

K-ROBOT NEWSLETTER

KOREA INSTITUTE FOR ROBOT INDUSTRY ADVANCEMENT

Robotech



Mini ROV System

ROV Kit

www.rovotech.com

Isan Solution



Code Star

Coblo

- Coding Training Robots, Code Star & Coblo-

www.isans.co.kr

2nd 2016 R-BIZ Challenge



Participating teams in this competition will announce marketing strategy and business model for intelligent service robot from 14-16 October and the winner will be screened based on the creativity of idea, logical soundness, practical feasibility and presentation performance. Professionals in robot, management and marketing will focus on the practical feasibility of ideas that have not be commercialized.

Participants to Promotion Center of 2016 Robot Distribution Business and Robot Information



Korea Robot Industry Promotion Institute will be operating the robot promotion center during the 'Roboworld 2016'. This is aimed for promoting the 'Robot Pilot Program for Market Creation' of the institute internationally and domestically.

www.robotworld.or.kr

Status of Korea Exhibition [2016 ROBOTWORLD]



Please inquire the following contact point if you have any question on robot or robot company.

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Robotech

Robotech, a professional developer of underwater robot, is introducing its underwater robots including mini ROV system and ROV kit at 'Roboworld 2016'. ROV (Remotely Operated Vehicle) is a robot capable of various tasks such as underwater investigation, sampling and maintenance of underwater structures.

Mini ROV System

Mini ROV, recently developed by Robotech, is an underwater robot with cutting edge functions for conducting tasks underwater as deep as 200 m, and is expected to replace imported robots. Mini ROV comes in maximum depths of 100 m and 200 m.

Mini ROV for 100 m underwater is a small robot with dimensions 46 cm, 34 cm and 26 cm in width, breadth and height weighing 11 kg and having payload of 3 kg. It operates up to 100 m underwater without big issue, and has two horizontal and two vertical thrusters. It is capable of 1080p HD video recording, and with two LED lamps of 1,500 lumens, it is capable of identifying objects deep underwater by turning the lamps on. Mini ROV operable up to 200 m underwater can additionally install devices such as CTD, grabbers and scanning sonar. It weighs 30 kg and has payload of 3 kg.

Mini ROV System



Specifications

Dimensions	Width/Breadth/Height 46x34x26 cm
Weight	11 kg (In air)
Payload	3kg
Assembly, battery powered	

Specifications

Operable Depth	Max 100m
Thruster	4 horizontal, 2 vertical
Thrusting power	14 kgf forward, 9 kgf upward
Power supply	10 Ah battery (1~4 hours)
Camera	1080p HD video Camera tilting angle (vertical): 180° (±90°)
Light	LED 2 x 1500 lumens
Tether	Diameter 7.6mm Breaking Strength 160kgf
Thrust	Forward Bollard Thrust 14kgf Vertical Bollard Thrust 9kgf Lateral Bollard Thrust 14kgf

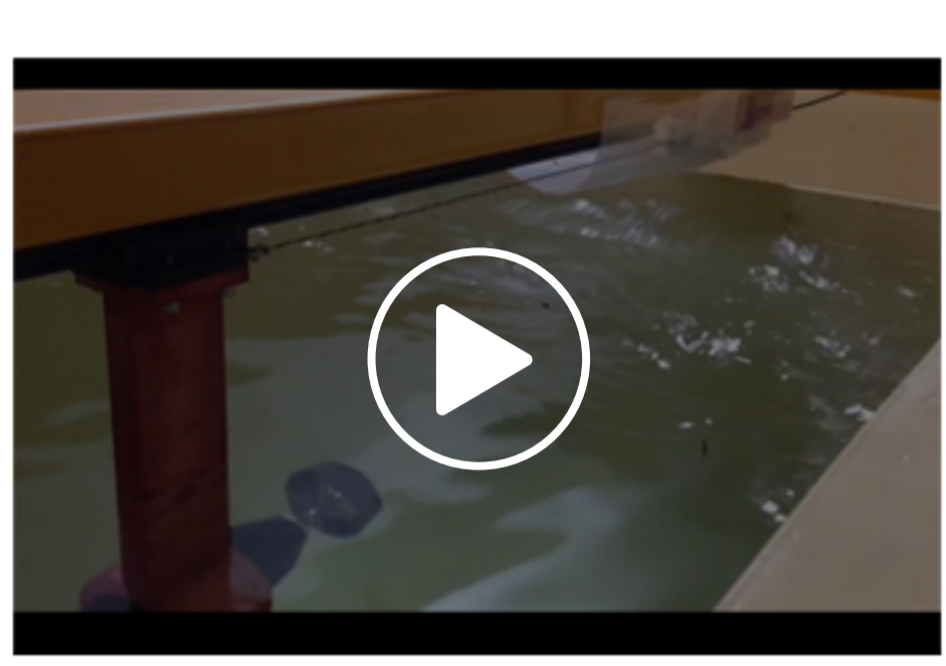
www.rovotech.com

Mini ROV can be used in tasks such as underwater creature and environment investigation, underwater structure investigation in ports/coasts, underwater search and rescue, investigation of submerged vessels and ship bottom investigation. KEPCO conducted verification test for underwater cable investigation by using Mini ROV.

In the future, Robotech is planning to expand the domestic ROV market by replacing imported goods with Mini ROV System and advance into overseas markets after further improving the products. Most of the ROVs currently distributed in Korea are imported from US and Canada for special uses at public institutions in maritime safety and marine research institutions.



BLUE ROV



Thrust Power Test

ROV Kit

Robotech also launched ROV kit. This ROV kit comes in basic model and advanced model. The basic ROV kit or the 'Rovotter I' is equipped with two horizontal and one vertical thrusters and is made from PVC pipe frame. The cable length connected to the robot is as long as 10 m, and a 12V DC battery is built-in. The Advanced ROV kit or the 'Rovotter II' has additional features to basic model such as the robot grabbers, underwater camera and TV monitor and is capable of holding objects and recording video footage underwater.

