3DEXPERIENCE® Edu

SKILLS WANTED FOR SUSTAINABLE INNOVATIONS

MECHATRONICS ENGINEER

EBOOK

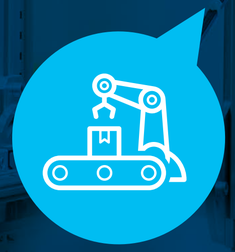
DASSAULT SYSTEMES

We’re experiencing a global Industry Renaissance today, bringing new ways – real and virtual – of seeing the world, inventing, learning, producing and trading. Tomorrow’s game-changers will not be those with the most automated production systems, but those who build a culture of knowledge and know-how to reveal and train the Workforce of the Future, able to solve the challenges of a planet lacking sustainable solutions.

BERNARD CHARLÈS
Vice Chairman of the Board
and Chief Executive Officer

At Dassault Systèmes, we are convinced that the future is about people, that the only progress is human. In order to create a more sustainable world, people need to be empowered with knowledge and know-how.

Technologies are reshaping the world of work. Jobs are transformed and new jobs requiring new skills are emerging. Dassault Systèmes, as a strategic transformation partner for many Industrial Customers, plays a unique role in this jobs transformation.



At Dassault Systèmes, our **3DEXPERIENCE®** Edu universe is committed to improving people's skills and employability throughout their lifetimes. "To foster industry growth, people must be able to adapt to new ways of working, businesses must equip workers for fast-evolving roles and find workers that have the right skills," said Florence Verzelen, Executive Vice President, Industry, Marketing and Sustainability, Global Affairs at Dassault Systèmes.

We are very pleased to share this publication of **3D**EXPERIENCE Edu, whose missions include fostering collective intelligence on key emerging roles and skills.

This ebook is part of a publication series called "Skills wanted for sustainable innovations" that shares the views of **3D**EXPERIENCE Edu and our ecosystem on the evolution of the key roles and top skills for the Industry Renaissance. This publication is about the role of **Mechatronics Engineer**, a key role for the industry of the future to help creating sustainable products, machines and innovations and overall, driving environmental sustainability.

EXECUTIVE SUMMARY

With smarter components, more complex systems, increasing interactions and communications between machines, Mechatronics is at the core of the Industry Renaissance. Mechatronics professionals will be more and more in-demand to meet the challenges of today's industry. This ebook highlights Mechatronics Engineers' missions and key skills, and explains how this job is critical to create sustainable innovations.

We will explain how Mechatronics systems optimize many of the products we use daily while reducing their environmental impact.

You will hear from several experts from the industry and academic world sharing their views about the evolution of the mechatronics engineer role and the skills required to be successful. Finally, we will demonstrate some job outlook data detailing current job openings and sustainable education programs offered in many universities across the globe.

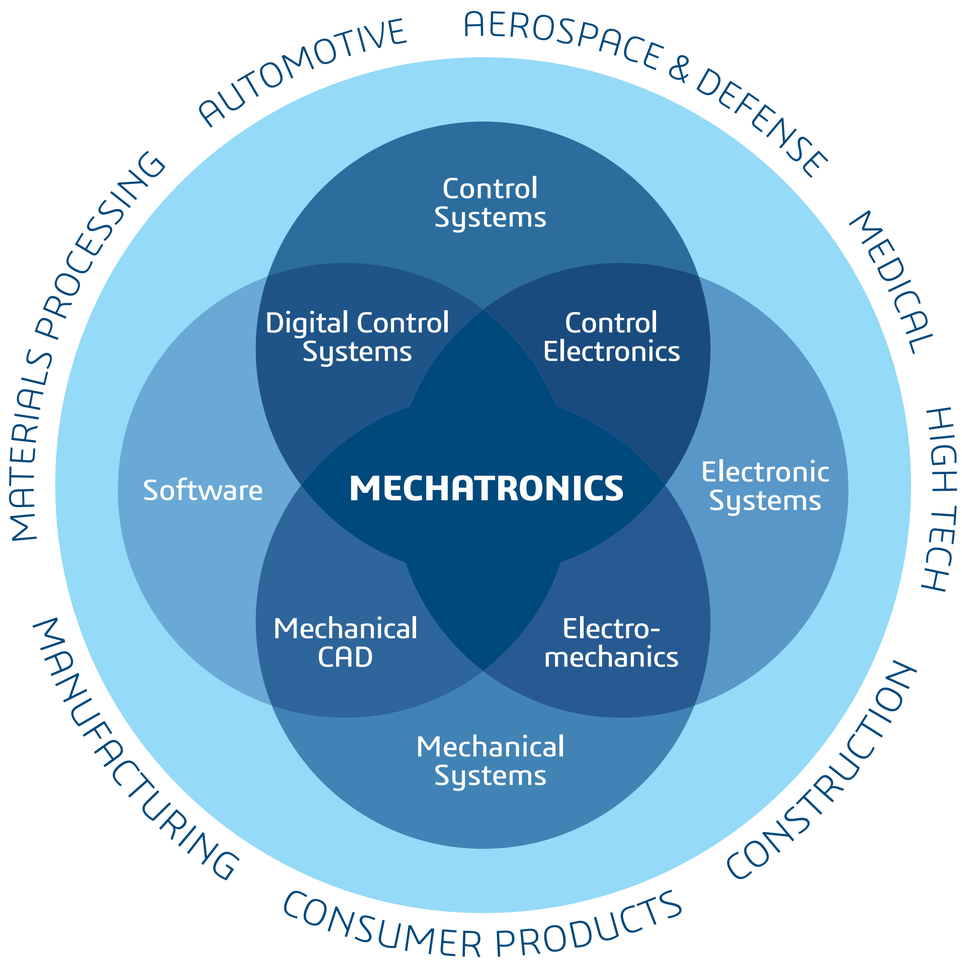
INTRODUCTION

What do a computer, a car, a dishwasher, a cardiac pacemaker, a robot on an assembly line and a coffee maker have in common? They all have mechatronics at their core system. Indeed, mechatronics systems represent a multidisciplinary field that includes a combination of mechanical, electrical, control and software, that is, today the heart of all smart devices.

