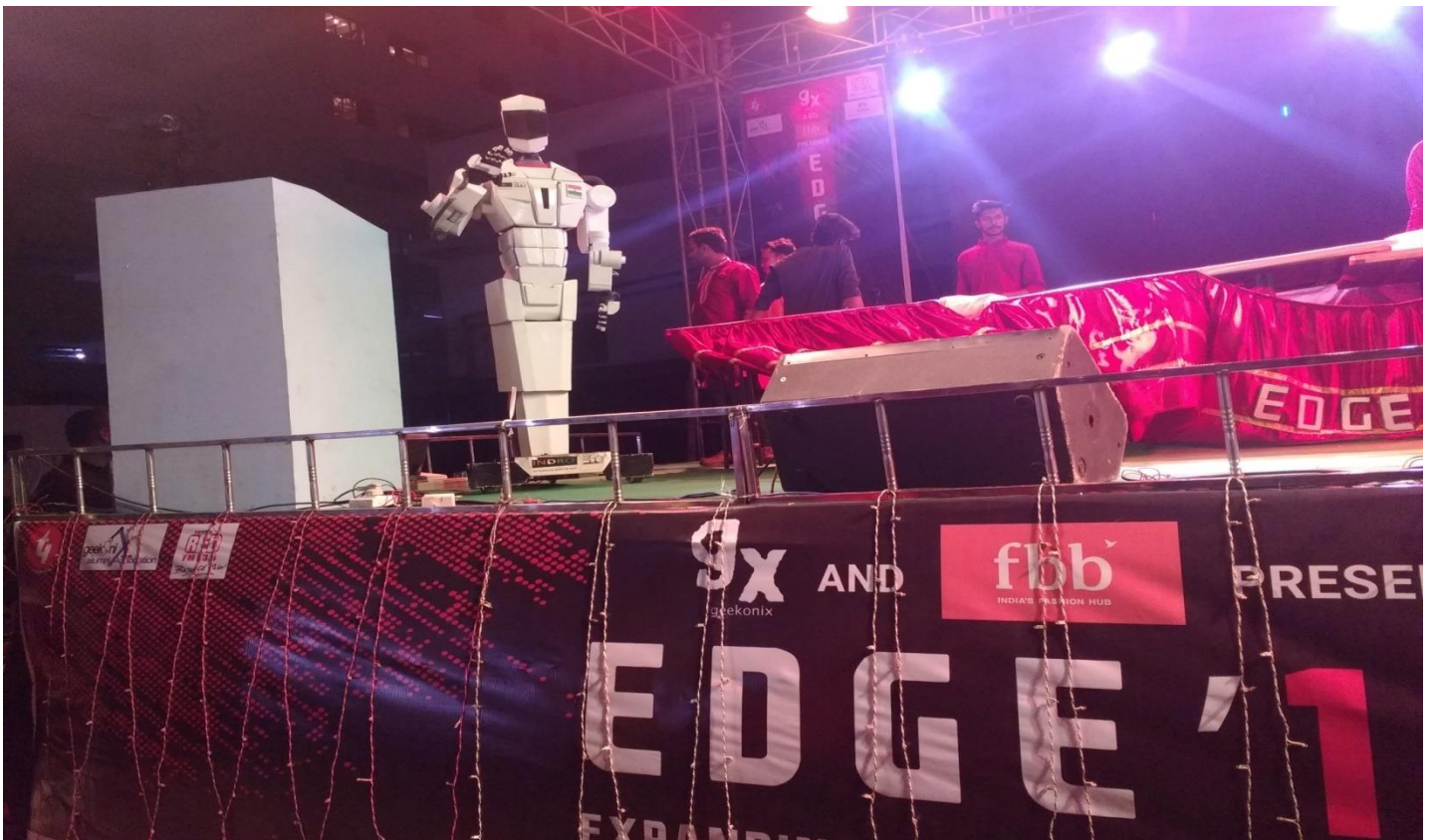








GUEST LECTURE AT SUIT 2019 (ODISHA)