ROV kit System

ROV kit – Standard Type

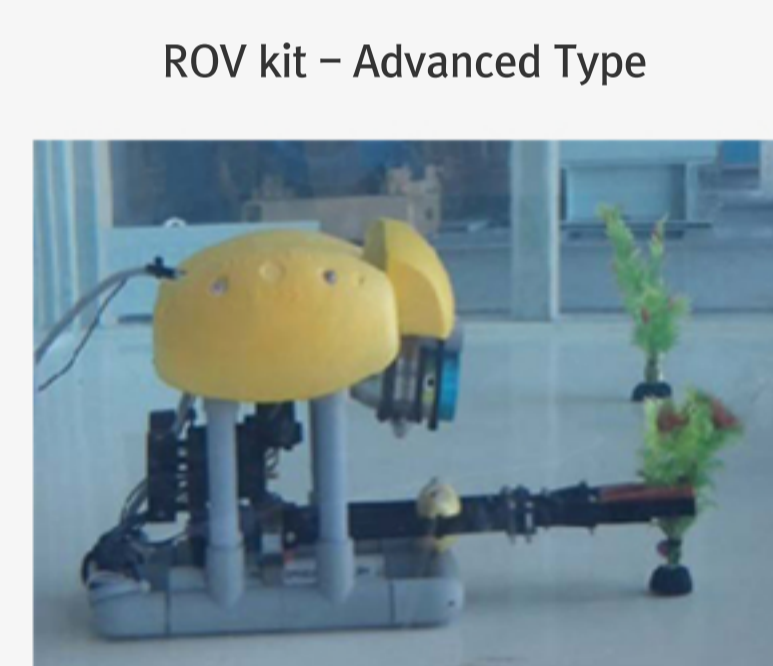


Model : Rovotter I

Components

Thruster	Two horizontal, one vertical
Buoyancy Foam	
Frame	PVC pipe
control Box	Thruster Control
Tether	10m
Battery	12VDC Battery, Charger

ROV kit – Advanced Type



Model : Rovotter II

Additional Components

Grabber	
Buoyancy Foam	Underwater Camera
Frame	TV Monitor

Mini ROV System

ROV



Surface Control Unit

Tether Cable



ROV

ROV utilization

Depth (Underwater)	Max 200m
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Utilization	Underwater creature/environment investigation Port/coastal underwater structure investigation Underwater search and rescue, submerged vessel investigation under vessel investigation
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Additional Devices	CTD (Temperature and salinity measuring sensor) Grabber, scanning sonar, etc.
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Features

Components	Surface control unit Tether ROV
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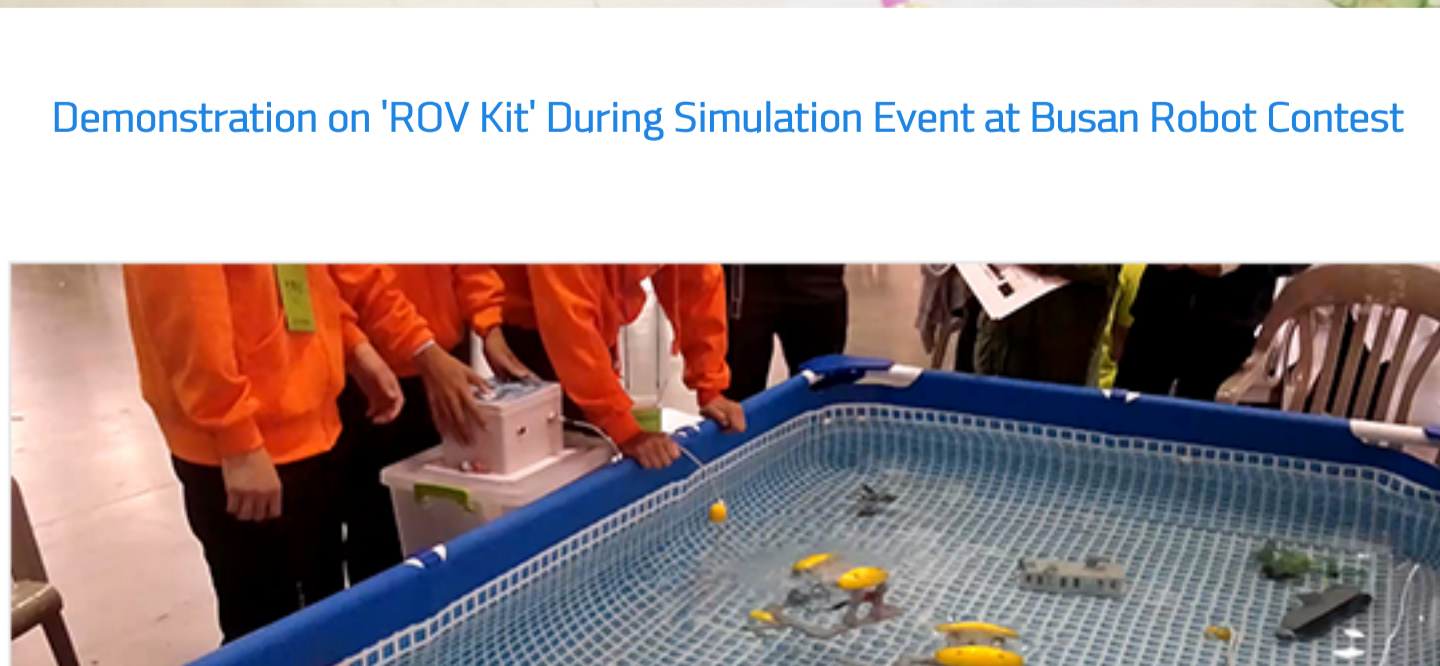
ROV components	HD camera (1), LED lights (2), thrusters (3)
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ROV (unmanned submarine)	Dimensions: Width/Breadth/Height 62x41x54 cm Weight: 30 kg (In air) Payload: 3 kg Power supply: Input 220 VAC / ROV power 300 VDC Communication: RS-485 serial communication Auto function: Auto depth, auto heading
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ROV kit developed by Robotech was supplied for practical education for underwater robot operation at Industrial Diving Department in Gangneung Campus of Korea Polytechnics, and has been supplied for test operation programs for ROV kit at Busan Robot Contest, National Yeongdeok Youth Maritime Environmental Experience Center and Korean Youth Fair.



Demonstration on 'ROV Kit' During Simulation Event at Busan Robot Contest



Robotech was established in 2013 as a maritime venture company specializing in development, manufacturing and operation of ROVs for underwater investigation. It has developed and is supplying 100 m and 200 m mini unmanned submarines and ROV kits. It has entered distribution contract with Blue Robotics in August this year for supply of products. Since establishment in 2013, it has grown into a company that develops educational ROV kits as well as operation of ROVs. Since relocation of head office to maritime robot center for Korea Institute of Industrial Technology in Busan from Daejeon August last year, it has kick started development and commercialization of ROVs.

Isan Solution : Coding Training Robots, Code Star & Coblo

Isan Solution is introducing its creative coding education robots 'Code Star' and 'Coblo' at 'Roboworld 2016'. Since software education focused on creativity will become one of the mandatory subjects from 2018, many textbooks are being launched. This product was developed to help students to learn software in fun way.