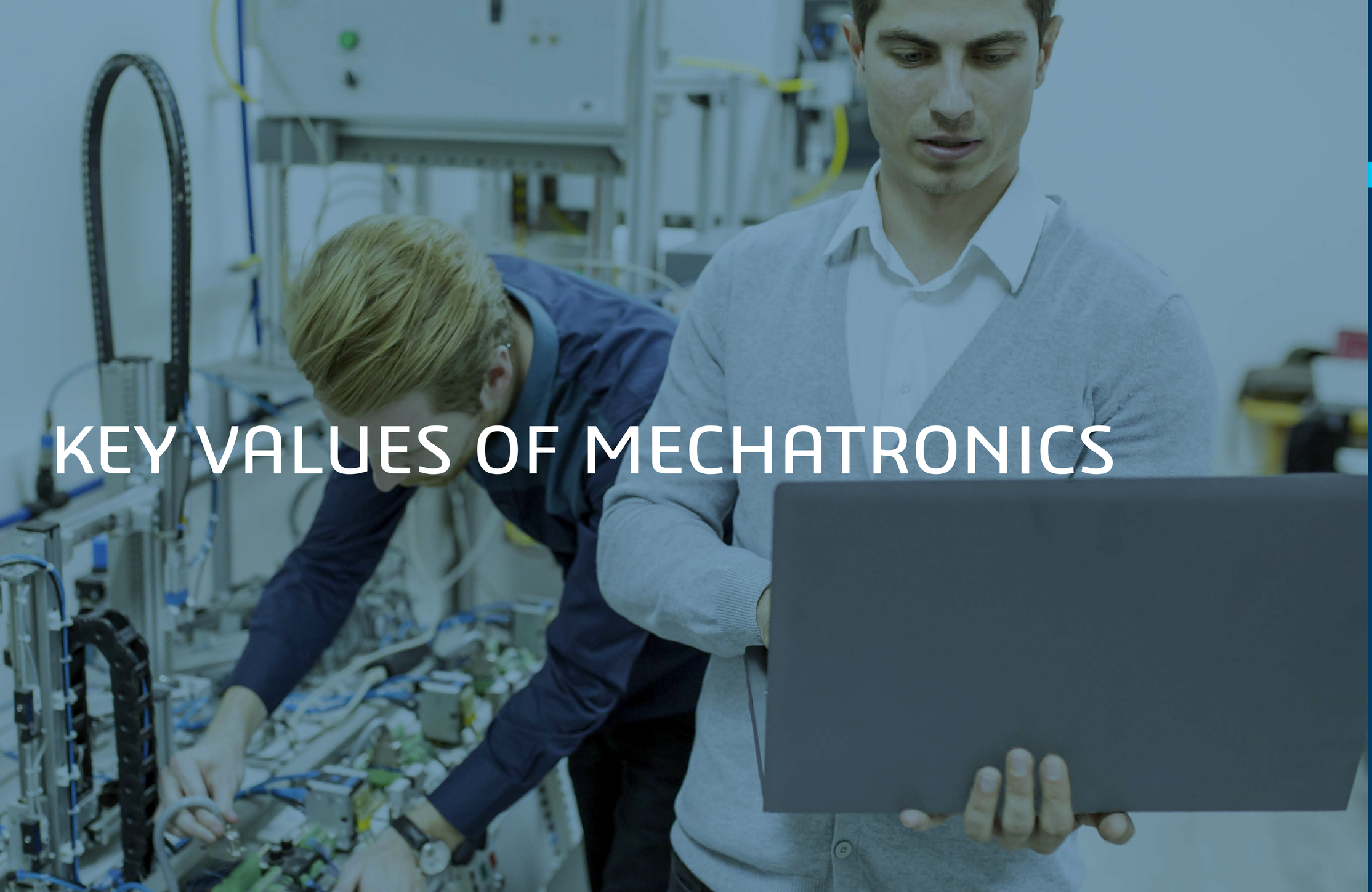
According to MDPI site, Mechatronics can be defined as "the combination of mechanical and electronic engineering with computational power. The design of any mechatronic system is a multidisciplinary activity and is performed to attain product-related advantages, which cannot be obtained by monodisciplinary efforts."

The discipline was originally introduced in the late 1960s but has been continuously evolving to optimize the automation of industrial or mechanical systems. Thanks to new technologies, modern mechatronics may now integrate elements of artificial intelligence, cybersecurity, telecommunications, optical engineering, sensory technology and controls, etc.

Mechatronics engineers' role exists in almost all industries, from Aerospace, Robotics, Medical, Automotive, Materials and High Tech, to Mining, Manufacturing Equipment and Construction. They may also work within a laboratory conducting research. A skilled workforce in Mechatronics is therefore required in all of these industries and the demand will continue to grow, considering the key advantages mechatronics offers in terms of maintenance and energy efficiency optimization.



Source: Aerial Euler diagram, Rensselaer Polytechnic Institute



KEY VALUES OF MECHATRONICS

DID YOU KNOW?

According to Artema, the French Mechatronic Industries Association, "Mechatronics is fundamental to build the industry and the factory of the future."

The main driving force in Mechatronics is to integrate technologies from traditional disciplinary fields in engineering and computer science to develop autonomous systems that are more sustainable, customizable, robust and cheaper than traditional systems.

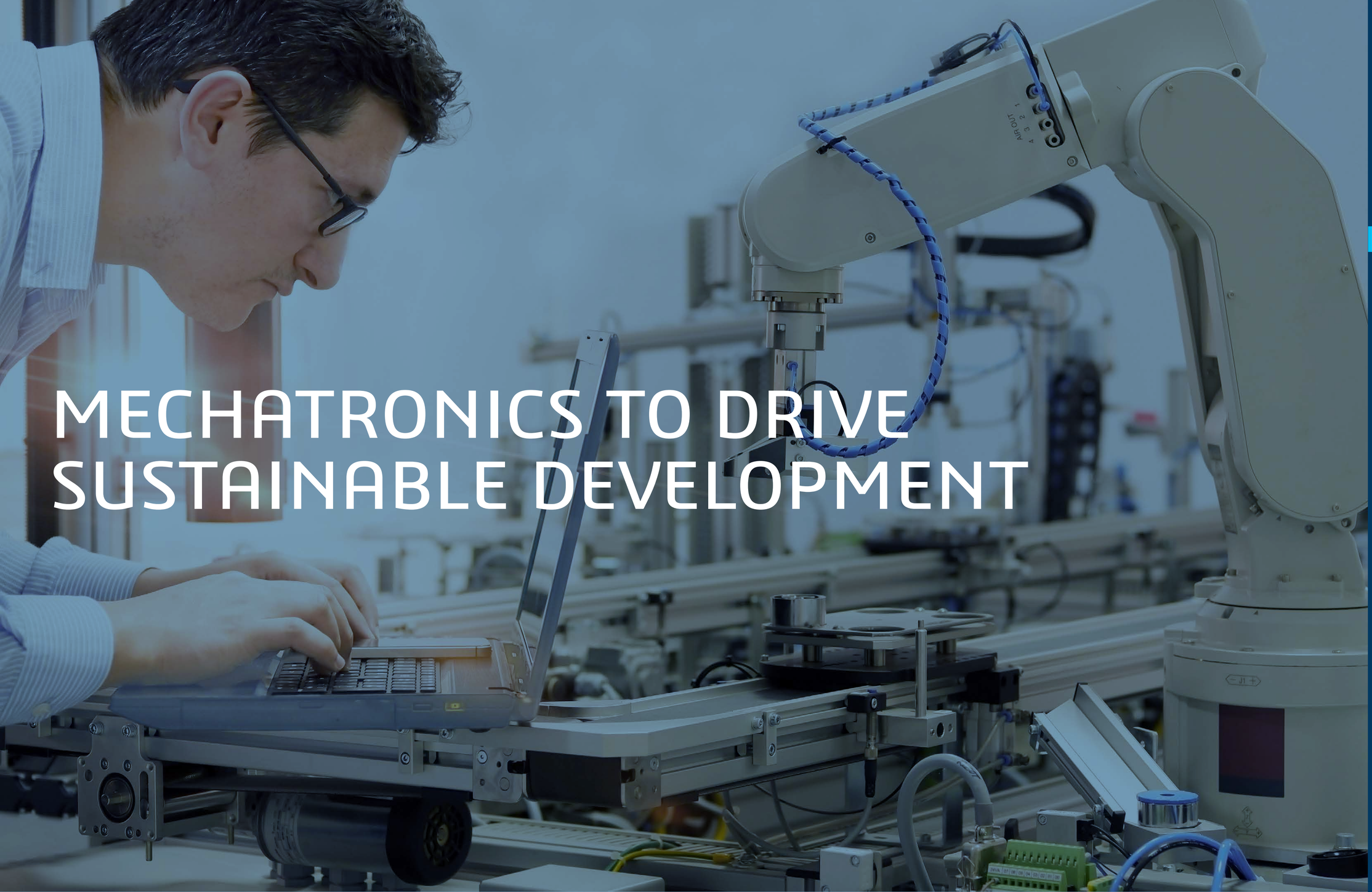
Optimize maintenance, safety and security

Thanks to the intelligence they contain, machines may self-diagnose and alert operators in case of failure. This capability enables machines to operate at the right time while optimizing their safety, security and maintenance. Then, predictive analysis and preventive maintenance become possible at the time of the installation onward. This reinforces the reliability of all types of equipment.

