

RBR
50
COMPANY



Top Robotics Companies Continue to Innovate, Grow Market

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2019 RBR50: TOP ROBOTICS COMPANIES CONTINUE TO INNOVATE, GROW MARKET

Success comes in many flavors for robotics companies around the world.

By Keith Shaw, Robotics Business Review,
and John Santagate, IDC

Starting and growing any business is difficult, but when you're in an emerging market such as robotics, automation, or artificial intelligence, the highs are higher and the lows can be lower. The meteoric rise of new companies and competition, along with record investments and high demand from potential customers, can lead to distraction for even the most stalwart entrepreneur.

Throw in an intense spotlight from a media looking to make headlines around the negatives of robotics, and you have a recipe for potential disaster at every turn.

Yet the top companies in the robotics field continue to stay focused on their mission – building robots, software and services that enable companies to optimize their processes, improve efficiencies, become more profitable, or solve human worker labor shortages.

For the past eight years, the RBR50 has provided the robotics industry with its own spotlight on the leaders in the robotics, AI, and autonomy industry. *Robotics Business Review* has researched hundreds of companies in the space across numerous robot categories. Along with new partner IDC, the premier global provider of market intelligence and advisory services across technology markets, we are confident that this year's RBR50 list is the most comprehensive set of robotics companies worth following.

A GROWING MARKET

The robotics industry shows no sign of slowing down in the years ahead. Most forecasts in multiple robotics and automation predict strong growth, including:



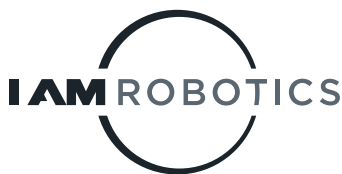


**IT'S NOT A QUESTION OF
WHETHER OR NOT CHANGE IS COMING.**

**IT'S A QUESTION OF
ARE YOU READY?**

Supply chains of the future require out-of-the-box thinking. Fulfillment processes need to be scalable, flexible, and adaptable. Gone are the days where logistics managers only have a few choices to automate material handling processes. At IAM Robotics, we developed the Swift Product Suite, the first autonomous materials handling solution that makes flexible automation a reality.

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Based in Pittsburgh, PA, a leading region for robotics development, IAM Robotics is the leader of flexible autonomous robotic material handling solutions for e-commerce order fulfillment and material handling in logistics and manufacturing. IAM's Swift Product Suite provides a complete robotic solution to existing labor shortages, accelerating e-commerce environments, and changing consumer expectations. IAM's innovative solutions mitigate growing logistics costs while offering a compelling ROI without sacrificing flexibility. This provides the competitive advantage distributors and retailers need in today's rapidly shifting marketplace.

- [A \\$53 billion market for commercial robots by 2022.](#)
- [Global spending on robots and drones](#) to top \$115 billion by end of 2019.
- Robot sales in the U.S. [set a record for the 8th year in a row.](#)
- Robot unit shipments in North America [grew beyond the traditional automotive industry.](#)
- In the warehouse space, more than [50,000 robots will be working in warehouses by 2025.](#)

WHAT'S DIFFERENT THIS YEAR

The vast amount of companies in the robotics space led to some changes in the types of companies we evaluated for the 2019 version of the RBR50. In the past, we cast a wide net across the robotics industry, and past winners have included technology giants such as Google, Amazon, Intel, and NVIDIA, to name a few. In addition, successful consumer robotics companies such as iRobot and UBTECH, which succeed despite a cooling in the consumer and home robot markets, are not a major coverage area for *Robotics Business Review* and its readership.

However, we acknowledge that these companies are providing the robotics industry with lots of influence in their work in the field of advancing artificial intelligence, robotics, and autonomous vehicle development. In the end, we decided that because their main business is not about robotics, that they would not make the final list of Top 50 Robotics Companies.