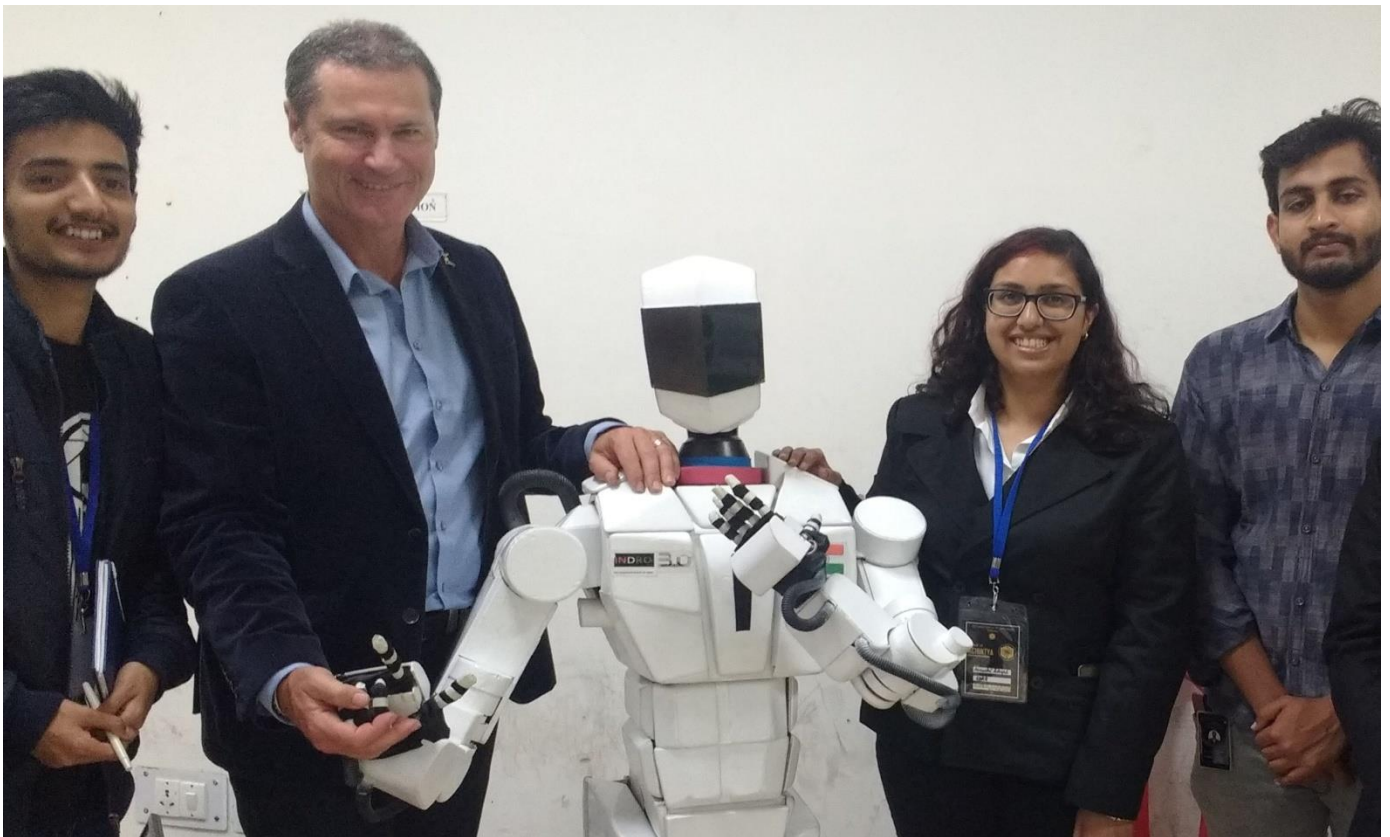
WORK SHOP @ ISB&M SCHOOL OF TECHNOLOGY (2018)



EXHIBITION @ IIT ROORKEE (COGNIZANCE 2019)



**EXHIBITION @ IIT BHUBHANESHWAR (WISSENAIRE 2019)**



**EXHIBITION @ NIT HAMIRPUR (NIMBUS 2019)**



EXHIBITION @ NIT JAMSHEDPUR (OJJAS 2019)



GUEST LECTURE @ NIT JAMSHEDPUR (OJJAS 2019)

# छात्रों ने रोबोट और ड्रोन की बारीकियां जानी

**रुड़की।** आईआईटी रुड़की में चल रहे तकनीकी महोत्सव कॉग्निजेंस के दूसरे दिन आकर्षण का केंद्र इंड्रो रोबोट रहा। इंड्रो रोबोट को एलएचसी हाल में लगी प्रदर्शनी में लगाया गया। इंड्रो रोबोट की खासियत उसके पास आने पर वह हाथ मिलाता है और आरती करता है। इसी के साथ में सभी को नमस्कार करता है। रोबोट के निर्माता संतोष हुलवाला ने बताया की रोबोट की लम्बाई छह फीट है और इसकी प्रोग्रामिंग पर शोध किया जा रहा है। उन्होंने कहा की आने वाले

