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Case Studies

ROBOTICS - MACHINE VISION - AI



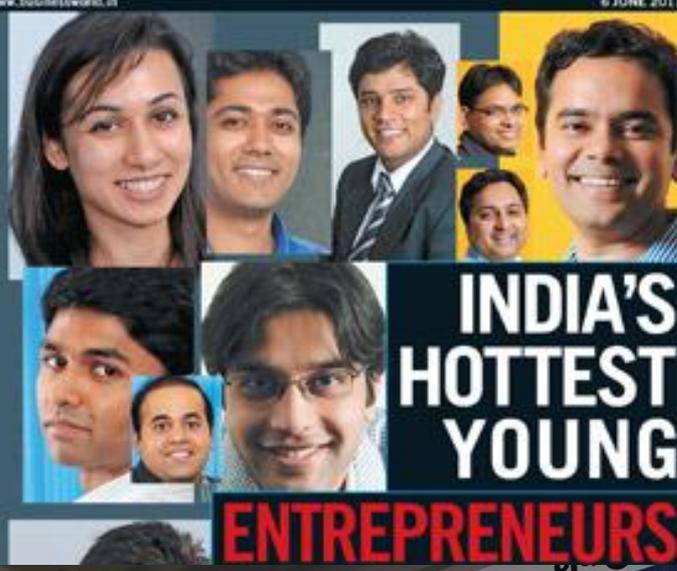
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City firm develops robot that tackles radioactive material

An IIMA-incubated company has developed a robot for Bhabha Atomic Research Centre; it works under water and helps prevent nuclear material from spilling over in case of a disaster like tsunami or quake; if accepted such robots will be installed in N-plants

Pulkit Gaur's (right) firm took two years to develop the robot (above) after winning the order from BARC

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Amdavad robot helps Tata Power cut Rs2.5 cr-a-day loss

5-hours fix by city boys!

[Alok Brahmhatt @alokbrahmhatt](#)



Robot helps take out a wooden log stuck in Tata's power plant in Mundra Govind (left) and Pulkit (right) with Gridbots Stinger, which took out a wooden log from a turbine —Alok Brahmhatt/dna

Ahmedabad: Pulkit Gaur and Govind Godedara, directors of Ahmedabad-based Gridbots, became heroes for a Tata-run power plant in Mundra when they were asked to take a wooden log stuck in a high-pressure pipe.

The wooden block was stuck 10 metres deep in a 300mm diameter high pressure pipe at the Coastal Gujarat Power Limited plant. Steam passes through this pipe and rotates a turbine to generate electricity. The plant was not functioning for some time because of this blockage, causing losses of about Rs2.5 crore to the company everyday.





CASE STUDIES

MATERIAL MANIPULATION IN PIPELINES

Situation: Client power plant went non operational due to wooden logs accidentally thrown deep inside high pressure steam pipelines during their routine maintenance operations. This stoppage was leading to loss of 0.5 Million \$/day. Tata Power called 13 leading global companies to fix this issue which was refused by all.

Product Used: Gridbots Stinger (Pipe Inspection) robot was used with a mounted Robotic Arm to grip and remove the wooden logs stuck there (see image below). The entire work was performed by Gridbots team in less than 48 hours.

5-HOURS FIX BY CITY BOYS!

Amdavad robot helps Tata Power cut Rs2.5 cr-a-day loss

Robot helps take out a wooden log stuck in Tata's power plant in Mundra

Alok Brahmhatt @aalkbrahmhatt

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Being a hardware freak, Pulkit built an advanced robot, especially to function in narrow cavities. This robot became the saviour of the plant managers. "We went inside the pipe and brought the 2.5-foot wooden log out in less than five hours with the help of 'Gridbots Stinger'," said Pulkit.

Gridbots is a robot-making company established in Ahmedabad by Pulkit and Govind.