To address this, we've created a separate list, which we call "**Major Industry Players Influencing Robotics.**" This list includes the following companies for 2019:

| Company | Location | Area of Influence |
|-----------|-----------------------|-------------------------------------------------------------------------------------------------|
| Alphabet | Mountain View, Calif. | Self-driving vehicles (Waymo); aerial drone delivery (Wing); artificial intelligence (DeepMind) |
| Amazon | Seattle | Supply chain robotics, cloud robotics |
| IBM | Armonk, N.Y. | Artificial intelligence |
| Intel | Santa Clara, Calif. | Artificial intelligence, chipsets, investments |
| Microsoft | Redmond, Wash. | Artificial intelligence |
| NVIDIA | Santa Clara, Calif. | Artificial intelligence, chipsets, and robotics development |

| Company | Location | Area of Influence |
|----------|---------------|--------------------------------------------|
| Qualcomm | San Diego | Robotics development and chipsets |
| Toyota | Japan | Self-driving vehicle development |
| Uber | San Francisco | Self-driving vehicle development ecosystem |

EXPANDING OUR “COMPANIES WE’RE WATCHING” LIST

Last year, we began a separate list beyond the regular RBR50 to highlight companies that have not yet made it to the Top 50 list of companies, but are still worth looking at for companies looking to deploy robotics in particular markets.



Boston Dynamics’ Handle robot moves the company into the supply chain and warehouse arena. Image: Boston Dynamics

This year, we’re expanding the list of companies on the list, and will provide more explanations on why they made the list. These companies aren’t necessarily startups, but ones we feel are worth keeping an eye on over the course of 2019 into 2020.

For example, we’ve added **Boston Dynamics** to this list for 2019 – the research and development company has been in the robotics space for more than two decades, and is best known for its viral videos on YouTube showcasing defense-oriented robots such as the Atlas, Big Dog, Spot, and SpotMini. So why now? Mainly because the company is commercializing Spot and SpotMini for general purpose robot use, and its new Handle mobile picking robots, aimed at the supply chain and logistics space.

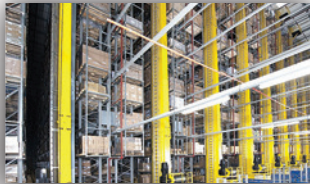
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2019
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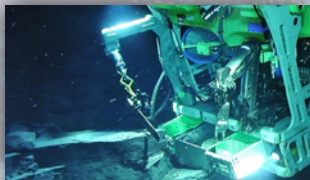
Automated Storage



Order Fulfillment



Material Handling



Harsh Environments



Defense



Fabrication



Factory Floor



Medical



Warehouse



Telepresence



Camera Control



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GOING SLIGHTLY BEYOND 50 “COMPANIES”

If you feel like counting all the companies, you'll notice that the final list has 54 companies instead of 50. You might suddenly feel like we've lost our ability to perform math, but let us explain. In some cases, larger companies own multiple divisions focused on robotics, yet these divisions run independently and have their own branding attached to it.

For example, Boston-based **Teradyne** owns three of the companies worthy of inclusion in the RBR50 – **Universal Robots**, **Mobile Industrial Robots (MiR)**, and **Energid**. Two of these companies were previous RBR50 winners, and we decided to honor Teradyne, but also acknowledge the three divisions in their own right. Similarly, we're honoring **KUKA AG** and its supply chain division, **Swisslog Holding**, for similar reasons.

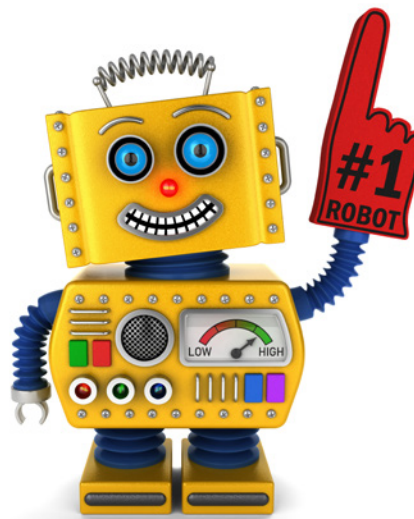
If this expands the list beyond the traditional 50, so be it. It's our list.