समय में रोबोट इंसानो की तरह काम करता नजर आएगा। उन्होंने कहा की यदि गलती से आपका गैस खुला रह गया तो रोबोट को सेंसरों के जरिये पता चल जाएगा और वह उसे बंद कर देगा।

संतोष हुलवाला ने बताया कि रोबोट घर की सुरक्षा के लिए उपयोग में लाया जाएगा। घर पर चोरी होने की स्थिति में यह भांप लेगा कि घर में मौजूद व्यक्ति बाहरी है। इसी के साथ सुदक्ष ड्रोन ने छात्रों को आधुनिक ड्रोन दिखाए और ड्रोन से जुड़ी जानकारियां छात्रों को दी।

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रुड़की

## रोबोट को देख रोमांचित हुए छात्र

आइआइटी रुड़की में कॉग्निजेंस 2019 का दूसरा दिन, रोबोट, ड्रोन रहे आकर्षण

जागरण संवाददाता, रुड़की: भारतीय प्रौद्योगिकी संस्थान (आइआइटी) रुड़की में चल रहे तकनीकी महोत्सव कॉग्निजेंस 2019 के दूसरे दिन रोबोट, ड्रोन आदि आकर्षण का केंद्र रहे।

दूसरे दिन एलएचसी हाल में प्रदर्शनी लगाई गई। यहां पर आकर्षण का केंद्र इंड्रो रोबोट रहा। इंड्रो रोबोट की खासियत यह है कि यह पास जाने पर हाथ मिलाता है। आरती करता है। इसी के साथ में सभी को नमस्कार करता है। रोबोट की गतिविधियों को देखकर हर कोई आश्चर्यचकित हो गया। रोबोट के निर्माता संतोष हुलवाला ने बताया की रोबोट की लंबाई छह फीट है और इसकी प्रोग्रामिंग पर शोध किया जा रहा है। उन्होंने कहा की आने वाले समय



आइआइटी रुड़की में तकनीकी महोत्सव कॉग्निजेंस में आयोजित कार्यशाला में उपस्थित छात्र।

में रोबोट इंसानों की तरह काम करता नजर आएगा। यदि गलती से रसोई में गैस खुली रह गई तो रोबोट को सेंसरों के जरिये पता चल जाएगा और वो उसे बंद कर देगा। उन्होंने कहा कि रोबोट घर की

सुरक्षा के लिए उपयोग में लाया जाएगा। घर पर चोरी होने की स्थिति में यह भांप लेगा की घर में मौजूद व्यक्ति बाहरी है। इसी के साथ छात्रों को आधुनिक ड्रोन दिखाए और ड्रोन से जुड़ी जानकारियां दी

गई। सुदक्ष टेक्नोलॉजी के फाउंडर केवल ने बताया की ड्रोन कोई खिलाड़ी नहीं है और वो दिन दूर नहीं जब घर का सामान ड्रोन से मंगवाया जाएगा। शनिवार को अन्य कार्यक्रम में मनी रोलर के सहयोग से फिनफेस्ट (वित्तीय उत्सव) का आयोजन हुआ। जिसमें पांच सौ से ज्यादा छात्रों ने पंजीकरण कराया। कुल छात्रों की पंद्रह टीमें बनाई गईं। जिसमें आइआइएम लखनऊ, श्री राम कॉलेज ऑफ कॉमर्स और संत स्टीफन दिल्ली मुख्य रूप से शामिल है। इस प्रतियोगिता में छात्रों को निवेश से संबंधित सवाल दिए गए। इस प्रतियोगिता के विजेता छात्रों को एक लाख का नकद इनाम दिया जाएगा। प्रतियोगिता के नतीजे अंतिम दिन घोषित किए जाएंगे।

# कॉग्निजेंस में रोबोट ने की मानव सरीखी गतिविधियां

फाइन फेस्ट इवेंट में स्टॉक एक्सचेंज के जरिए वित्तीय प्रबंधन की सी

अमर उजाला ब्यूरो

रुड़की। आईआईटी के तकनीकी महोत्सव के दूसरे दिन शनिवार को विभिन्न गतिविधियां हुईं। जहां एक ओर रोबोट ने मानव सरीखे कामकाज कर छात्रों को आकर्षित किया। वहीं, छात्रों ने फाइन फेस्ट नामक इवेंट में स्टॉक एक्सचेंज के जरिए वित्तीय प्रबंधन की बारीकियां सीखीं। इस इवेंट में 500 प्रतिभागियों में 15 टीमों का चयन किया गया है।