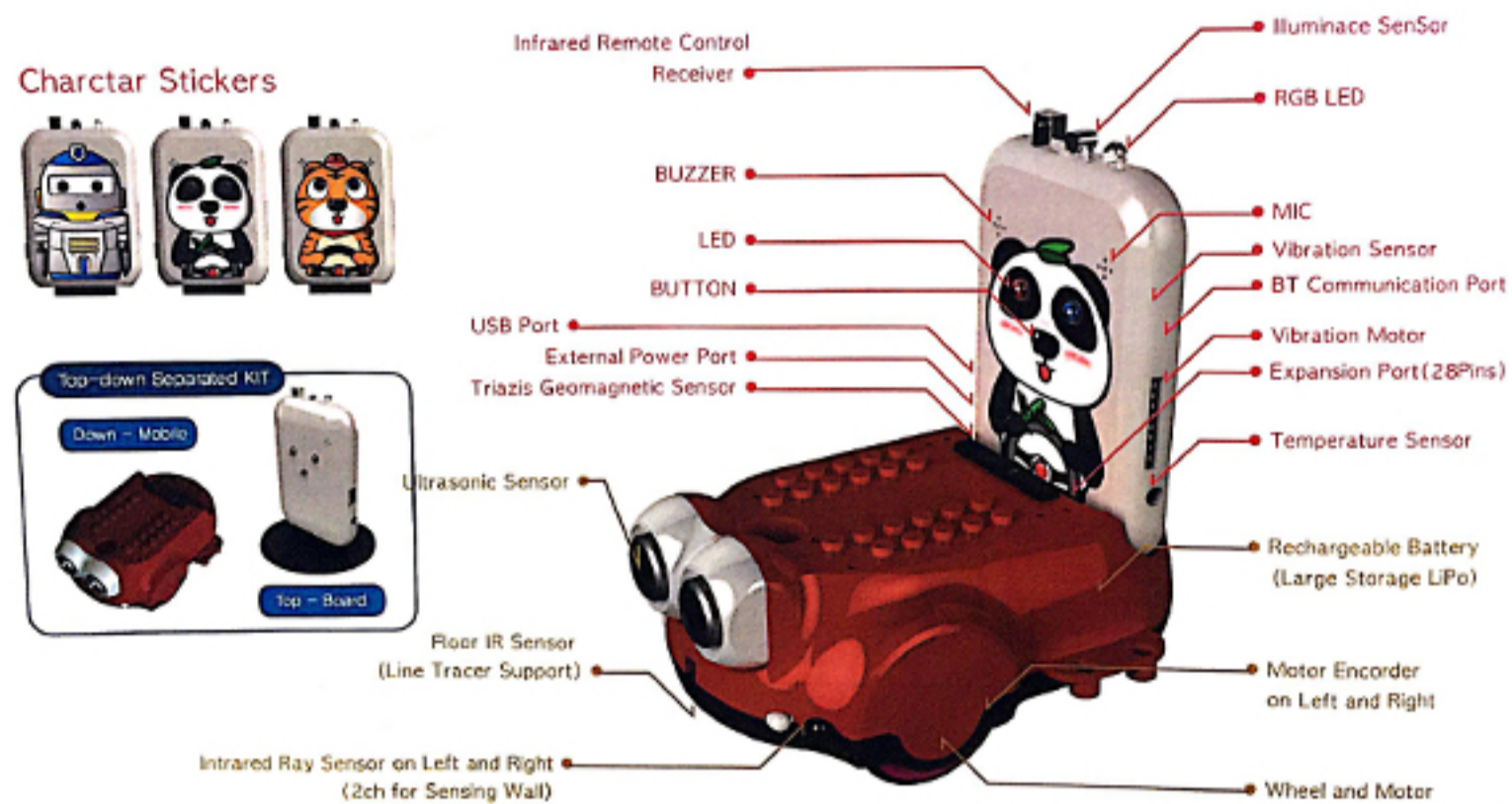
Coding Education Robot for Elementary School Students, **Code Star**



'Code Star', an educational robot for elementary school students, is a preassembled robot without the concern of wasting time for assembly and loss of parts and was developed for students to focus on coding education itself. In combination with Scratch, Sketch and Arduino, it can be used in coding education in most age groups, and assists in various robot designs by using Lego blocks. 'Code Star' features most of functions necessary in software education at cheap price for light pocketed students. It is receiving satisfactory remarks from teachers in coding education.

CODE STAR ROBOT SPECIFICATION

CodeStar support optimal teaching references and workshop for universities, reserch institutions, educational institutions, afterschool and so on.



Coding Education Robot for Preschoolers, **Coblo**

'Coblo', a coding education robot for preschoolers, was developed targeting preschoolers of 5-7 years of age in kindergartens, day care centers and arts academies that allows coding education without the need for a computer. It has the advantage of coding education while playing with non-toxic block toys. Preschoolers who cannot use computers can use wooden blocks and coding boards to learn the principles of coding and get accustomed by moving the robot.

When shaped blocks are laid onto the board in sequence, the robot moves in this sequence. This robot was designed to induce preschoolers to repeatedly play around and learn coding by recognizing that robot moves according to their inten-

Coblo Introduction

- **Product**
Coblo (Coding Block Robot)
- **Product Description**
Coblo is a robot product for educating coding to preschoolers to get accustomed to coding.
 - Place coding blocks on the coding board in a sequence to make the robot move in this sequence.
 - Preschoolers can learn to move robots and conduct various tasks through coding by repeatedly playing games
 - Learn to create various play activities and easily solve difficult problems by applying coding blocks

- **Product features**
- Not Computing**
(Coding education without the need of a computer)
- Tangible**
(Block type textbooks touched by played with by children)
- Safety**
(Eco-friendly education product using premium wood)
- Creativity**
(Enhanced creativity of children)

Isan Solution, succeeded in localizing coding education products for preschoolers that were only available in kindergartens in advanced countries such as UK and US, has developed the products from the idea that products of foreign companies only support dozens of blocks. The company explains that its products have global competitive advantage as they can create upto thousands of coding blocks based on its sensing blocks developed from independent patented technology.

This year, Isan Solution is planning to focus on distributing Code Star and Coblo. For this, Isan Solution has entered partnership with Sundoo Electronics to kick start supply of Code Star to schools. It entered product purchase contract for 8,500 robots in which the coding robot 'Code Star' will be applied to after-school classes of elementary schools consigned to Sundoo Electronics and its nationwide franchises. It plans to promote product distribution before the semester for 2017 begins.