ONE MORE THING ...

Last year, we tried to balance the list among five categories that we felt were important growth areas in the robotics space. These categories – manufacturing, components, supply chain, artificial intelligence, and unmanned systems – were a mix of vertical industries and technology categories. It caused a bit of confusion.

For the RBR50 2019 list, we dropped the idea of balancing the list among those categories, and just chose the 50 companies we felt represented the top companies across the landscape. When we looked at our final list, some categories had more companies than others. This represents our interest in particular markets, as well as recent growth in those spaces. As the industry grows in new markets, the RBR50 2020 list could see fluctuations in these categories, or even new ones altogether.

Enough babbling, let's get to the list!



THE 2019 RBR50 WINNERS

COMPONENTS

[Advanced Motion Controls](#)

Location: Camarillo, Calif.

Main offerings: Servo drives, motion controllers

[Elmo Motion Control](#)

Location: Nashua, N.H.

Main offerings: Motion control, drives, motors



Image: Robotiq

[Energid](#) (via Teradyne)

Location: Cambridge, Mass.

Main offerings: Motion control

[Harmonic Drive](#)

Location: Peabody, Mass.

Main offerings: Precision motion control (servo actuators, gearheads, gear components)

[Genesis Robotics](#)

Location: Canada

Main offerings: Motion control, drives, actuation

[Kollmorgen](#)

Location: Radford, Va.

Main offerings: Motor solutions

[maxon precision motors](#)

Location: Taunton, Mass.

Main offerings: Precision motors and drive systems

[Micromo](#)

Location: Clearwater, Fla.

Main offerings: Micro motors and custom motor solutions and encoders

[OnRobot](#)

Location: Denmark

Main offerings: Grippers, end-of-arm tooling

[Robotiq](#)

Location: Canada

Main offerings: Grippers, sensors, vision for cobots

[Schunk](#)

Location: Germany

Main offerings: Grippers for industrial robots

[SICK](#)

Location: Germany

Main offerings: Intelligent sensors and optics for industrial automation, robotics

[Soft Robotics](#)

Location: Bedford, Mass.

Main offerings: Gripping solutions with soft components

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We also offer machine design and manufacturing expertise to help you optimize your robot.

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COBOTS

[Kinova](#)

Location: Canada

Main offerings: Assistive robots, grippers, mobile manipulators, cobots

[Universal Robots](#) (via Teradyne)

Location: Denmark

Main offerings: Multiple collaborative robot arms and applications

[Veo Robotics](#)

Location: Waltham, Mass.

Main offerings: Vision and software that make industrial robots safer for collaboration

AUTONOMOUS MOBILE ROBOTS

[6 River Systems](#)

Location: Waltham, Mass.

Main offerings: AMRs for warehouse, e-commerce fulfillment

[Geek+](#)

Location: China

Main offerings: Goods-to-person mobility for e-commerce fulfillment

[Bossa Nova Robotics](#)

Location: Pittsburgh

Main offerings: Robots for retail inventory management scanning

[GreyOrange](#)

Location: Alpharetta, Ga.

Main offerings: Goods-to-person mobility for e-commerce fulfillment

[Cobalt Robotics](#)

Location: Palo Alto, Calif.

Main offerings: Security monitoring and guard collaboration via mobile robots

[IAM Robotics](#)

Location: Sewickley, Pa.

Main offerings: Goods fulfillment and mobile manipulation systems

[Fetch Robotics](#)

Location: San Jose, Calif.