The power plant contributes two per cent electricity to India. There are five units in the plant with 800MW power generation facility of each unit. Gujarat, Maharashtra and Rajasthan get electricity from the power plant.

The operation took about 72 hours right from studying the blockage to getting the robot modified accordingly. "We were shown a sample of the wooden log which was smaller than the one which was stuck inside the pipe.

Hence we had to modify our robot with stronger grips and return to the plant again," Pulkit said while describing the operation. "It took only about five hours for us to extract the log after we had modified the robot," Govind said.

Meanwhile, no one from Tata Power could not be contacted for comment.

MACHINE PUNCH
The Blockage
There are two lines connecting the turbine, one inlet and an outlet. The outlet needs to have grills to reduce pressure of steam. An engineer had gone down to check grills for blockage and accidentally this wooden log fell into the pipe and got stuck.

The Robot
GridBot Stringer is 12 inches long but took out the 30-inch-long wooden log which was stuck about 10 meters deep

Mission Accomplished
Pulkit operated the robot on remote and Govind looked into operations, resulting in the success of this most difficult task of their career



Govind (left) and Pulkit (right) with Gridbots Stinger, which took out a wooden log from a turbine

—Alok Brahmhatt / dna



INSPECTION AND BLASTING OF COOLING TOWERS

Situation: Client required a robot for their remote blasting and painting operation on metallic surfaces (on chimneys and cooling towers) which are deemed dangerous, manual operations were too time consuming.

Product Used: Gridbots Magnetic Crawler was used to carry remote operation equipments. The crawler can climb vertical Ferro structures for ultrasonic welding, surface quality inspection, defect inspection, or welding / blasting work.



PIPE INSPECTION AND CLEANING

Situation: During the setting up of one of Tata Power plant, cooling tower pipeline was accidentally left with items of various sizes such as welding rods, TMT rods. This was creating issue in optimal working of the cooling tower.

Product Used: Gridbots Dozer Bot (Tight Inspection and Cleaning) robot was used to capture small / big items in the pipeline. Finally 85 items of various sizes were removed to clean the pipeline using the robots.

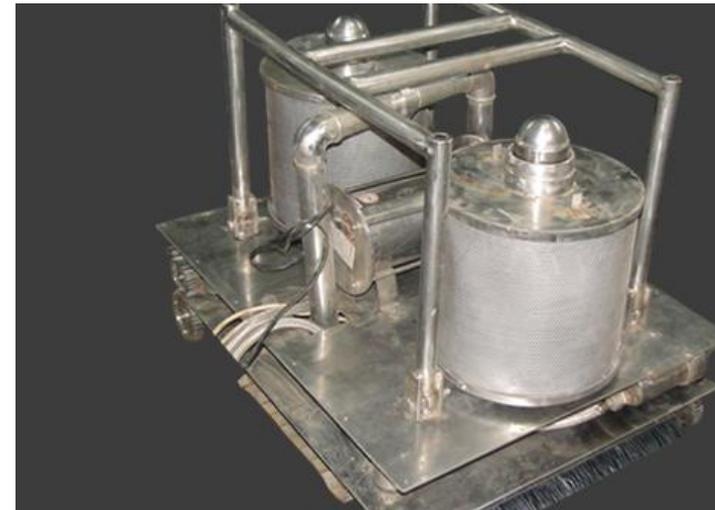




FISSILE POND CLEANING

Situation: Bhabha Atomic Research Center was worried about Fukushima like situation developing in their ponds. Ponds containing nuclear fissile particles dissolved in water. BARC wanted to clean up the ponds nuclear material but no such solution existed in the world.

Product Used: Gridbots developed GAMMA RAD 1 Robot capable of handling underwater nuclear environment (a modified version of Gridbot's Smart Autonomous Underwater Service Robots). The solution allowed BARC to cleanup the ponds of fissile material thereby reducing the likelihood of developing cracks and leakage to surroundings.