Also, Isan Solution is planning to commercialize robot coding education system for preschoolers and test bed establishment projects in partnership with kindergartens this year. Isan Solution is planning to focus on promotion of creation of market and distribution of robot coding education for preschoolers with the support from Korea Robot Industry Promotion Institute. For early software education, it believes in the importance of distribution of domestic coding education robot and basis for learning.

Isan solution is planning to distribute Coblo targeting 9,000 kindergartens, 15,000 day care centers and 8,000 art academies in the first phase. First, demonstration for robot coding education will be implemented in three kindergartens in the metropolitan area and then promote robot coding education in partnership with Korea Kindergarten Union. Then, it plans to target domestic B2C markets such as preschooler education, toy seller websites and home-school materials. Furthermore, it plans to advance into the Chinese market and expand regions in partnership with preschooler education business partners in China. It plans to promote robot coding education targeting 110,000 kindergartens nationwide in China in partnership with local kindergartens in Beijing and Shanghai.



Demonstrative Education of 'Coblo' at Kindergarten (Uju Kindergarten)

Isan Solution is recruiting franchises that will supply its products nationwide and lecturers who will take in charge of education after completing its line-up of robot coding education products. It plans to hold product demonstration with 100 franchise owners of preschooler education businesses from all over the country at KINTEX conference room on 12th, the first day of opening the 'Roboworld 2016'.

Robotech Isan Solution

2nd 2016 R-BIZ Challenge

Participants to Promotion Center of 2016 Robot Distribution Business and Robot Information

2nd 2016 Robot Business Idea Competition R-BIZ (Robot-Business, Idea, Zest) Challenge

Application for Entry

Developers Wed 20 Apr ~ Tues 31 May 2016

Marketers Wed 01 Sept ~ Fri 30 Sept 2016

2nd 2016 R-BIZ Challenge

The 2nd R-BIZ Challenge will be held in Isan KINTEX from 14 to 16 October hosted by Ministry of Trade, Industry and Energy, and held by Korea Robot Industry Promotion Institute and Institute of Control, Robotics and Systems. R-BIZ Challenge is a robot competition aimed at discovering business ideas and marketing strategies by using robot parts and products developed in Korea. From this, it aims to promote development of robot industry and cultivate talented personnel in robot. This year, the competition will be divided into 'creation or mission in competition by using robot products or services' and 'robot and service business model and marketing strategy presentations'.

DST robot multi-mission challenge and Saeon unmanned vehicle autonomous driving mission challenge will be held in creation or mission in competition using robot products or services, and nuri robot rocketing competition and duro rocketing competition will be held in robot and service business model and marketing strategy presentations.

Citation by Minister of Trade, Industry and Energy, director of Korea Robot Industry Promotion Institute, president of Institute of Control, Robotics and systems, director of Korean Intellectual Property Office and CEO of company will be given to each winner of competition, and the presidential citation will be given to the winner of grand prize. High school students and higher can participate in DST robot multi-mission challenge and Saeon unmanned vehicle autonomous driving challenge and there is no restriction in participants to nuri robot rocketing competition and duro rocketing competition.

Above all, the spirits are high for the Saeon unmanned vehicle autonomous driving mission challenge and duro rocketing competition with the increasing excitement over autonomous driving vehicles and intelligent service robots.

Saeon - Unmanned Vehicle Autonomous Driving Mission Challenge



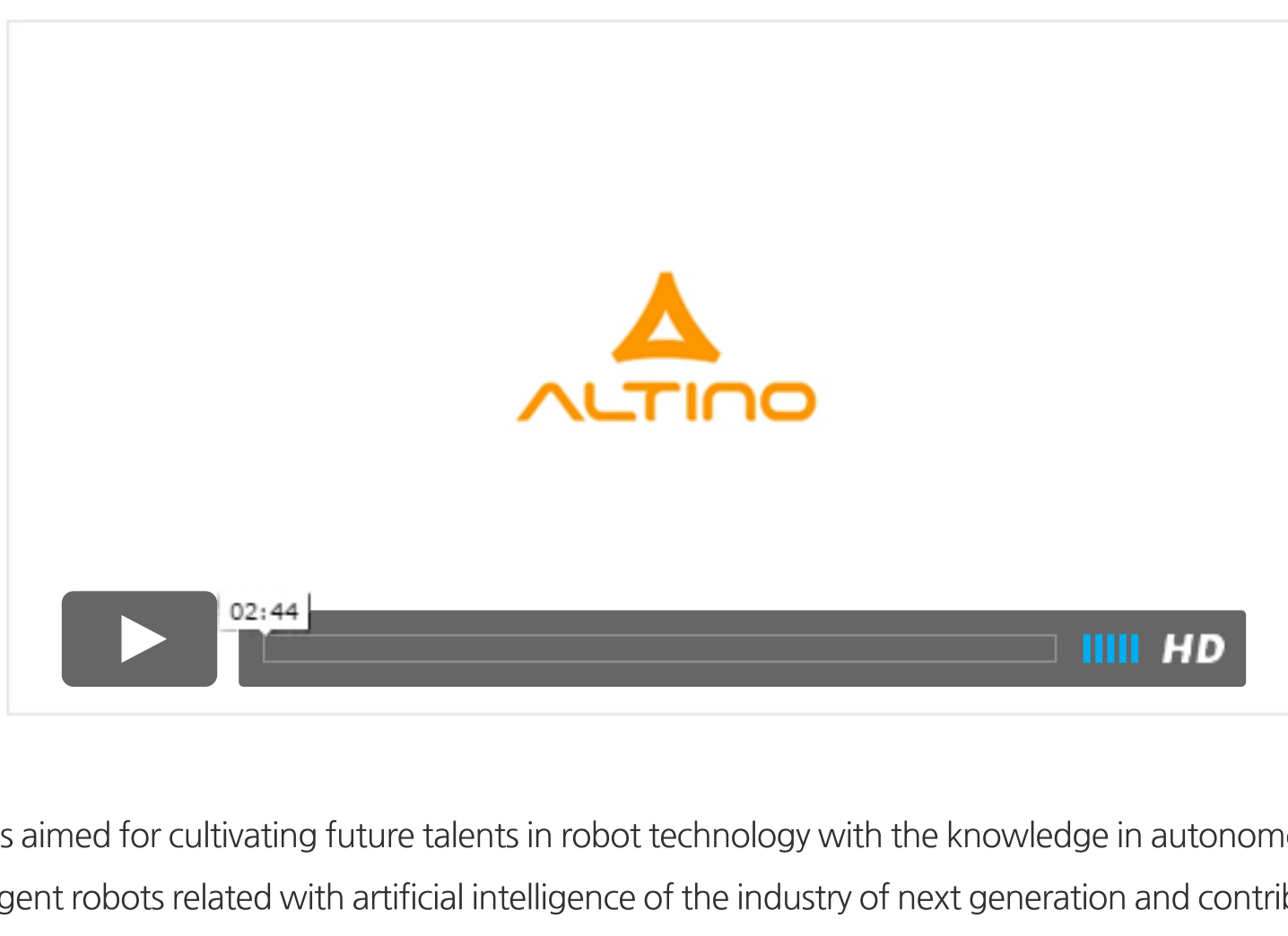
Saeon unmanned vehicle autonomous driving mission challenge aims to conduct the given autonomous driving missions (straight road, curves, bumpy road, traffic lights, unforeseen incidents, parking, etc.) and announce the developed algorithm. Altino, developed by Saeon is a steering mobile robot platform with 10 or more sensors built-in. This platform has sensors and device structure in perfect harmony for implementing intelligent functions in unmanned vehicles.