Improve energy efficiency

Mechatronics engineers will use applications to determine the best design, based on their customer needs: use of hydraulics, pneumatics, mechanics or electrics in order for the product to be efficient and to save energy. According to Artema, using "Mechatronics solutions can help a company to save up to 90% energy."

To the right, are some of the common applications of mechatronics, like Robotic automation, Home and building automation, Computer-driven machinery, Medical imaging systems, robotic surgery, Machine inspection, Control systems, Automotive engineering or transportation, smart grid, sustainable buildings, etc.

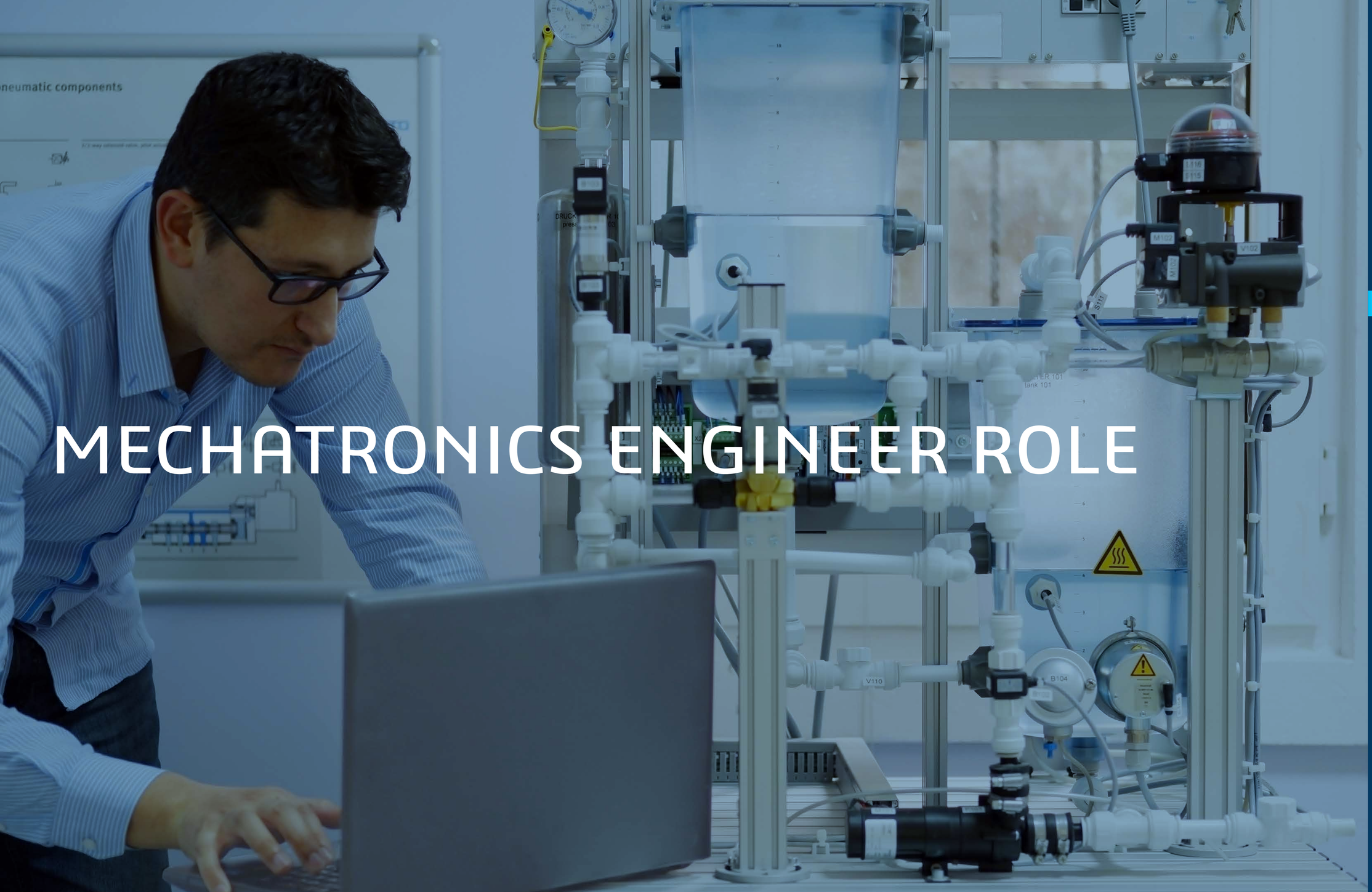


MECHATRONICS TO DRIVE SUSTAINABLE DEVELOPMENT

One of the goals of mechatronics is to meet sustainable development requirements. To drive environmental sustainability, **ecomechatronics** is an approach in which mechatronics technologies are applied in order to design a product or system that is the smallest, the cheapest to produce and the most energy-efficient to operate. Therefore, ecomechatronics impacts the way mechatronics systems and machines are being designed and implemented.

Ecomechatronics allows Mechatronics engineers to create high impacts in solar power and consider new power sources: wind energy, biofuel, hydropower and geothermal technologies. They must be able to also contribute to the reduction of energy consumption and the ecological impact of machines to allow the recyclability of some components to create more efficient systems. If failures are detected on a machine, the mechatronics engineer will be able either to carry out self-repair or repair it himself, and not completely change it.

Other advantages offered to mechatronics engineers are that capability of customizing components that allow significant energy savings, like cost, size and weight reduction, automatic system shutdown when not in use, and design simplification or flexibility.