Main offerings: AMRs for manufacturing, warehousing



Image: inVia Robotics

[inVia Robotics](#)

Location: Westlake Village, Calif.
Main offerings: AMRs for warehousing and e-commerce fulfillment

[Locus Robotics](#)

Location: Wilmington, Mass.
Main offerings: Mobile robots for e-commerce fulfillment, software and cloud management

[Mobile Industrial Robots](#)

(via Teradyne)
Location: Denmark
Main offerings: AMRs for manufacturing and warehousing materials handling

[Simbe Robotics](#)

Location: San Francisco
Main offerings: Retail inventory management robots

[Starship Technologies](#)

Location: San Francisco
Main offerings: Mobile robots for last-mile delivery

[Swisslog Holding](#) (via KUKA)

Location: Switzerland
Main offerings: AMRs for materials handling, automated retrieval & storage

[Waypoint Robotics](#)

Location: Merrimack, N.H.
Main offerings: AMRs for manufacturing environments

INFRASTRUCTURE SUPPORT FOR ROBOTICS

[Humatics](#)

Location: Waltham, Mass.
Main offerings: Microlocation and intelligence for precision positioning for indoor and GPS-denied environments

PIECE-PICKING & AI

[Kindred](#)

Location: San Francisco
Main offerings: Piece-picking, AI software

[Osaro](#)

Location: San Francisco
Main offerings: Piece-picking, AI software



Piece-Picking Automation Software for Distribution Centers

Only Osaro's software detects challenging objects with **takt times under 5 seconds** and can **pick and place 100k+ SKU inventories**.

Osaro uses **all major robots**, a wide range of **end effectors**, and **low-cost sensors** for deployments in grocery distribution centers, food packaging plants, and e-commerce fulfillment centers.

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- **No SKU registration needed**
- **Reconfigurable Environments; Integration APIs**
- **Accommodates high velocity inventories**
- **Bin Packing & Segmented Totes**



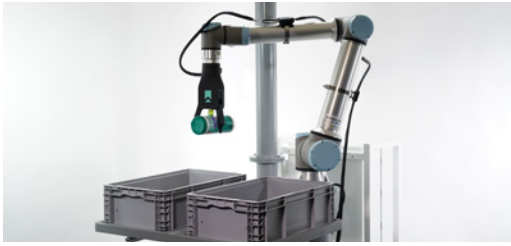
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[RightHand Robotics](#)

Location: Somerville, Mass.

Main offerings: Piece-picking, software, and solution partnerships

AUTONOMOUS VEHICLES

[Seegrid](#)

Location: Pittsburgh

Main offerings: Vehicles for materials handling in factories, warehouses

[ULC Robotics](#)

Location: Hauppauge, N.Y.

Main offerings: Pipeline inspection robotics, UAV aerial services for gas industry



Image: Vecna Robotics

[Vecna Robotics](#)

Location: Waltham, Mass.

Main offerings: Automated material handling and workflow optimization solutions in distribution, warehousing, manufacturing

AERIAL ROBOTS (AKA DRONES)

[DJI](#)

Location: China

Main offerings: Drone hardware manufacturer

[PrecisionHawk](#)

Location: Raleigh, N.C.

Main offerings: Drones, services, analytic software, pilot services for commercial drone operations

AUTONOMY SOFTWARE

[Brain Corp](#)

Location: San Diego

Main offerings: Operating system software that gives autonomy to existing commercial vehicles and robots



Image: Brain Corp

INDUSTRIAL AUTOMATION, ROBOTICS

[ABB](#)

Location: Switzerland

Main offerings: Industrial robots

[EPSON Robots](#)

Location: Carson, Calif.

Main offerings: Industrial robots

[FANUC](#)

Location: Japan

Main offerings: Industrial robots

[KUKA](#)

Location: Germany

Main offerings: Industrial robots

[OMRON Automation](#)

Location: San Ramon, Calif.

Main offerings: Factory automation, cobots, industrial robotics

[OPEX Corporation](#)

Location: Moorestown, N.J.

Main offerings: Goods-to-person order fulfillment and robotic sorting solutions

[Stäubli](#)

Location: Switzerland

Main offerings: Industrial robots, cobots

[Yaskawa](#)

Location: Japan

Main offerings: Industrial robots

HEALTHCARE OR SERVICE ROBOTS

[Intuitive Surgical](#)

Location: Sunnyvale, Calif.