Altino is capable of implementing autonomous driving and various mobile algorithms through dispersed processing of sensor network and additional installation of various sensors and automatic control mechanisms. It comprehends vehicle driving algorithm and multi-electron transmission algorithm. It can be operated by a remote control, capable of measuring temperature of robot and is equipped with a compass for identifying the current location. Altino is equipped with a gyro, compass, 3-axes accelerator, 7 sensors including obstacle sensor and various display devices for flexibility in coding education. Due to the capability to learn robot mechanism using a separate disassembly/assembly model, it is popular among students and general population.

Specification

Dimensions	97 mm x 180 mm x 64 mm (L x W x H) / Ground clearance: 12 mm
Material	Polycarbonate
Processor	Atmega 128, Atmega 88 Dual Processor
Drive Motor	DC Geared Motor (250 rpm / 30:1 / 3.5-8 VDC)
Steering Control Motor	DC Geared Motor / 220 m / 88 rpm / 2.5-6 VDC
Wheel	4 forward wheel driving structure
Speed	Max. 50 cm/s
Valid load	Over 2 kg
Sensors	Obstacle Detection Infrared Sensors: 6 Steering Control Sensor: 1 Terrestrial Magnetism Sensor: 1 Acceleration Sensor(3 axes): 1 Temperature Sensor: 1 Illumination Sensor: 1 IR Receiver: 1
Display	Dot Matrix 8x8, Status Indication Lamp: 13 types, Buzzer: 1
Communication	UART (RS 232) Bluetooth (2.4 GHz)
Battery	Li-ion cell, 7.2 V 2600 mAh
Charger	(Input) 100-240 VAC / 47-63 Hz, (Output) 8.4 V 1200 mAh

Equipment

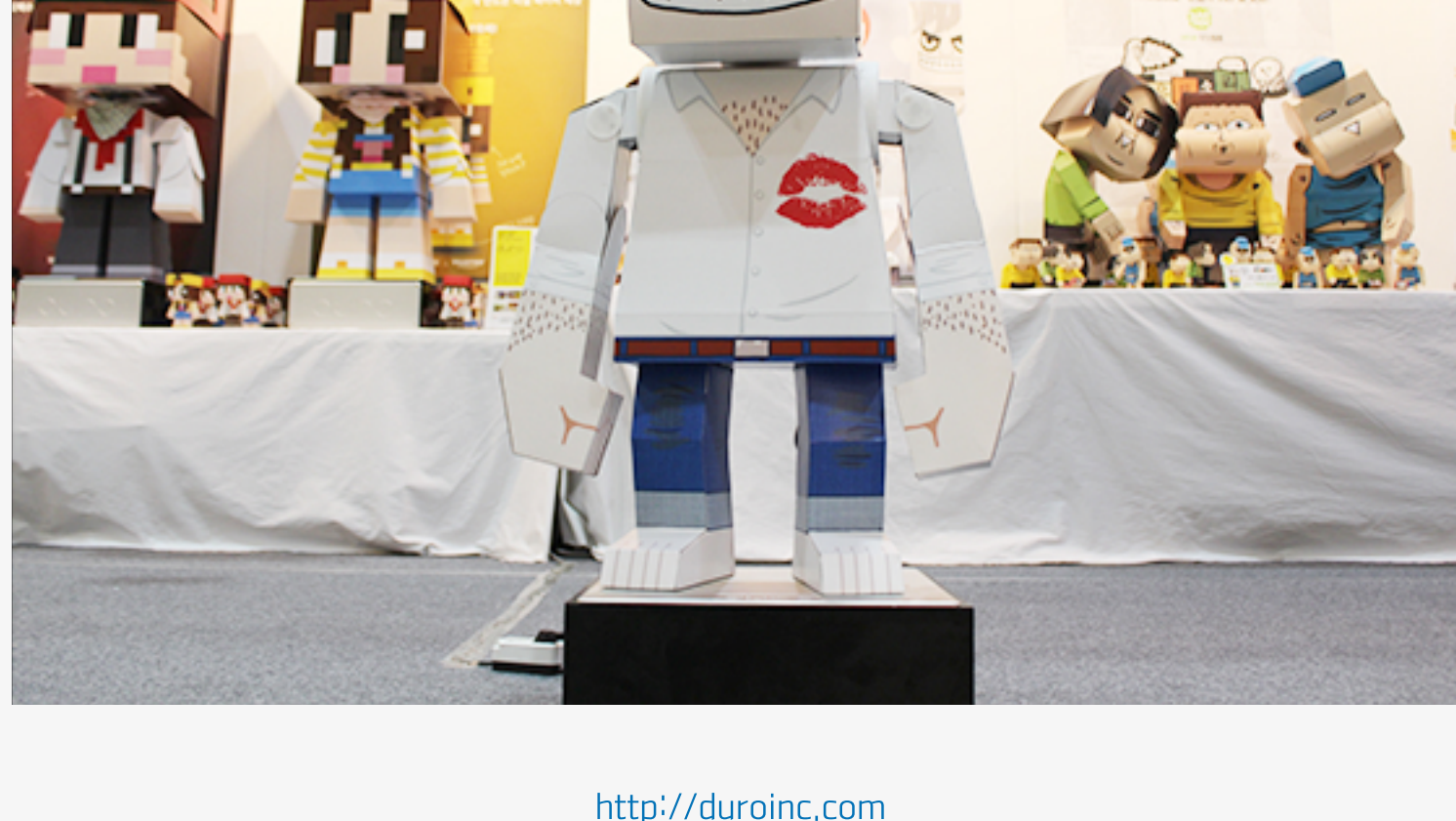


this challenge is aimed for cultivating future talents in robot technology with the knowledge in autonomous driving technology in intelligent robots related with artificial intelligence of the industry of next generation and contribute to industrial development by improving development capacity in unmanned algorithm of autonomous driving in unmanned taxi and vehicles as well as autonomous driving in all industries.