MICRO POSITIONING PLATFORMS

Situation: Linking ground antenna with satellite can be really time consuming job. It used to took ISRO 30 days to establish link between the dish antenna and the satellite (a nanometer difference in positioning at the ground level leads to km level difference at satellite level) which led them looking out for this solution.

Product Used: Gridbots Hexapod (6 DOF) positioning platform makes this job easier by reducing time required by 90% to 3 days from 30 days. This was a global tender won by Gridbots based on techno-commercial aspects. Only 3 companies including Gridbots qualified the technical round.





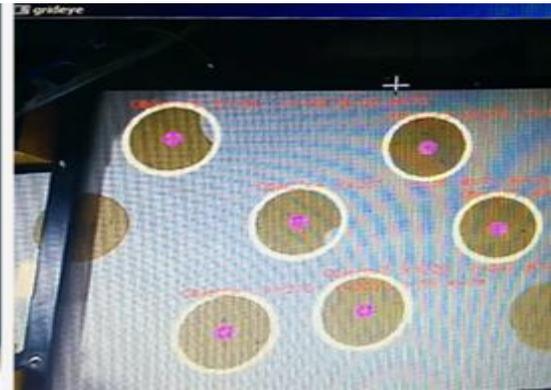
PICK AND PLACE USING SWARM BASED SCARA ROBOTS

Situation: Picking wet “Papadum” (*Mathia*) is time consuming and laborious job. Then inspite of paying best wages out there, lack of labor can be frustrating to business growth as Yash Papad had experienced. It needs 20 people to pick Mathia's from single conveyor. Picking was not easy due to wet nature of mathia leading to loss of production, time and quality.

Product Used: Gridbots “Pick & Pack” Bot – a swarm based SCARA robotic system with integrated Machine Vision (MV) to capture every mathia was used. The group of bots automatically decide which mathia to be picked by which bot. The advance MV system does real time quality inspection based on shape, size, texture and color. Bots place the “Mathia” on a weighting system which is indexed with the weight requirement per pouch.