आईआईटी में आयोजित कॉग्निजेंस में रोबोट से हाथ मिलाती छात्रा। अमर उजाला

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## दैनिक भास्कर

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जमशेदपुर

जमशेद

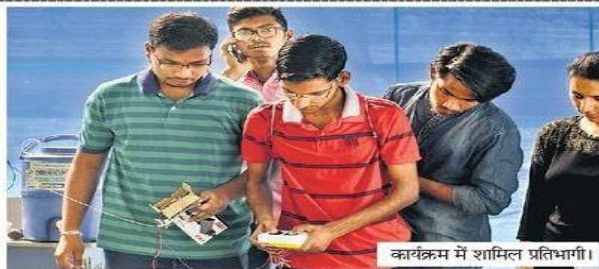
## एनआईटी के ओजस-19 में दूसरे दिन शिवानी शाह की जादूगरी ने विद्यार्थियों को लुभाया मानव रोबोट इंद्रो बना आकर्षण, बात करता है, हंसता, हाथ भी मिलाता है

सिटी रिपोर्टर | जमशेदपुर

नेशनल इन्स्टीट्यूट ऑफ टेक्नोलॉजी (एनआईटी) के टेक्नो मैनेजमेंट फेस्ट ओजस-19 का आकर्षण इस साल मानव रोबोट इन्द्रो है, जो मनुष्य की तरह बोल सकता है, हंस सकता है और हैंडशेक कर सकता है। आर्टिफिशियल इंटेलिजेंस (एआई) प्लेटफॉर्म पर चलने वाले इस रोबोट को संतोष हलावल ने अपने माथ लाए हैं। इन्द्रो ओजस के अंतिम दिन शनिवार को संस्थान में अपना परफॉर्मंस देने वाला है। इस दौरान वह लोगों से बात करेगा और उनके पूछे सवालों का जवाब देगा।

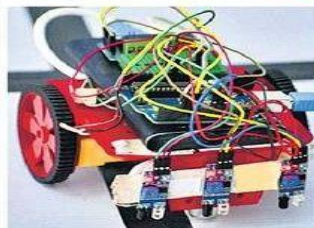
इन्द्रो मानव द्वारा किए जाने वाले 31 एक्शन को कर सकता है। 150 किलोग्राम पेलोड को कैरी करने वाले इन्द्रो में 29 ज्वाइंट्स हैं, जो इसे बेहद लचीला बनाता है। आयोजकों के अनुसार वारिश की वजह से शनिवार को इसका परफॉर्मंस नहीं हो सका, लेकिन यह रोबोट देश भर के विभिन्न इंजीनियरिंग कॉलेज के विद्यार्थियों के लिए आकर्षण का केन्द्र बना हुआ है। उल्लेखनीय है कि जुलाई 2016 में इस रोबोट को निर्माण किया गया था। इन्द्रो के अलावा दूसरे दिन संस्थान रोबोट का बैटल ग्राउंड बना रहा। रोबोटिक्स इवेंट के तहत विभिन्न इंजीनियरिंग कॉलेजों से आए विद्यार्थियों ने अपने रोबोट के बीच जंग कराई। यही नहीं पानी में फ्लोट कर रोबोट ने खुब वाहवाही लुटी।

### डायरेक्टर्स कट इवेंट में विद्यार्थियों द्वारा बनाई 15 शॉर्ट फिल्मों का प्रदर्शन



कार्यक्रम में शामिल प्रतिभागी।

रोबोट के अलावा दूसरे दिन का आकर्षण शिवानी शाह की जादूगरी और टीवीएस मीरिज के कलाकार के जसमीत सिंह का परफॉर्मंस रहा। वारिश की वजह से इनका परफॉर्मंस देर से हुआ। इन्होंने अपनी जादूगरी और पॉलिटिकल शटायर से विद्यार्थियों का मनोरंजन किया। ओजस-19 के पहले दिन वाह्या बुटवाला के परफॉर्मंस को खूब पसंद किया गया। उन्होंने अपनी युथफुल पोपर्टी से भावी इंजीनियरों को लोट पोटा किया। डायरेक्टर्स कट इवेंट में विद्यार्थियों द्वारा बनाई गई 15 शॉर्ट फिल्मों का प्रदर्शन किया गया। अलग-अलग विषयों पर आयोजित इस फिल्म को निर्णायकों ने जज किया। बेस्ट फिल्म को शनिवार को पुरस्कृत किया जाएगा। समारोह में लगभग पांच हजार स्टूडेंट्स शिरकत कर रहे हैं।



ये रोबोट रहे आकर्षण का केन्द्र।

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84 comments

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