In the main competition held from 14-16 October, the final winner will be selected from the completeness of self-deformation in the step 1 and selective mission in step 2. The candidates will be screened based on the level of understanding in robot system, utilization of algorithms and creativity of algorithms.

Saeon is planning to export the platform in this challenge to Indonesia. When it entered the 'Robot Integrated Festival' in Daejeon last year, it promised to jointly hold the platform for 'unmanned national defense robot competition' with National University Jakarta in Indonesia and recently exchanged the investment letter of intent.

Duro - Rocketing Competition



<http://duroinc.com>

In another competition that draws attention, Duro Rocketing Competition (short for robot products, services, marketing, strategy and mission), the marketing strategy and creative business model for effectively promoting artistic character intelligent service robot developed by Duro and identifying the applicable market need to be announced. Artistic character intelligent service robot has a popular character appearance, provides renewal of character skin and voice service, and supports location based portable mobile base.

Intelligent Character Service Robot Professional Developer, Duro

duro
DURABLE ROBOTICS FOR SMART LIFE

- Custom-made character robots
- Famous character designs
- Product sales and short term lease
- Robots for exhibition and promotion

Peco toy character 'Valkyrie'

1.0M in actual size

Product features

- Intelligent character robot with character skin
- Supports character voice and gesture
- Portable mobile base (location based)
- Integrated management

Production Process

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graph LR
    Estimation --> Delivery[Delivery contract]
    Delivery --> Design
    Design --> Building
    Building --> Production
    Production --> Testing[Testing prototype]
    Testing --> Delivery
    