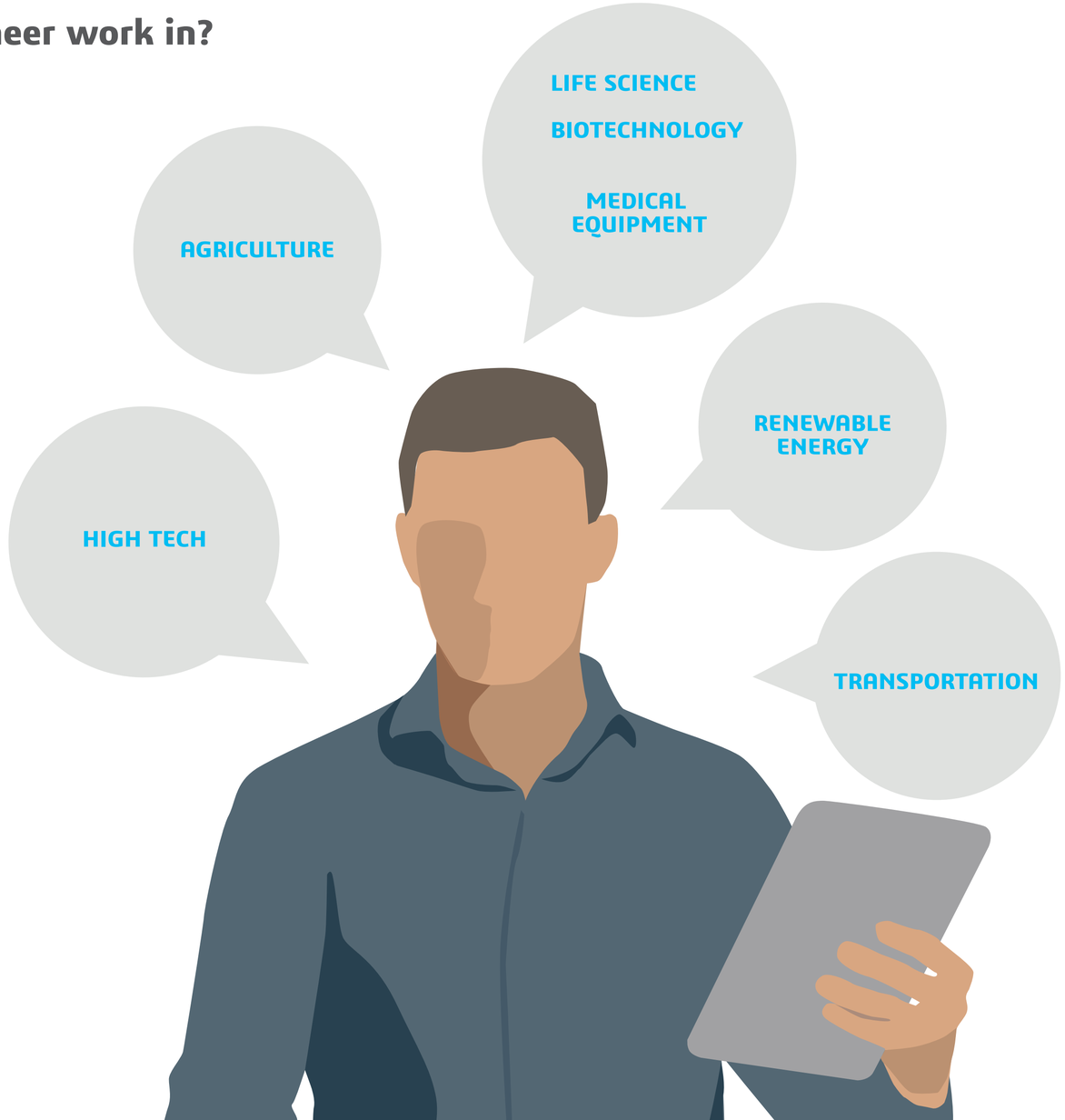
MECHATRONICS ENGINEER ROLE

What does a Mechatronics Engineer do?

According to O*NET Online, **Mechatronics Engineers** "design, develop, or test automation, intelligent systems, smart devices, or industrial systems control." In terms of knowledge, the website indicates that "engineering, design, mechanical, computers and electronics, and mathematics" are essential knowledge for mechatronics engineers. Thus, mechatronics engineers have a cross-disciplinary knowledge base that enables them to collaborate with mechanical, electrical or software engineers in some engineering projects to solve problems that are at the intersected areas between several engineering domains. They think holistically about a mechatronics system rather than focusing on a specific domain, requiring a system integration approach and systems thinking skill.

Which domains does a Mechatronics Engineer work in?

Mechatronics is used in many different industries. The discipline offers diverse career choices. On the next page, discover some examples of Mechatronics jobs and different missions that professionals may work on.



High Tech

Mechatronics engineers in telecommunications and information services build and manage systems that transmit broadband signals, switch data through networks, connect smart sensors that monitor our environment, design computer networks, videoconferencing equipment, fiber-optic cables, electrical systems and more.

Agriculture

In the United States, for example, agricultural robots and mechatronics support farmers by creating agricultural innovation, such as agricultural drones to monitor crop growth, autonomous tractors. The number of agricultural autonomous vehicles can also meet the challenges of an increasing food demand. The need for experts in this industry continues growing, considering the size of this increasing market.

Life Science, Biotechnology and Medical Equipment

In the medical field, mechatronics professionals design, build, improve or repair clinical equipment, micro-implants, prosthetics, smart wearables and create an impact on surgical procedures and rehabilitation hospital strategies.

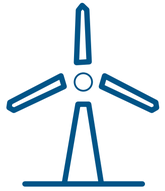
Renewable Energy

Mechatronics engineers in renewable energy will work on designing and testing new prototypes and other flexible energy solutions. The role is focused on developing new energy systems and technologies based on renewable sources, for multi-energy generation, particularly for distributed systems.

Transportation

Mechatronics engineers are more and more in demand to meet growing needs in the automotive and transportation industries. Rapid development of intelligent control systems has brought changes and led to the development of autonomous or self-driving vehicles. To overcome traffic and environmental issues, self-driving transport and driver assistance systems uses a number of sensors for vision and navigation systems, actuators to control mechanical systems, and computers to process the data.

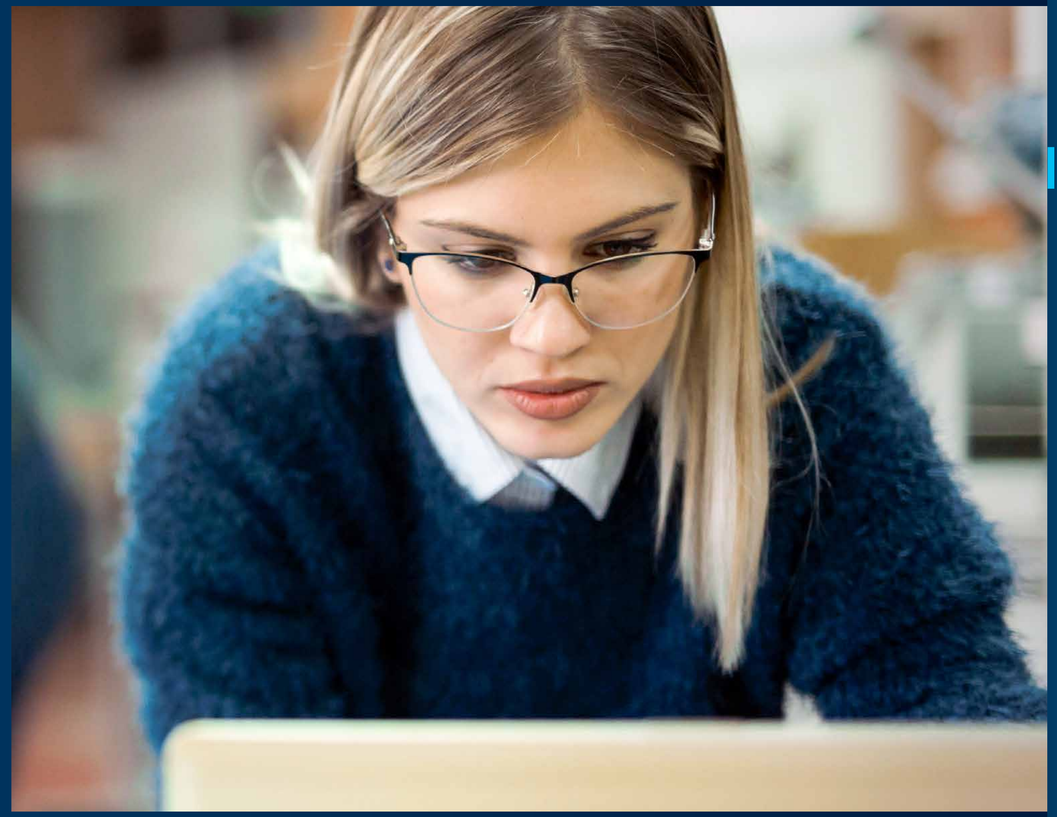
All these domains require skilled engineers that will bring their expertise to reinforce the trend that is being started.



