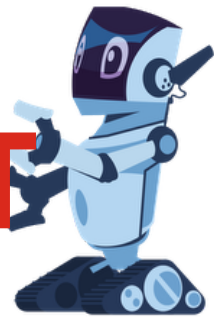




A WORLD WHERE

PEOPLE AND ROBOTS COEXIST



SEBASTIAN: THE COBOT

THE FIRST COBOT OR COLLABORATIVE ROBOT INSTALLED AT MAGNA'S POWERTRAIN PLANT IN NEUENSTEIN, GERMANY CAN HIGH-FIVE CO-WORKERS WITH HIS "HANDS" AND HAS EXPRESSIVE "EYES" MADE UP OF TINY LEDS THAT CHANGE COLOR. IF EVERYTHING IS WORKING FINE, HIS EYES ARE GREEN. IF THERE IS SOMETHING WRONG, THEY TURN RED.

This cobot seems so full of personality that he's even earned a nickname.

It's "Sebastian" because he reminds co-workers of the singing crab in Disney's animated feature film *The Little Mermaid*. The cobot's computer screen even features a tiny image of his crustacean namesake.

But unlike the cartoon character that composes catchy Caribbean songs like *Under the Sea*, Magna's Sebastian has a more serious and important assignment.

His task is to relieve shop-floor employees of some of the monotonous and tedious work at the plant. Sebastian's job is to put gaskets into the three pumps that go into a transmission. It's a daunting task, since the Neuenstein plant builds approximately 5,400 pumps a day. Unlike his human counterparts,

"The people who were doing this have been moved into better jobs on the assembly line," said Robert Kraft, the Magna process engineer responsible for the Sebastian project. "Operators find it cool that Sebastian is on the line. He's a robot you can look at and immediately understand what he's doing. He has two arms like you and he's the size of a human body. You can touch him and he doesn't hurt you. Everyone is proud of him."

Today, Sebastian is such a part of the team that some of his co-workers have suggested outfitting him with a COVID-19 mask, so he looks like everyone else.

On a more serious note, Kraft said Sebastian is helping to create "an environment where robots and people coexist."

Magna engineers are examining the Neuenstein assembly line to find other use cases for cobots like Sebastian. In the meantime, plans for upgrades to Sebastian continue.

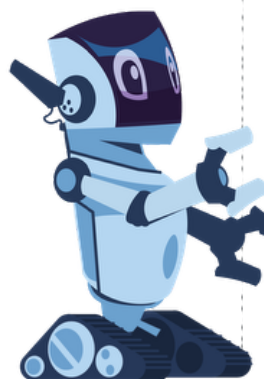
"We want to make him even more human," Kraft said.



Sebastian (technically a programmed ABB “Yumi” model) is capable of working around the clock, seven days a week.



ROBERT KRAFT: THE PROCESS ENGINEER



Robert Kraft says being the process engineer responsible for the Sebastian cobot project at Magna’s Neuenstein, Germany, powertrain plant has been “fun, creative and fascinating.”

In other words, a great start for a first job after finishing his education.

Kraft came to Magna three years ago after earning a master’s degree in production management from Mannheim University of Applied Sciences in Germany.

The challenge: help the Magna plant take another step in automation technologies by launching the first collaborative robot used on the assembly line.

“An industrial robot normally communicates like a washing machine,” Kraft said. “A code such as ‘F11’ may pop up on its screen, and a co-worker has to figure out the problem. Instead of error codes, a cobot like Sebastian is programmed to look for a co-worker and indicate ‘I need more material’ or ‘I’ve run out of gaskets.’ He is able to raise his arm and wave at co-workers.”

When Sebastian joined the assembly line, Kraft would often sit next to him during the day and monitor him as he executed his tasks.

“I am very proud of him,” Kraft said. “He’s my firstborn.”

The decision to join Magna was the right one, he notes.

“Neuenstein is a cool place to work,” Kraft said. “I’m free to choose the projects I want to work on and to look for projects that will bring Magna the most benefit.”

THE DIFFERENCE BETWEEN COBOTS AND INDUSTRIAL ROBOTS

A cobot or collaborative robot like Sebastian features human-like dexterity and requires no fence or similar safety equipment to ensure safe operation alongside humans in an assembly plant. This allows other operators to work closely to the robot or fill its material magazines while the robot is running in automatic mode.

Traditional industrial robots are typically large, fixed equipment often located behind fences or inside of cages for safety reasons in a manufacturing facility.