```

Displayed in robot theme park Product promotion at store entrance

Airport Museum and exhibition center

Product Use

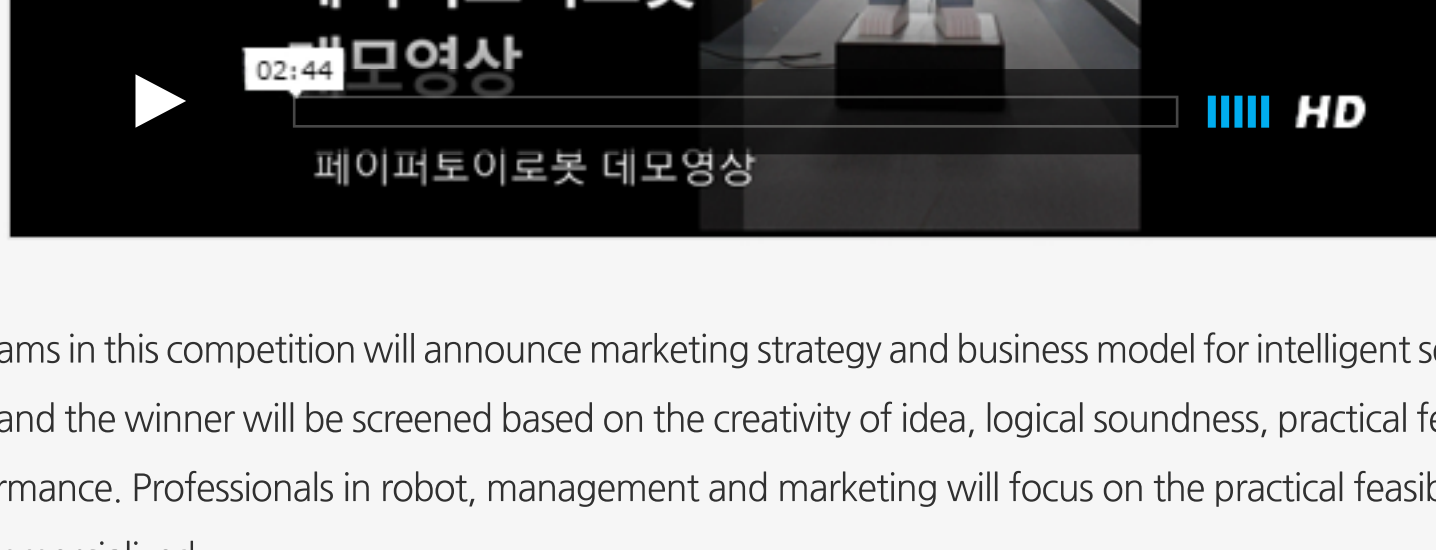
- Promotion of characters and content using robot
- Entertainment exhibition and performance at robot theme park
- Promotion of store product
- Museum/exhibition center/airport guidance service

Duro is a professional developer that converges **CONTENT and ROBOT.**

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TEL: 02-866-0701

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Korea Robot Industry Promotion Institute has invested budget of KRW 109 billion for the past six years through Robot Pilot Program for Market Creation in total 107 tasks and took sales performance of over KRW 228.2 billion. This year, total 21 tasks (KRW 8.24 billion) were selected in the Robot Pilot Program. The tasks include 'electrical facility diagnosis business using autonomous drone robots' by KEPCO, 'drone-based logistics shipping system establishment project' by ETRI, 'market-oriented robot parts distribution business' by Bucheon industrial promotion foundation, 'invigoration and promotion of software education using robot' by Korea Education and Research Information Service, 'demonstration service for commercialization of ecology for smart home service robot' by IPL, 'improvement of function and promotion strategy for wet mop cleaning robot' by Fine Robotics, and 'intelligent drone edutainment content promotion project in America and overseas' by Robo Link.

Above all, the tasks promoted by IPL, Fine Robotics and Robo Link are drawing attention from the aspect of application of robots in real life. The below will illustrate the major agendas.

2016 Robot Distribution Business and Robot Information

Zoning	Classification of Supportive Business	Company	Task
Training	Training	M-Tech	Modulo Series
		KERIS	SW Training Robot
Industrial Zone	Agriculture	Jeonbuk Techno Park	Agricultural Pest Prevention Drone
		Jeonbuk Techno Park (Down)	TMR Feeder Robot
		Helper Robo Tech	Paper Pot Seedling Robot
	Logistics	Core Bell	Unmanned Autonomous Driving Returning Vehicle
		Now	Steel Structure PAUT NDT Robot
	Industry	Dream CNG	Road Surface Cleaning Robot
		KITECH	Wearable Robot for Firefighters
		DMBH	SCARA Robot for Training
		Low How	Unmanned Excavator Control System
		HSG	BLDC Motor and 2 more
Parts	MTSE	3-Axes Delta Robot	
	"Senes Technology (Parts)"	Decelerator	
	"Maro Robot Tech(Parts)"	Smart Logistics Robot	
Stage	Culture	"Roboto(Parts)"	Smart Actuator Delta Robot"
		KOTPA	"Deongdeokung Hanmadang (Korean Fan Dance, Taekwondo, etc.)"
		IPL	Smart Home Service Robot
Living	Living & Smart Home	Fine Robotics	Wet Mop Cleaning Robot
		Baraem	Smart Home Service Robot
		Robo Link	Intelligent Drone
	Culture	Iro	Aquarium Fish Robot
		SG Mechatronics * Participating institutions of National Rehabilitation Center	Angelex (Walking Assistance Robot)
	Medical	Robo Care / Suwon-si	Brain Health Robot for Mild Cognitive Impairment
		The Ministry of Health and Welfare and the National Rehabilitation Center	Undefined

2016 Robot Distribution Business and Robot Information.xls

IPL - IJINI

IPL: IPL is promoting smart home robot platform business for providing robot platform service based on cloud system through integration of IoT, big data and AI technology.

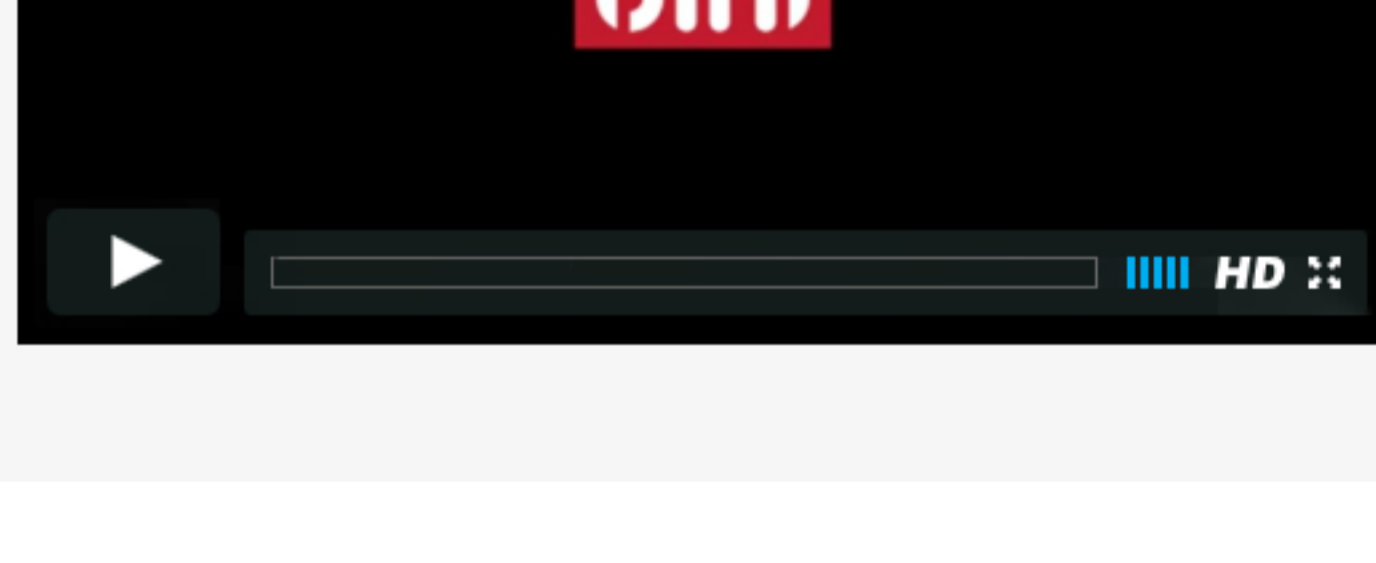
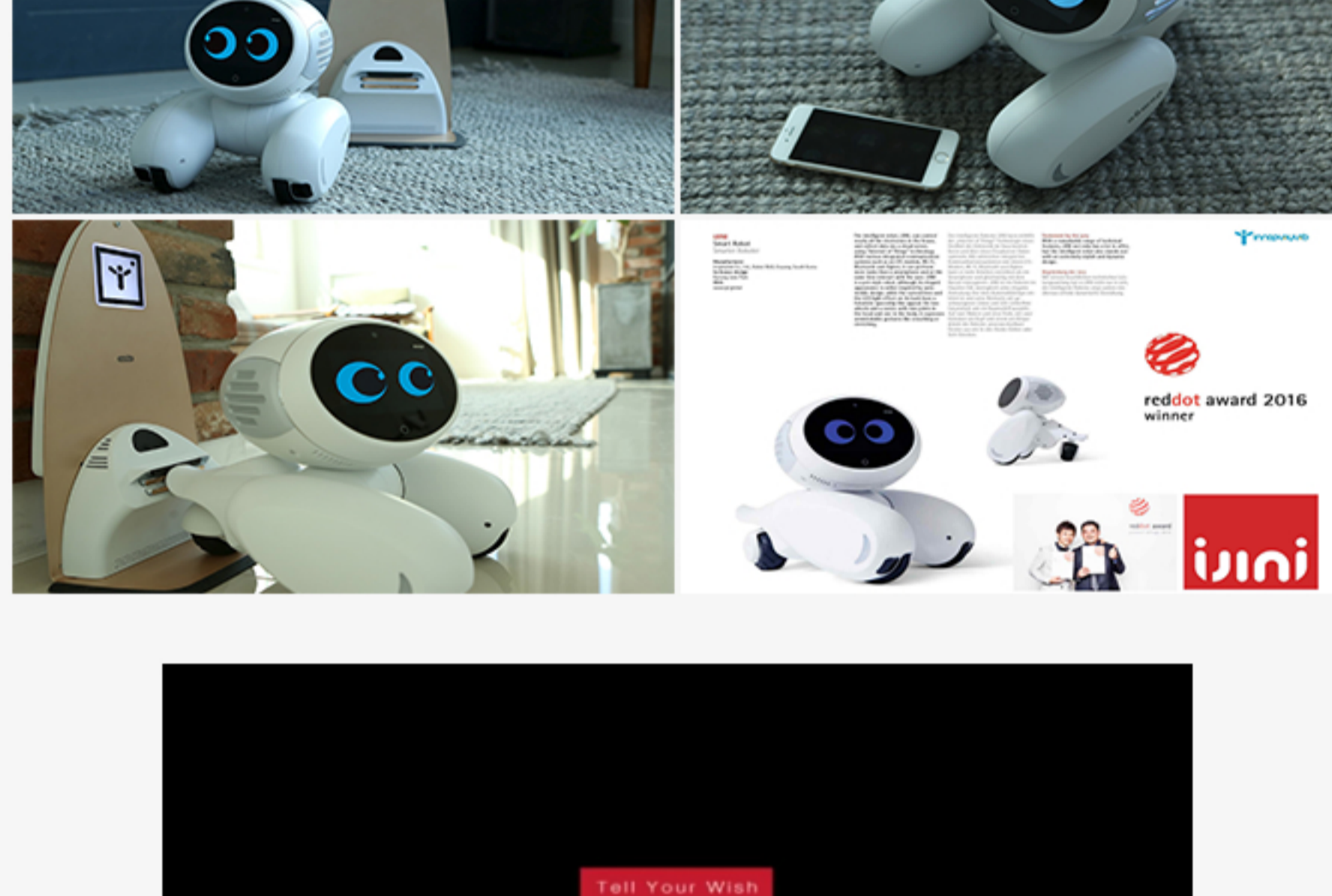
IPL has developed and is promoting distribution of home communication robot, 'IJINI'. IJINI can walk around the house.



Users can select various menus on touch screen and control its movements on smart phone. It can express various emotions including love and happiness by moving its pupils on its face. It is capable of taking photos from its 5 megapixel camera and send warning message to family in the event of intrusion. It has calling function and when it goes out of battery, it can automatically charge itself by moving to the charging station.

IPL has big expectations in the Chinese market. For this, it has established the marketing channel in China in partnership with 'Robo', a robot start-up in China. In the future, it plans to enter B2C market and actively engage in B2B market strategy in partnership with mobile service providers, household appliance manufacturers and solutions developers. IPL is planning on exporting robots to China, Singapore and Thailand.

IPL is a robot start-up established in March 2014 by former employees of KT. Currently, around 40 developers are preparing for launching global service. Since establishment, it has won '2016 Reddot Design Award Best winner of the industrial', overseas series A investment (USD 220 million), 'First Penguin Excellent Company' and '2015 Next Startup Award'.