Main offerings: Surgical robotics

[Corindus Vascular Robots](#)

Location: Waltham, Mass.

Main offerings: Surgical robotics

[Auris Health](#)

Location: Redwood City, Calif.

Main offerings: Surgical robotics

[SoftBank Robotics](#)

Location: Japan

Main offerings: Humanoid robots, customer service, assistive

[Sarcos](#)

Location: Salt Lake City

Main offerings: Industrial exoskeletons and robotic systems for dangerous work scenarios

[Ekso Bionics](#)

Location: Richmond, Calif.

Main offerings: Exoskeletons for rehabilitation, industrial worker support



ONE STOP SHOP FOR COLLABORATIVE APPLICATIONS

We provide the broadest range of easy-to-install tools and accessories for collaborative and light industrial robots. OnRobot end-of-arm tooling (EOAT) solutions are compatible with a wide range of major robot brands.

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VG10 Vacuum Gripper



RG2-FT



RG6 Gripper



RG2 Gripper



Quick Changer



Gecko Gripper

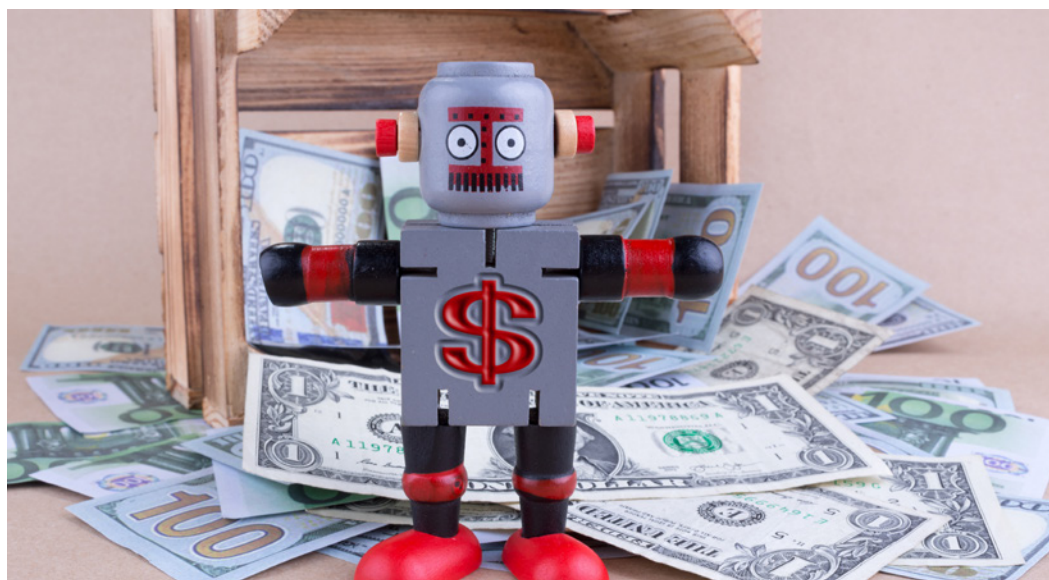
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NOTABLE TRANSACTIONS AMONG THE RBR 50



While not a requirement for the RBR50, large investments from venture capital firms are one of the measurements of success for a robotics startup. Here is a list of significant investments in robotics over the past year for several companies in the 2019 RBR50:

NOTABLE TRANSACTIONS AMONG THE RBR 50

| COMPANY | INVESTMENT AMOUNT | DATE |
|--------------------------|--------------------------------|----------------|
| 6 River Systems | \$25 million | January 2018 |
| Bossa Nova Robotics | \$29 million | June 2018 |
| Cobalt Robotics | \$13 million | March 2018 |
| Corindus Vascular Robots | \$25 million (post-IPO equity) | March 2018 |
| Geek+ | \$150 million | November 2018 |
| GreyOrange | \$140 million | September 2018 |
| Humatics | \$28 million | January 2019 |
| IAM Robotics | \$20 million | November 2018 |
| inVia Robotics | \$20 million | August 2018 |
| Locus Robotics | \$26 million | April 2019 |
| PrecisionHawk | \$75 million | January 2018 |
| RightHand Robotics | \$23 million | December 2018 |
| Robotiq | \$31 million (CAD) | December 2018 |
| Sarcos | \$30 million | September 2018 |
| Starship Technologies | \$25 million | June 2018 |
| Vecna Robotics | \$13.5 million | August 2018 |
| Veo Robotics | \$15 million | February 2019 |