In the shoes of Diane, Mechatronics Engineer in Automotive Industry

My job is not just about creating automotive solutions but innovating with sustainable and energy-saving solutions. And I think this is the most exciting and challenging part of my job!

DIANE
Mechatronics Engineer



Meet Diane

Diane is a Mechatronics Engineer working for an Automotive company. All car components now incorporate Mechatronics, especially autonomous cars. Diane has been in charge of different engineering systems. Enhancing braking systems currently represents the biggest part of Diane's job. One of the main challenges of autonomous automotive is to make sure the braking system is safe and efficient, and that hybrid or electric vehicles can recover energy from their braking systems. To achieve this, Diane creates sophisticated systems that deliver safety and performance enhancements. She also needs to collaborate with her colleagues from other engineering services for peer-review at almost every step of the design. She is a vital member of the Mechatronics team, working closely with other Mechatronics engineers and key members of the specific application team and supplier teams to support the product and develop robust solutions.

Diane's background: Diane graduated with a Master's degree in Electrical and Computer Engineering. She started her career working for a company where she produced designs and layouts of complex automotive systems and components. When she realized the value of mechatronics, she enrolled in a 2-years Automotive Mechatronics program to upgrade her skills.

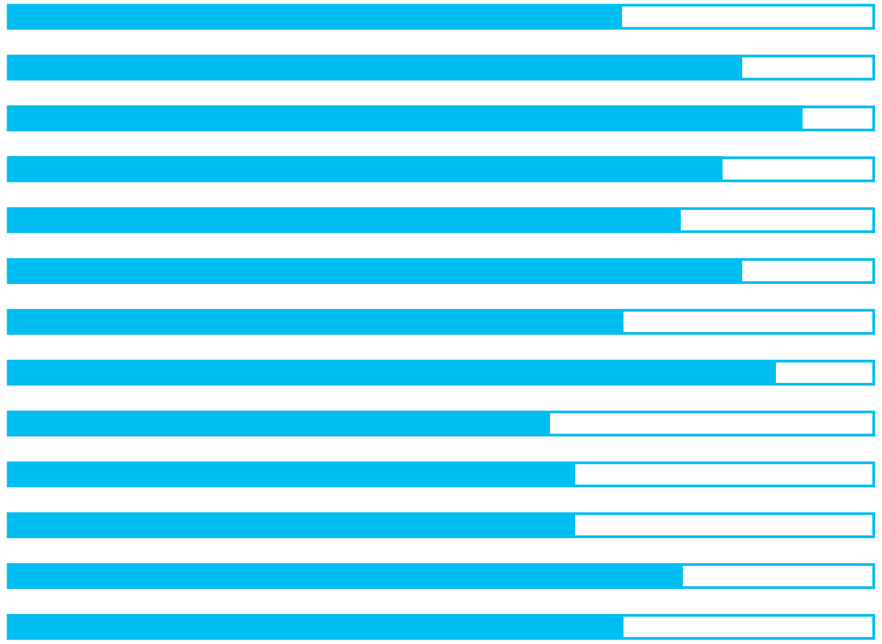
The company she works for uses the Dassault Systèmes' solutions. She uses the **3DEXPERIENCE** platform and its 'Mechatronic Systems Engineer' role to leverage the power of the platform to rapidly develop, simulate and validate complex mechatronic systems for her company. Mechatronics Model-Based Design engineering (MBDE) can provide realistic virtual machine prototyping, optimizing design to reduce raw materials and cut production time. By using virtual machines, engineers can save the company huge expenses in development costs, while reducing its carbon footprint and environmental impact.

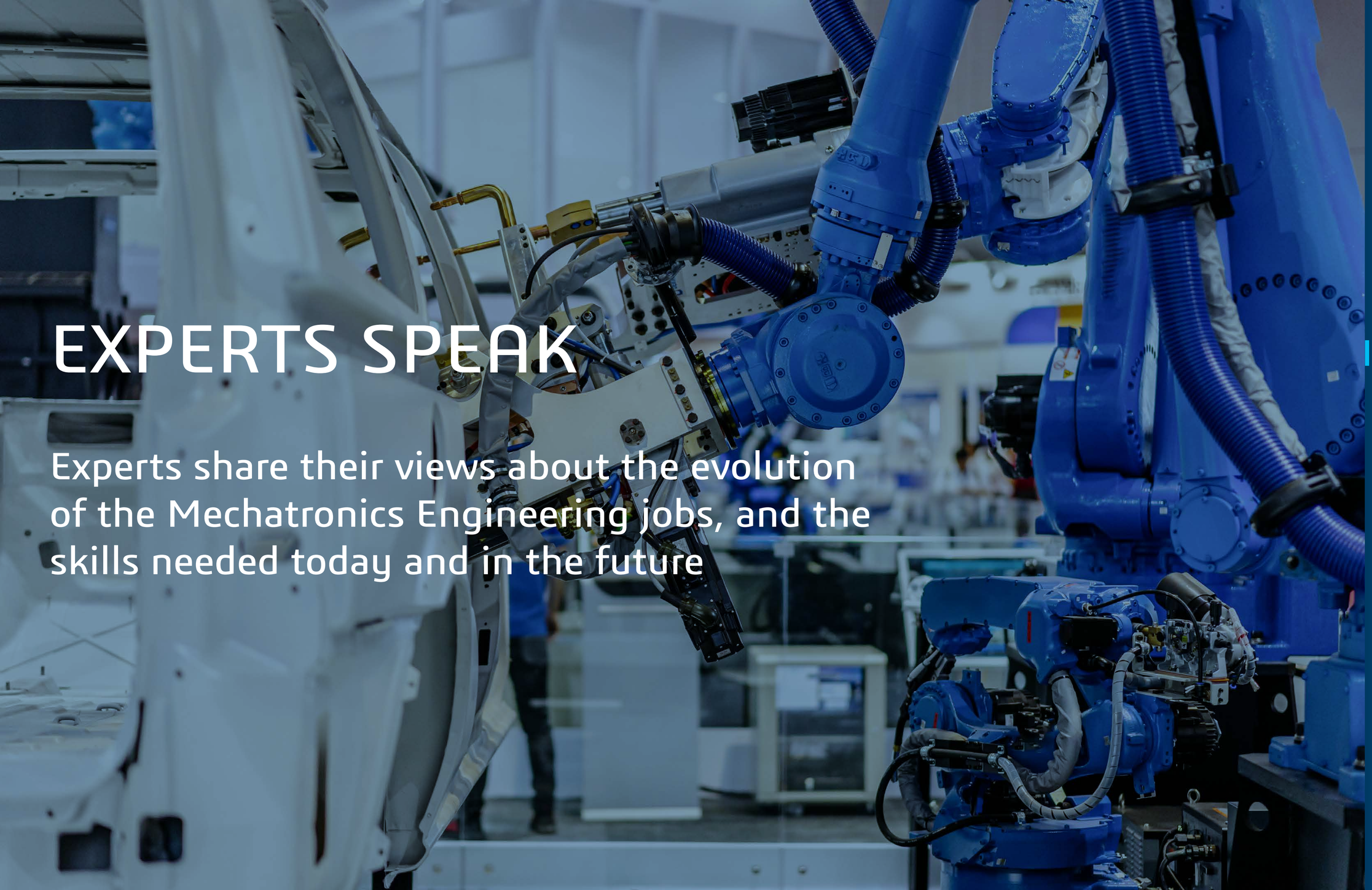
Diane's missions

- Lead integration of electrical and electronics systems for the energy recovery of electric or hybrid vehicles, and thermal vehicles
- Define the mechatronic/electronic components requirements, by analyzing her customer specifications
- Design CAD models and develops automated systems and components (prototypes, Hands-on, circuit boards)
- Develop solutions to revise or add features to the appropriate Mechatronics component
- Write specifications on the braking systems (including test plan)
- Conduct quality control analysis
- Perform Failure Modes, Effects and Criticality Analysis (FMEA)