Fine Robotics - i'sense

Fine Robotics: Fine Robotics has developed 'i'sense', a wet mop cleaning robot, and is planning to supply domestically and internationally.

i'sense is a practical cleaning robot that rotates the main body, water tank and mop to move and clean at the same time. It rotates at a fast rate and automatically supplies water from the built-in water tank to prevent the mop from drying out until cleaning is over.

With a built-in distance sensor, it can detect the distance from an obstacle for reinforced safety by preventing crash while cleaning. The compact size allows cleaning even the narrow spaces such as under the bed or chair, and eco-friendly lithium iron phosphate battery without toxic substances such as heavy metals features consumer safety and efficiency.

For optimum wet mopping effect, polyester multi-filament yarn mop pad for excellent dust collection ability and microfiber mop pad for excellent wet wiping performance are provided. The mop pads have been specially designed in greater diameter than the holder for effective cleaning of corners and walls.

Fine Robotics is planning to establish the test bed through market-oriented robot distribution business and engage in overseas market strategy after gaining certifications in Europe and North America.

In domestic market, it plans to promote supply through home shopping channels and secure distribution channels in Electro Land and Homeplus. Fine Robotics is a robot start-up composed of experts in robots and household appliances with experience longer than 10 years.

Parts	Product Specifications																				
	<table border="1"> <thead> <tr> <th colspan="2">Cleaner</th> </tr> </thead> <tbody> <tr> <td>Product Name (Model)</td> <td>i'sense dust carebot (HC200)</td> </tr> <tr> <td>Dimensions</td> <td>260 mm diameter x 126 mm height (including water tank)</td> </tr> <tr> <td>Weight</td> <td>Approx. 1.7 kg</td> </tr> <tr> <td>Maximum speed</td> <td>Approx. 30 cm/s</td> </tr> <tr> <td>Power consumption</td> <td>Max. 15 W</td> </tr> <tr> <td>Battery</td> <td>Lithium iron phosphate battery (LiFePO4) 12.8V DC</td> </tr> <tr> <td>Charging time</td> <td>Approx. 2 hours</td> </tr> <tr> <td>Operation time</td> <td>Approx. 90 minutes or longer (varies according to floor condition)</td> </tr> <tr> <td>Certifications</td> <td>KC Certification: MSIP-RES-HsM-HAF-HC200WH Adaptor Certification: YU10433-15001 Battery Certification: HU10452-14053A</td> </tr> </tbody> </table>	Cleaner		Product Name (Model)	i'sense dust carebot (HC200)	Dimensions	260 mm diameter x 126 mm height (including water tank)	Weight	Approx. 1.7 kg	Maximum speed	Approx. 30 cm/s	Power consumption	Max. 15 W	Battery	Lithium iron phosphate battery (LiFePO4) 12.8V DC	Charging time	Approx. 2 hours	Operation time	Approx. 90 minutes or longer (varies according to floor condition)	Certifications	KC Certification: MSIP-RES-HsM-HAF-HC200WH Adaptor Certification: YU10433-15001 Battery Certification: HU10452-14053A
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www.finerobotics.com



Robolink - Codrone

RoboLink: RoboLink is promoting businesses using intelligent drone called 'codrone' with the support of robot promotion business.

Codrone, developed jointly with Byrobot, is a robot package that combines entertainment elements of drones and robot control technology aimed for increased amazement and creativity of users.

It was developed under the concept of learning to code while playing around with a drone. It was designed to experience programming of drone by using actual education program and application program instead of simply controlling flying robots.

Robolink is planning to promote overseas drone distribution business based on overseas marketing, online funding, communities, contests and overseas fairs for exporting of intelligent edutainment (education + drone) business in US. It has already funded USD 205,643 from the crowd funding site, Kickstarter. With this, it has secured the distribution channel in US e-commerce site, Amazon, for full-scale advancement into global markets.

Robolink is also engaged in active business activities by establishing 'Robolink USA' and setting up Fab Lab in San Diego.

<ul style="list-style-type: none"> Flight Time: 8 min Battery Charge time: 40 min Flight Range: 160 ft IR sensors Gyroscope: 3-axis gyroscope and 3-axis accelerometer for attitude control 	<ul style="list-style-type: none"> Barometer Sensor: Assists with altitude control Hovering: Opt. air flow sensor for hovering Bluetooth 4.0 Dimensions: 133mm x 133mm Weight: Just 37 g 	
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