COMPANIES WE'RE WATCHING

Across the robotics industry, these are the companies that we're keeping an eye on for this year and beyond. Whether they're shifting into new markets, or they have yet to make a commercially successful impact, these companies are worth investigating for those interested in where the industry may be heading over the next few years.



Alert Innovation: Starting with grocery stores, this company aims to transform how people shop and retailers operate in the future. The Novastore Alphabot is creating a new kind of automated supermarket – it's 45 feet high, has two floors, and occupies a footprint of 17,000 square feet. On the first floor is a self-service fresh market, with no checkout lanes and no center store or cold/frozen areas. All packaged goods are ordered by customers electronically, with robots delivering the goods to curbside for pickup by the customer, or delivery van. Customers can order the fresh goods or choose to pick themselves in the store. With Walmart as its first customer, Alert Innovation is on a fast track towards success.

Autonomous Solutions Inc.: For more than 18 years, ASI has been working on unmanned ground vehicle solutions for the mining, agriculture, automotive, military, and manufacturing industries. Its remote control, tele-operated, and fully automated systems provide companies with many options for automating vehicles across these vertical markets. We're especially impressed with its Mobius unmanned command and control solution, as well as its automated convoy systems.



Boston Dynamics: As

mentioned earlier, this company isn't a startup, but has been in the research and development side of robotics for many years, with offerings geared towards the defense industry, as well as research (it's Atlas humanoid

robots were used by many teams in the DARPA Robotics Challenge in 2013-2015). With a vast following of its YouTube videos that delight and frighten many, the company has recently entered the commercial space with its robots, including a wheel-based robot that can load and unload boxes on pallets. We'll see whether the company can create as much buzz for its "work" robots as much as the ones that can jump over logs or pull trucks.

Exotec: This French company is creating an order-picking system based on fleets of mobile robots that work in three dimensions, transporting and storing bins containing items in racks up to 10 meters high. The Skypod robots can navigate warehouses without guidance infrastructure, and is flexible and adaptable to a company's needs. Not only do the robots from Exotec autonomously navigate, the robot itself climbs the racking, extracts or replaces bins, and then slides back down to the floor and moves on to the picking station or on to the next pick.

Exyn Technologies: This spinoff company from the University of Pennsylvania's GRASP Laboratory is developing software for aerial and ground-based robots to autonomously navigate and collect data where maps and GPS don't exist, such as dangerous underground areas. The company's platforms don't rely on human control, and are built with multiple redundant sensors, mapping for obstacle avoidance, and independent planning.

Flexiv: This cobot company is creating adaptive robots that integrate force control, computer vision and AI technologies for the manufacturing industry. Its Rison robot combines direct force control with advanced AI, giving customers greater performance and a broader scope of robotic tasks for industries including manufacturing, healthcare, and retail, among others. The robot includes greater tolerance in position variance, high disturbance rejection, and intelligent transferability for quick redeployment between similar product lines or tasks.

Flyability: One of the worst jobs on the planet has to be inspecting oil tanks, boilers, chimneys and other dark, indoor, underground and tiny spaces. Swiss company Flyability is helping those workers with its range of small, flexible, yet rugged indoor drones that can perform inspections of those small spaces. The latest version of its Elios drone platform vastly improves photo and video quality, along with lighting improvements that pinpoint potential problems for industrial infrastructure.

HEBI Robotics: Pittsburgh-based HEBI creates hardware and software tools that will make it easier to create customized robots more quickly. The platform, used by academic and industrial roboticists around the world, helps them speed up development, iterate quickly, and solve real-world problems through robots. The company is giving tools to more quickly democratize the creation of robots.