Diane's skills

- Software Engineering
- Electronics
- Robotics
- Systems Engineering
- Model-based design
- Electrical engineering
- Automation
- Mechanical engineering
- **3D**EXPERIENCE
- Decision-making
- Complex problem-solving
- Creativity & Innovation
- Collaboration





EXPERTS SPEAK

Experts share their views about the evolution of the Mechatronics Engineering jobs, and the skills needed today and in the future

Denis Philippe

Mechatronics Program Coordinator,
EIGSI Engineering School, France

Denis Philippe teaches Mechatronics at EIGSI and is in charge of the Mechatronics Master's program.

As an academic expert, he shared his view of the Mechatronics jobs and discipline with us. Denis says there is no singular definition for Mechatronics and the latest may vary depending on the curriculum.

At EIGSI, they started to introduce a Master's in Mechatronics, a 360-hour curriculum, 10 years ago. Mechatronics is "a process aimed at integrating Mechanics, Electronics, Automation and Computer Science into product design and manufacturing in order to increase and optimize its functions.

"The objective of our program is to train multi-skilled systems engineers capable of analyzing a system to develop each of the components of the product by making relevant decisions throughout the project. They should also be able to master interactions between interconnected disciplines such as Electronics, Computer Science, Automation, Optics, Materials, etc." Finally, those engineers should also use problem-solving to address several industrial challenges, from both product and process standpoint", Denis concludes.

In the industry, Mechatronics enables engineers to design, simulate and analyze systems that require a high level of integration, which highlights the importance of skilled engineers.

Denis also states that Transportation industries, such as Automotive and Aerospace, and Life Science (Medical robotics) are more frequently requesting professionals with Mechatronics skills. "Mechatronics discipline is attracting more and more profiles," he says.

At EIGSI, 10 years ago, only 10 students were attending a Mechatronics master. Today, it is 4 times more. Mechatronics jobs are definitely key jobs for the future!

> **Mechatronics discipline is attracting more and more profiles.**

Christophe Chanvillard

Mechatronics Discipline Leader,
Schneider Electric, France

Christophe is a Mechatronics Discipline Leader and has a background in Electronics. Schneider Electric defines Mechatronics as "the activity that mixed skills in electronics, software, algorithmic and mechanics in a single product. It allows optimizing a strong physical and functional integration, with the help of tools to facilitate co-design and modeling", Christophe says. The Mechatronics discipline enables breaking the silos: "Mechatronics is about integrating technological innovations in a single solution for satisfying our customers." He further explains, "once there are embedded electronics into a product, there are advanced functions adding to core mechanics, so there is Mechatronics inside."

According to Christophe, Mechatronics stands at the connection of many other jobs. Consequently, there is no standard Mechatronics job and there are a lot of occupations opening up behind it. Each company can use or create its own definition of mechatronics. At Schneider Electric, they used to split mechatronics discipline around five main profiles.

The first profile is the Mechatronics leader: he or she is a technical project manager and advanced expert. It's a difficult profile to hire. The leader needs to have a multidisciplinary background as he or she must understand all the technologies implemented in his project, so he or she can work with all other third parties. He or she leads and coordinates the project and follows an approach. This is one of the most difficult profiles to recruit today because of his/her ability to deep dive into all the topics in a thorough understanding. "Those people are innovative and creative," Christophe says.

The second is composed of people in charge of the physical integration of the product. Those profiles are the referring people who know how to cope with all the constraints of physical integration. They are collaborative people with technical skills. "These people work on integrating several devices and electronic boards into one product," Christophe says. "They deal with problems of compactness, connectors, HMI interfaces, thermal constraints, coupling on EMC effects and creepage or clearance distances for voltage insulation." This knowledge requires to be skilled in 3D CAD Software and all types of ECAD-MCAD interfaces.

The third profile are engineers that integrate functions interacting between mechanics and software such as control, coil, measurement sensor or actuator algorithms. "These people are very good at using multi-physical 1D modeling software and are also very agile because they need to be able to code the mechatronic algorithms of embedded software that manage the interactions between mechanics and actuators or sensors," Christophe says. They are like Systems Engineers.

Then, there are very specialized on Mechatronics bricks in their domain. At Schneider Electric, "these people are very specialized in their domain (sensors or actuators for example) but have a mechatronics profile because they have to address problematics that come out of their domain of expertise." According to Christophe, these engineers are rare profiles who have a strong background, with more than 20 years of experiences.

The 5th profile is composed of engineers and technicians who work in labs and do tests in validation and verification phases. Their main skills are standards and tests management with a multi-physics approach.

"Smarter products for reduced cost and weight, high compacity are the main challenges of the Mechatronics Engineer job today!

Christophe says that, historically, Schneider Electric was began with Mechanics, then Mechanics juxtaposed with analog Electronics, then Mechanics with Digital Electronics embedded. Now, thanks to IoT and digitalization, they integrate the Electronics discipline more and more, and everywhere.

Digitalization creates smarter products. "The more integrated functions and the faster the networks are, the more complex the physical integration of a device is", Christophe explains. The ascent of new standards, new materials and new constraints will therefore represent new challenges for Mechatronics engineers. "There is no area that gets simplified, this is what makes the job exciting," he adds. "The basics of each job evolve so the connections between all stakeholders are more and more significant, though those connections are to be taken into consideration by engineers that collaborate all together.

"Mechatronics professionals working must have skills such as creativity, collaboration knowledge plus soft skills like complex problem solving, and analytical skills to understand the several constraints of all stakeholders," Christophe says.

Mechatronics allows Schneider Electric to drive towards sustainability: their mechatronics professionals take into consideration how their products are going to be recycled, used and reused, how to make them smarter, lighter with fewer materials, less polluted, what energy will they require and used, etc. "Overall, smarter products for a reduced cost and weight reduction are the main challenges of the job!", Christophe concludes.

Mechatronics engineers are people that provide technological answers to meet our customer needs.

Stephanie Gallardo

Mechatronics Engineer working in the Healthcare Industry, Mexico

Stephanie is a Mechatronics Engineer with a background in Robotics. She has worked for many companies such as GE Healthcare, ADT Security Systems or Rosen Group.

She graduated with a Master's degree in Biomedical Engineering, specialized in Mechatronics systems for rehabilitation.

Stephanie chose Mechatronics studies because she considered the discipline could open many doors: "The main benefit of studying Mechatronics is that it allows working either around Robotics, Automation, Machine Learning, Artificial Intelligence, Mechanical or Electrical engineering, and those disciplines are key for the future!"

"A Mechatronics Engineer thus combines the skills an electronics engineer, a mechanical engineer plus an IT engineer have, as they can ensure all these disciplines work together, anticipate the problems that arise and use all those skills to solve complex problems", Stephanie concludes.