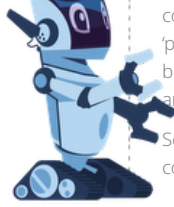
THE SEBASTIAN PROJECT: POSITIVE FRICTION

The Sebastian cobot project at Magna’s Neuenstein, Germany powertrain plant was an “important milestone” that highlights the “entrepreneurial spirit” of the company, according to Alexander Zak, Magna’s director of R&D – Advanced Robotics.

“Divisions are trying out new technology by themselves,” Zak said. “This approach drives us to be successful and to have a little bit of

By 2023, there will be several hundred of new Cobot’s, fenceless robots and traditional robots with bin picking software and 2D/3D vision cameras to locate parts at Magna’s global facilities, said Zak, who leads the advanced manufacturing initiative within the company.

“Robots and people are an unbeatable combination,” Zak said. “We see lots of



competition within the company. We have 'positive friction' within Magna. We are all brothers and sisters, but as with all brothers and sisters, there is competition."

Sebastian is not a one-off within the company.

potential and opportunities."

He added: "We're focused on robots because they can do the dirty, dull and dangerous jobs. By increasing the level of automation, we can provide better jobs for our employees and help them enhance their skills. There will be an important shift in the workforce. If you're a material handler today, you may become a robot maintenance person or the shift leader of a 'robot farm.'

"Everyone needs to get into the mindset of where we are going and why. We're doing this to increase productivity and reliability and reduce capital cost and production floor space."



MAGNA ADVANCED ROBOTIC SOFTWARE: 'A HUGE BREAKTHROUGH'

Making robots more adaptable and flexible is the goal of Magna Advanced Robotic Software or MARS, designed with a software development and integration partner.

Ten applications utilizing the first version of the software within Magna were installed in 2020 in seven divisions across Europe and North America; 15 Magna additional divisions are slated to receive the software before the end of 2021. The software is designed to aid robots with 3D vision and enable them to pick randomly mixed parts for processing.

"It's a huge breakthrough," said Alexander Zak, Magna director of R&D – Advanced Robotics located in the USA. "MARS gives robots 'eyes' so they can see and pick up parts."

Magna divisions in Bari, Italy; Rosenberg, Germany; Ramos Arizpe, Mexico; Muncie, Indiana, and MSM in Ontario, Canada, will be among the first to benefit from MARS.

For example, MARS will aid the Bari division in building the DCT300 transmission.

"There was no way for the robot to pick parts without 3D vision," said Duane Matheson, engineering implementation manager for Magna R&D located in USA. "The parts, which include two gaskets, three pumps and bolts, are not in the same position every time. We are providing software to add vision to the robot."

At Ramos Arizpe, MARS will help robots with the assembly of driveline components.

"Our divisions are looking at how to put robots to use in unique and better ways," Matheson said. "We're providing a tool to help them. MARS doesn't exist anywhere else. It puts us in a leadership position."



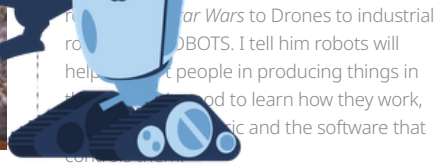
ALEXANDER ZAK: MY FAVORITE ROBOT

In his off hours, Alexander Zak and his 10-year-old son Viktor tackle "fun projects" like building Lego robots.

"You can program them with an iPad and they can do certain tasks and even play ice hockey," Zak, Magna director of R&D – Advanced Robotics, said. "The hockey robot has a program to swing. Wheels drive it forward to the puck."

Zak is interested in any type of





DUANE MATHESON: MY FAVORITE ROBOT

Creating robots that “danced” to the music during Jon Bon Jovi concerts was part of Duane Matheson’s repertoire before coming to Magna.

During the rock singer’s Circle Tour, giant LED video panels were moved with precision timing by ABB industrial robots. Bon Jovi danced on the panels, which morphed into a stairway as he walked up the various screens during the concert.

“The biggest challenge with the Bon Jovi robots was timing and overcoming what the artistic people wanted to do that was not safe,” said Matheson, engineering implementation manager for Magna R&D. “I basically had five robots that could squish every one of us.”

Mixing entertainment, robots and high tech has been a key part of Matheson’s work experience. He also worked at a stunt company in Las Vegas that made high-speed flying winches for the Spiderman movie.

“Making people fly through the air was part of my dream job doing controls for movies, stunts, shows and Cirque du Soleil,” he said. “That multi-disciplined experience has helped me with what I do today at Magna. Robots are a key part of a lot of the stuff I’ve done in my life. I’m intrigued by the speed and the strength of industrial robots.”



Duane Matheson, engineering implementation manager for Magna R&D