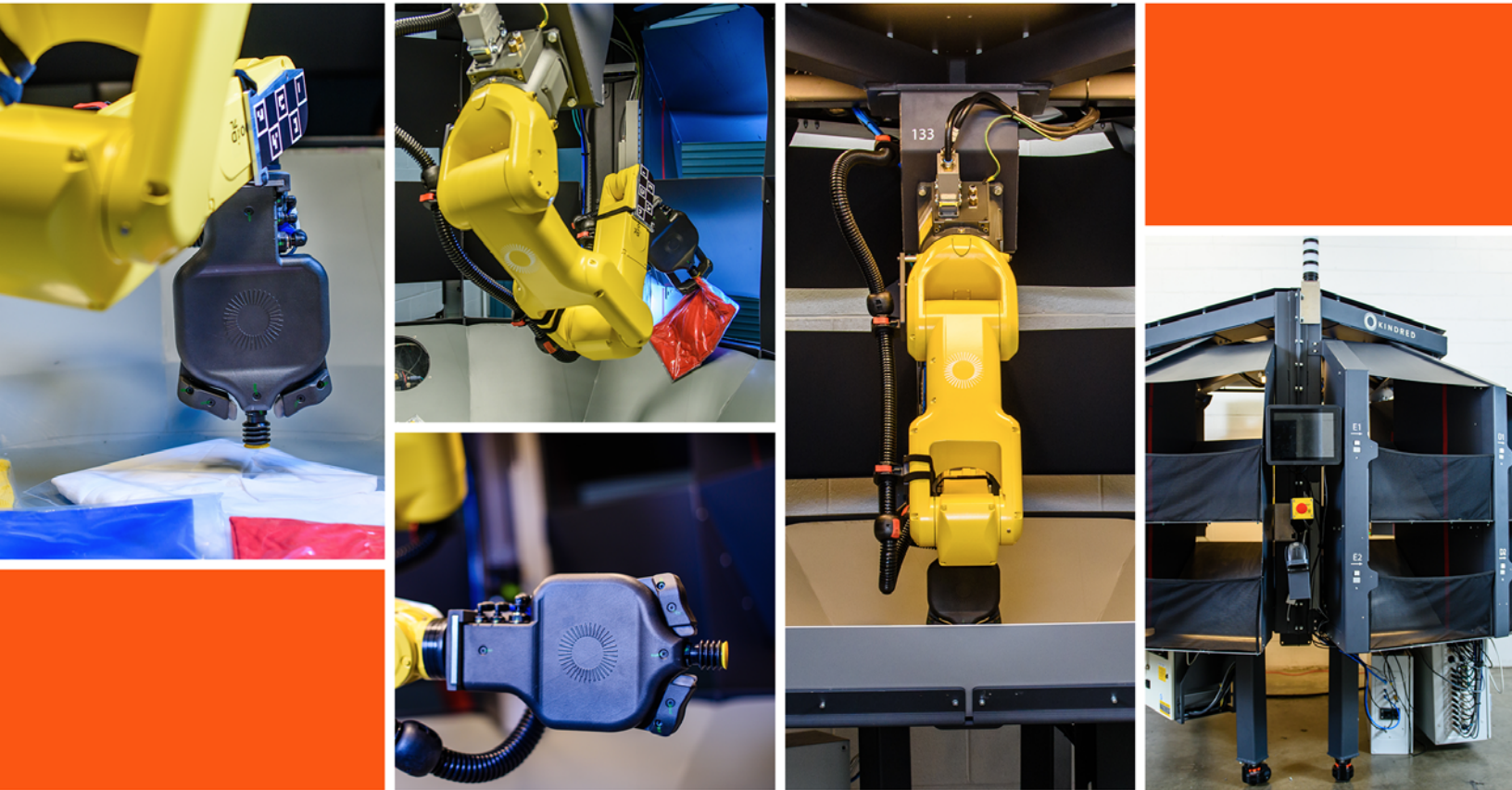
Impossible Aerospace:

Extending battery life on small unmanned aerial systems is a big concern for many end users, especially those in the public safety sector who are looking for longer times up in the air. This startup redesigned its drones to include a longer battery life for its systems, and partnerships with open-source software

maker Auterion and others have us believing the impossible.