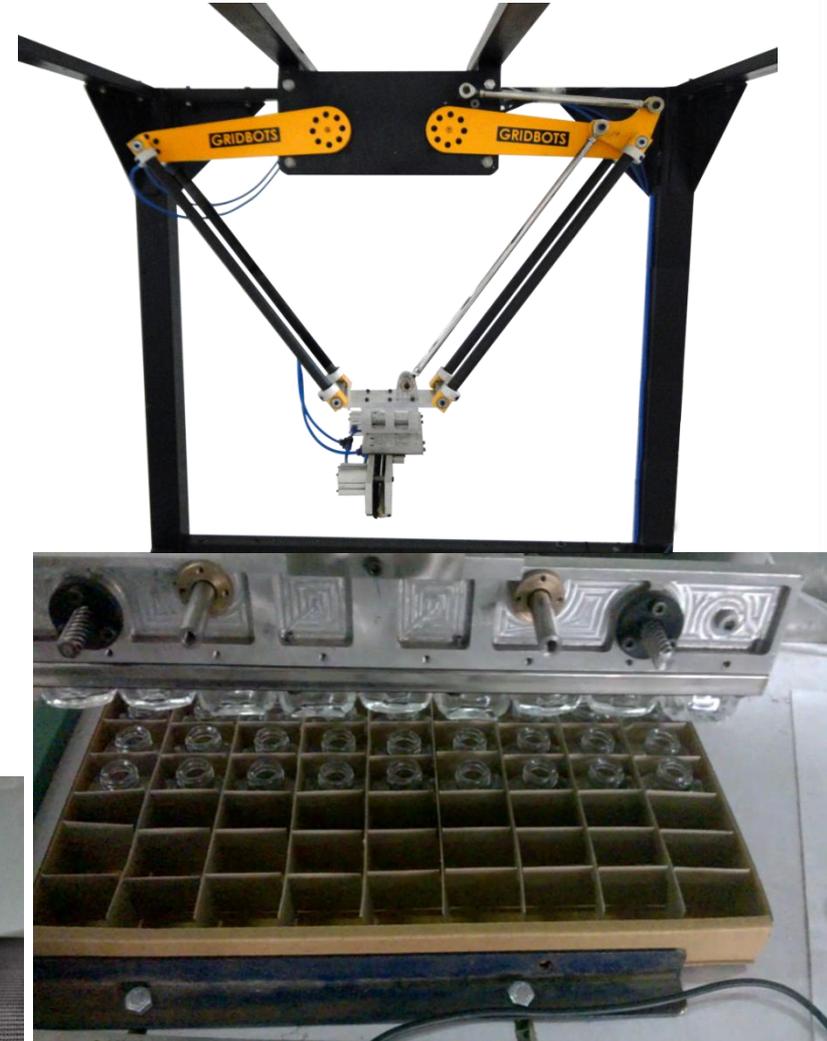
GRIDCAM



END OF LINE AUTOMATION USING DELTA ROBOT

Situation: If picking wet Mathia was not enough, Gridbots had another challenge of “Picking Small Bottles at 350 bottles per minute from conveyors with neck length of 10 mm available for picking” and placing it in cases. The client is using 9-10 employees /day to pick and place glass bottles into the cases / day which is still leading to efficiency and productivity issues.

Complete Solution: Gridbots End of Line Automation Solution consisting of Glass Bottle Counter, Bottle Flipper, Bottle Stacking System, Delta Robot, Parallel Jaw Gripper enabled client to fill trays at 3 times the rate of a human.



SIDE ENTRY INJECTION MOULDING ROBOT

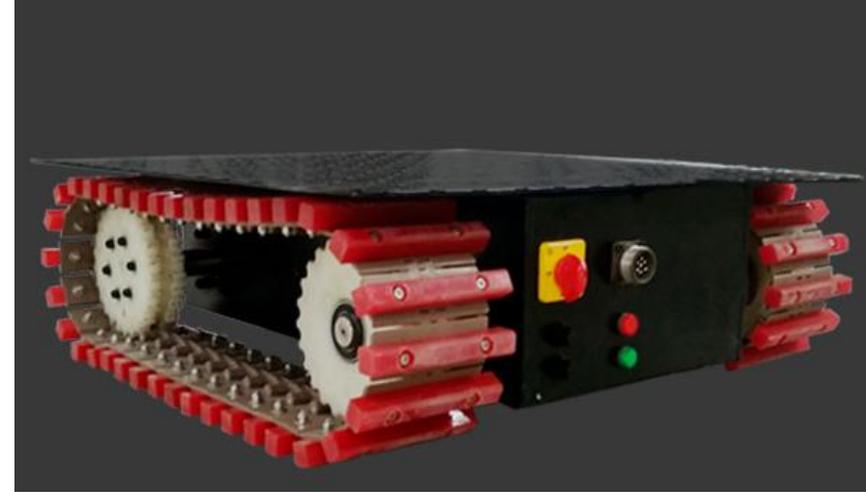
Situation: Client needed a side entry robot for its 1000 tonne injection moulding machine to pick four moulds / pick. Unfortunately all leading injection moulding manufactures refused to provide the solution since the solution was complex. The items needs to be picked inside 2000 mm inside the machine and has to be rotated and placed in specific orientation so that the cutter can remove the runner.

Complete Solution: Gridbots made the solution possible by designing an 11 axis injection moulding robot with 5 KG pickup which can perform the task as per client stringent requirement.



Situation: Managing Large Coal Piles at Ports is very difficult. These heaps need to be covered with Tarpaulin to prevent water inside in rainy seasons. It is generally carried by humans over the piles. Sometimes, there are air pockets just below the surface of coal piles danger of human falling inside and losing life.

Complete Solution: Gridbots g-transporter was used as tarpaulin carrier to carry the tarpaulin over the coal heaps. The robots can be remote controlled by sitting at the ground and therefore minimizes risks of human life.