Mechatronics brings a new way of caring people and interacting with humans.

From product design, pharmaceuticals, automation to robotics, mechatronics is everywhere. "Each year, more and more people are interested in learning mechatronics and combining mechanics and electronics skills to create new devices that help them on daily or repetitive tasks," Stephanie says. "But many companies are focusing on hiring people specialized in one area and do not know where or how the skills of a mechatronics engineer could help the company."

According to Stephanie, a mechatronics engineer should have a solid foundation in engineering and electronics, know the basics of CAD software, like CATIA or SOLIDWORKS, and be skilled enough in programming, like C or Python and be knowledgeable on digital control systems. Besides, thanks to their mixed knowledge, Mechatronics engineers can help scientists, like physicians or biologists, to create devices that mix control systems with computing skills to develop easier and smarter systems for research. Mechatronics supports the healthcare industry in smart device creation, like exoskeletons or medical device systems that can diagnose people.

She concludes with a positive closing remark, "As technology evolves and becomes more and more sophisticated, smarter systems including mechatronics will continue to grow in demand, so this will be a key job for the future."

The main benefit of studying Mechatronics is that it allows to work either around Robotics, Automation, Machine Learning, Artificial intelligence, Mechanical or Electrical engineering, and those disciplines are key for the future.

Morgan Pelissier
Chief Executive Officer, Sparkmate, an international engineering service company specialized in IoT

At Sparkmate, Morgan says he recruits candidates with multi-skilled profiles. "They all have one advanced technical skill in Software, Electronics/Embedded system, or Mechanics."

"Mechatronics is about trying to understand a complex and technical system holistically," Morgan adds. A Mechatronics Engineer is someone able to orchestrate skills such as Electronics and Mechanical engineering, plus Software engineering. According to Morgan, a mechatronics engineer is skilled in those three disciplines, but one out of the three is predominant amongst his employees. "Such engineer is not an expert in the three disciplines but is an expert in dealing with one of these," he says.

According to Morgan, technologies that transform the job today are the digital manufacturing processes, because they reduce the manufacturing time of a product. "Also, prototyping really makes the job evolving as it reduces the development cycle of our products.

Mechatronics is the future!

Being able to build a prototype is a state of mind, a know-how. The objective is to obtain concrete results quickly and for that, you need to have a large technical culture and curiosity," he adds.

Currently, Sparkmate's objective is to recruit small teams composed of specialized engineers, mastering the prototyping discipline.

Mechatronics finds its place in sustainable innovations. Overall, there is a need in all Engineering disciplines to take into account sustainable challenges, in terms of both sustainability and inclusiveness to develop better software and offer more capabilities to end-users. As an example, Mechatronics engineers use Design for Disassembly to understand the impact that they generate while creating a product and simplify it so its costs and time to market get reduced. "To create sustainable innovations, we need to have a different framework and be able to understand a problem holistically, and I do believe that mechatronics has its right place in this approach", Morgan says.

Sparkmate carries high hope in soft and interpersonal skills as those are the ones Morgan values the most in his hiring process.

A Mechatronics Engineer is someone able to orchestrate Electronics, Mechanics plus software topics at the same time to create outstanding products.

Our talents' assets? Their intertwined skills!

Théo Delétang
CATIA Electronics Roles Portfolio
Senior Manager, Dassault Systèmes

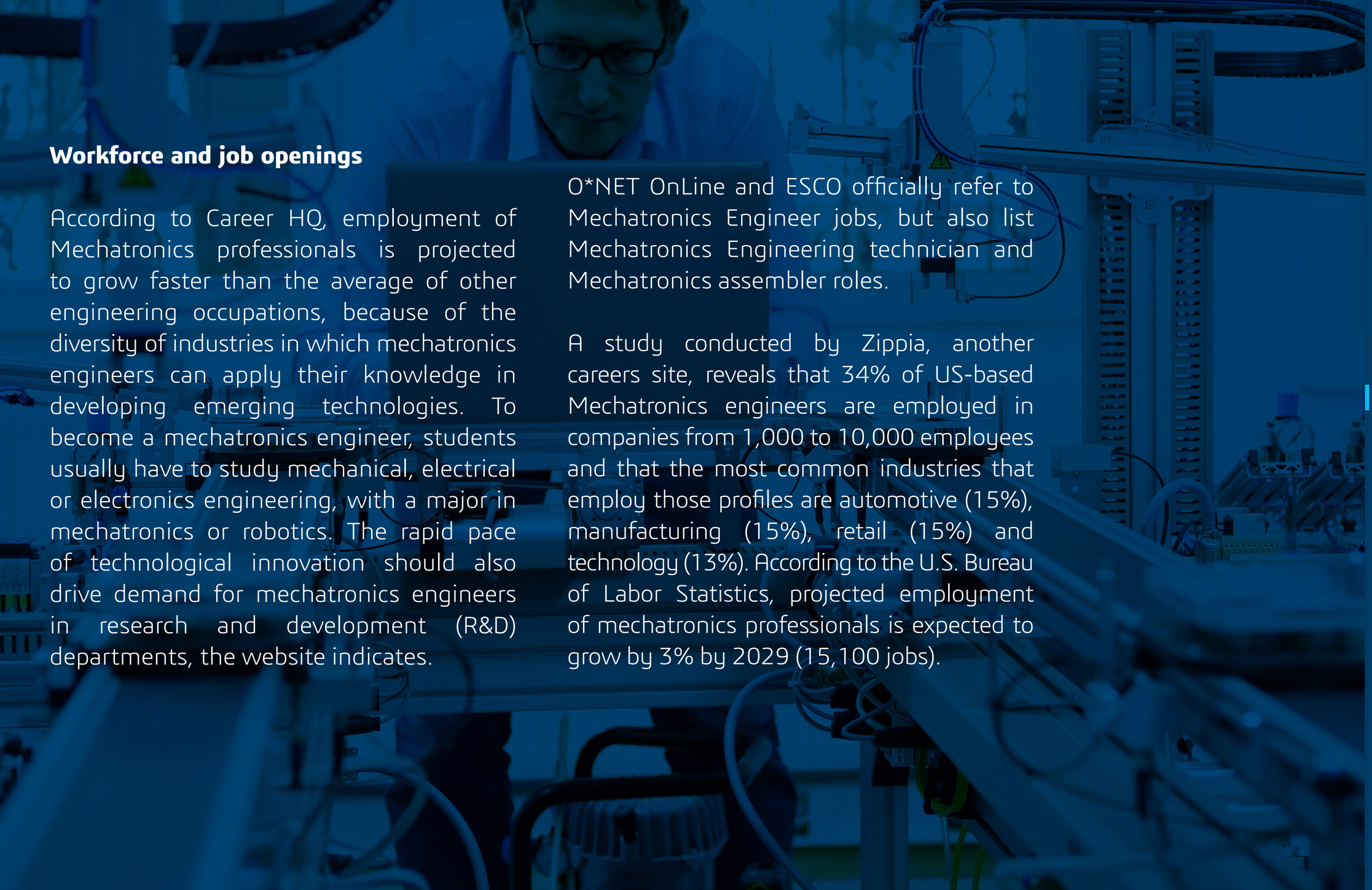
Thanks to the digitalization of many products around us, Mechatronics engineers, or overall, systems engineers will be key jobs for the future, Théo says. Indeed Mechatronics professionals can develop "smarter, safer, cheaper product improving customers value while reducing environmental impact." Mechatronics therefore meets today's industry challenges. According to Théo, the role of a Mechatronics engineer is being transformed by technology pillars: Electronics, Embedded software and Mechanics. Electronics thanks to increasing technology integration, sensor evolution and new substrates. Embedded software with the integration of algorithms that increase performance, safety and robustness and enable the connectivity. Mechanics with the increasing integration of connectors and sensors. On the tools side, multidiscipline simulation ensures the biggest part of the transformation, as Mechatronics jobs rely on simulation models.