Magazino: This German company has created autonomous picking robots for shoe boxes and robots for industrial picking supplies. The robots can perceive their environment and make their own decisions, working alongside people to optimize processes in e-commerce, fashion, and production logistics. In addition to creating an autonomous mobile robot that can pick items from shelves, this company also leverages a cloud-based intelligence network to share interactions so that what one robot encounters for the first time in one location is then a lesson learned for robots in other locations that might encounter the same.

Revolutionizing Order Fulfillment



Leading retailers are using Kindred's smart piece-picking solutions to overcome the increasing complexities of next-gen supply chains.

Using advanced AI, SORT robots operate autonomously to pick, process, and place multi-SKU batches resulting in higher productivity.



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Miso Robotics: One of the hottest trends in robotics in 2019 is food robotics, and the makers of Flippy, the hamburger-flipping robot, are leading this trend. In addition to Flippy, this Pasadena, Calif.-based company has integrated robotics and machine learning into deep-



Image: Miso Robotics

frying examples, serving up thousands of chicken fingers to the likes of fans at Dodger Stadium and beyond. An example of robots taking on the task of repetitive and ‘dangerous’ tasks (nobody likes standing in front of a deep fryer all day), these systems also work collaboratively with restaurant staffers.

NextShift Robotics: Lowell, Mass.-based NextShift Robotics recently received a patent for vertical lift capability as part of its robotic picking process, giving its next-generation autonomous mobile robots additional features for order fulfillment and warehouse materials management tasks. We’re waiting to see whether NextShift can take the next step with lots of competition in the AMR space these days.

Productive Robotics: Spun out of its origins in the robotic camera systems market, this company is now developing 7-axis collaborative robots for manufacturing and other task-oriented applications. It’s line of OB7 robots include an easy-to-learn teaching platform for end users to train the robots on tasks quickly. It will be worth watching this company to see how they tackle some of the larger cobot companies in the space.

Smart Ag: In the agriculture arena, we’re very impressed with the quick rise of Smart Ag, an Ames, Iowa-based firm developing driverless tractor systems. Their autonomous farming platform changes the way that farmers can approach agriculture by increasing productivity, decreasing effort, and maximizing profitability. The company’s AutoCart fully automates a grain cart tractor and provides farmers with labor assistance during demanding harvest seasons. It will be interesting to see if this company can grow with large farming equipment vendors also looking to develop autonomous vehicles.

Image: Wibotic



Wibotic: With the explosive growth of autonomous mobile robots these days, all of that movement will eventually drain batteries. We're paying attention to Wibotic, which develops wireless power solutions for autonomous battery charging on any type

of robot – including aerial drones, mobile robots, underwater vehicles, and battery-powered industrial automation devices. The company's technology gives a wider range of positional flexibility between transmitting and receiving antennas, which is critical for robots that need high precision in their location.

XYZ Robotics: Similar to other companies in the piece-picking and AI space, XYZ is developing robotic technologies to transform supply chain automation, with put-wall sorting and goods-to-person picking, where its robot can sort unorganized, random warehouse goods into groups of customer orders. We can't wait to see this company grow in this segment of the market.

ABOUT THE AUTHORS:

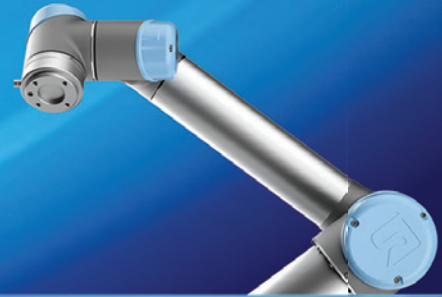


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