ASSURING MATERIAL QUALITY

Situation: Estimating quality of mineral is time consuming and laborious job. Each lot needs to be inspected for mineral particles size, aspect ratio, color, transparency and other qualities. Particles sizes are generally in ratio of 10 – 400 microns. Generating 1 inspection report usually takes 2-3 days of clients time.

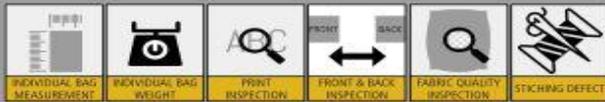
Complete Solution: Gridbots MicroView system does the entire job of inspection and report generation in 5 minutes. It capture 12 samples and provide all the analysis in report format.



POLYBAG QUALITY INSPECTION

FABRI CHECK

ROBOT BASED FULLY AUTOMATIC
BAG INSPECTION SYSTEM



Situation: Gridbots client is one of the key supplier to world largest FMCG Player. He supplies polybags. In spite of 100% manual inspection of bags, sometimes defective bags are passed to the client which results into the line stoppage and quality issues are raised which leads to lot of hassle to client and risk of business loss.

Complete Solution: Gridbots FabriCheck machine which can inspect large items upto 1200 mm by 800 mm in size was used to inspect the bags for dimensional, print and other defects.

INBOUND ITEM VALIDATION

MANUFACTURED & PACKED BY
ROGER INDUSTRIES LIMITED
(A PUBLIC LIMITED COMPANY)
REGISTERED OFFICE
12TH MILESTONE AGRA MATHURA ROAD
ARTONI AGRA PIN 282007 UP

MARKETED BY
LEVI STRAUSS (INDIA) PVT LTD
(A PRIVATE LIMITED COMPANY)
REGISTERED OFFICE
SJR CYBER 22 HOSUR ROAD
ADUGODI BENGALURU PIN 560030 INDIA
PRODUCT SHOE(PU)
Net Quantity 2 N (1 PAIR)
Month & Year of Manufacture and Packing
December-2017
M.R.P. **Rs.2799.00** Inclusive of all taxes
SIZE
LENGTH 26 cm (42)
LOT # 38110-0642
HSN CODE 64041190

LEVI'S®



6 911794 293971
PO NO.4510092928
FOR COMPLAINTS PLEASE CONTACT
CUSTOMER CARE EXECUTIVE
LEVI STRAUSS (INDIA) PVT LTD
(A PRIVATE LIMITED COMPANY)
SJR CYBER 22 HOSUR ROAD
ADUGODI BENGALURU PIN 560030 INDIA
EMAIL feedback@levi.com
Toll Free No 1800 1020 501 (10 AM TO 6 PM)
Monday - Friday

Gridbots PATTMAN
MANUFACTURED/PACKED BY
ROGER INDUSTRIES LIMITED
(PUBLIC LIMITED COMPANY)
REGISTERED OFFICE
12TH MILESTONE AGRA MATHURA ROAD
ARTONI AGRA PIN 282007 UP
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SJR CYBER 22 HOSUR ROAD
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PRODUCT. SHOE (PU)
Net Quantity 2N (1 PAIR)
Month Year of Manufacture and Packing
December 2017
MRP. Rg. 2799.00 inclusive of all taxes
Size
LENGTH 26cm (42)
LOT # 381100642
HSN CODE 64041190
6911794293971
PONO. 4510092928
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EMAIL feedback@levi.com
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Monday Friday

Situation: Gridbots client is one of the India largest e-commerce player. It uses manual labor to verify items coming from its suppliers. Verification is made on the price, size, company name and color of product. Manual inspection used to take lot of time and space.

Complete Solution: Gridbots Text Mining solution was used to inspect relevant field required for validation of items. The system allowed for faster validation and less space requirement which resulted in lot of manpower savings.



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