According to Théo, a successful mechatronics engineer should have a strong background in mechanics, electronics and software engineering, plus, some strong interpersonal skills. A Mechatronics engineer not only focuses on mechanics but has got skills in several other disciplines. "Discipline engineers (Mechanics, electronics, software, system, integration test, verification test) are to collaborate more and more together, where each discipline specialist has to develop a strong understanding of the constraint of the other disciplines," he says. Therefore, Mechatronic leader became a systems leader orchestrating the disciplines and improving collaboration between all team members.

The **3D**EXPERIENCE platform provides several approaches to support mechatronics implementation, such as "systems engineering, as well as a collaborative environment that enhances collaboration between discipline specialists, and finally Electronics Mechanics collaboration (ECAD MCAD) that supports the physical interface between electronics and mechanics," Théo concludes.

Mechatronics engineers role will be key role for the future!

JOB OUTLOOK



Workforce and job openings

According to Career HQ, employment of Mechatronics professionals is projected to grow faster than the average of other engineering occupations, because of the diversity of industries in which mechatronics engineers can apply their knowledge in developing emerging technologies. To become a mechatronics engineer, students usually have to study mechanical, electrical or electronics engineering, with a major in mechatronics or robotics. The rapid pace of technological innovation should also drive demand for mechatronics engineers in research and development (R&D) departments, the website indicates.

O*NET OnLine and ESCO officially refer to Mechatronics Engineer jobs, but also list Mechatronics Engineering technician and Mechatronics assembler roles.

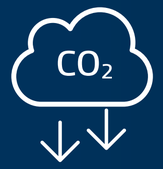
A study conducted by Zippia, another careers site, reveals that 34% of US-based Mechatronics engineers are employed in companies from 1,000 to 10,000 employees and that the most common industries that employ those profiles are automotive (15%), manufacturing (15%), retail (15%) and technology (13%). According to the U.S. Bureau of Labor Statistics, projected employment of mechatronics professionals is expected to grow by 3% by 2029 (15,100 jobs).

Key figures

Employment projection for Mechatronics professionals by 2029 in the US:

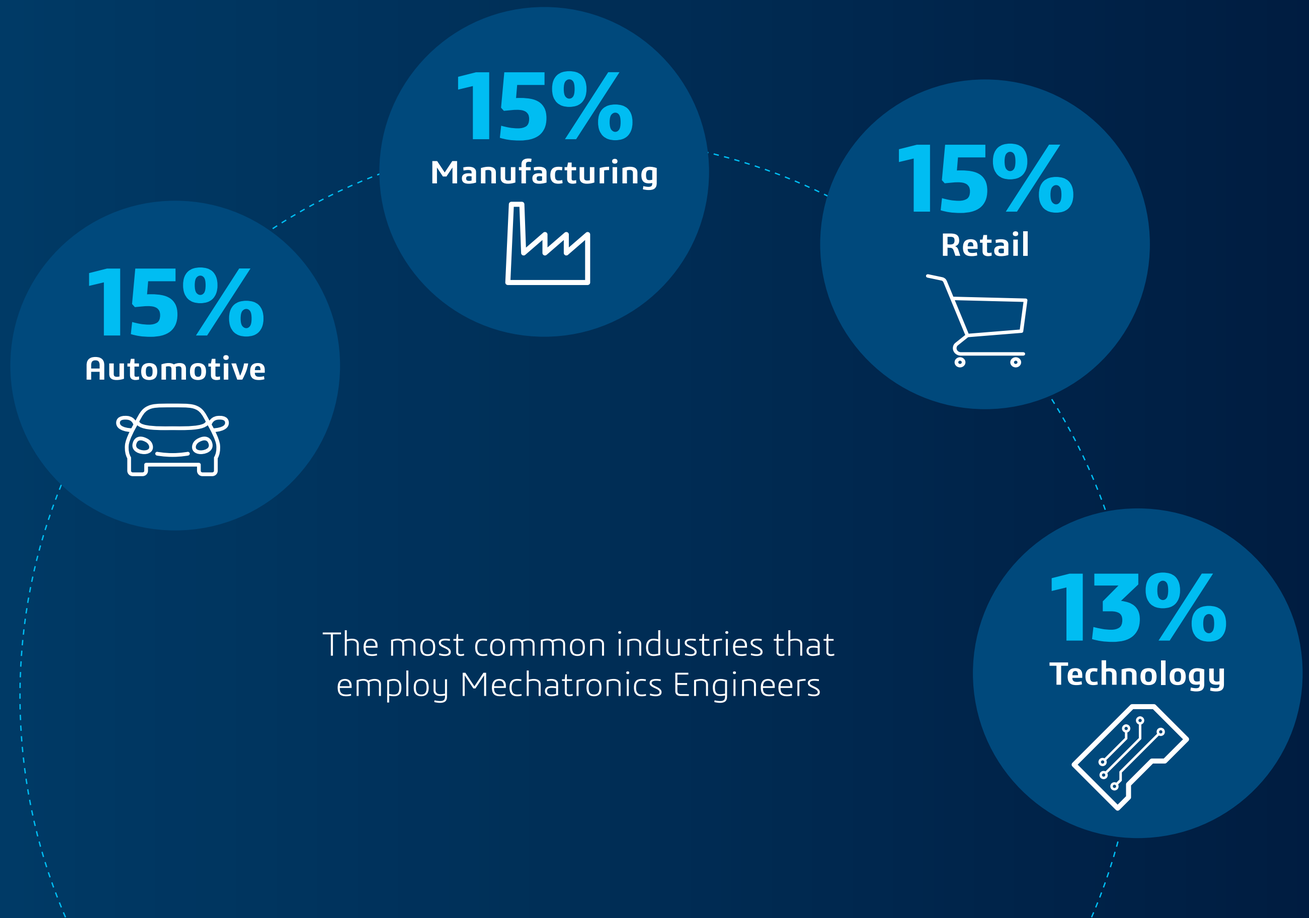
15,100

jobs



Mechatronics engineers use solutions that can create energy savings up to **90%**

The most common industries that employ Mechatronics Engineers



In addition, ESCO references alternative labels for this job, like Mechanical systems engineers, mechatronics engineering specialist, robotics engineer, electromechanical engineer, cybernetics engineers, mechatronics systems designer, etc. O*NET references the following alternative labels: Automation Engineer, Automation Specialist, Development Engineer, Equipment Engineer, Principal Engineer, Project Engineer, Senior Design Engineer, Senior Project Engineer. The US Bureau of Labor Statistics uses "Electro-Mechanical and Mechatronics Technicians" naming to talk about Mechatronics engineers.

Jobs in relation with a Mechatronics Engineer

The wide array of related job titles demonstrates the complexity of summing up a global count for Mechatronics engineers.

There are almost certainly fewer job postings labeled "mechatronics engineer," because mechatronics is more used as a required skill on the job offering market. Indeed, ESCO, O*NET and EMSI do reference "Mechatronics" skill in their referential.

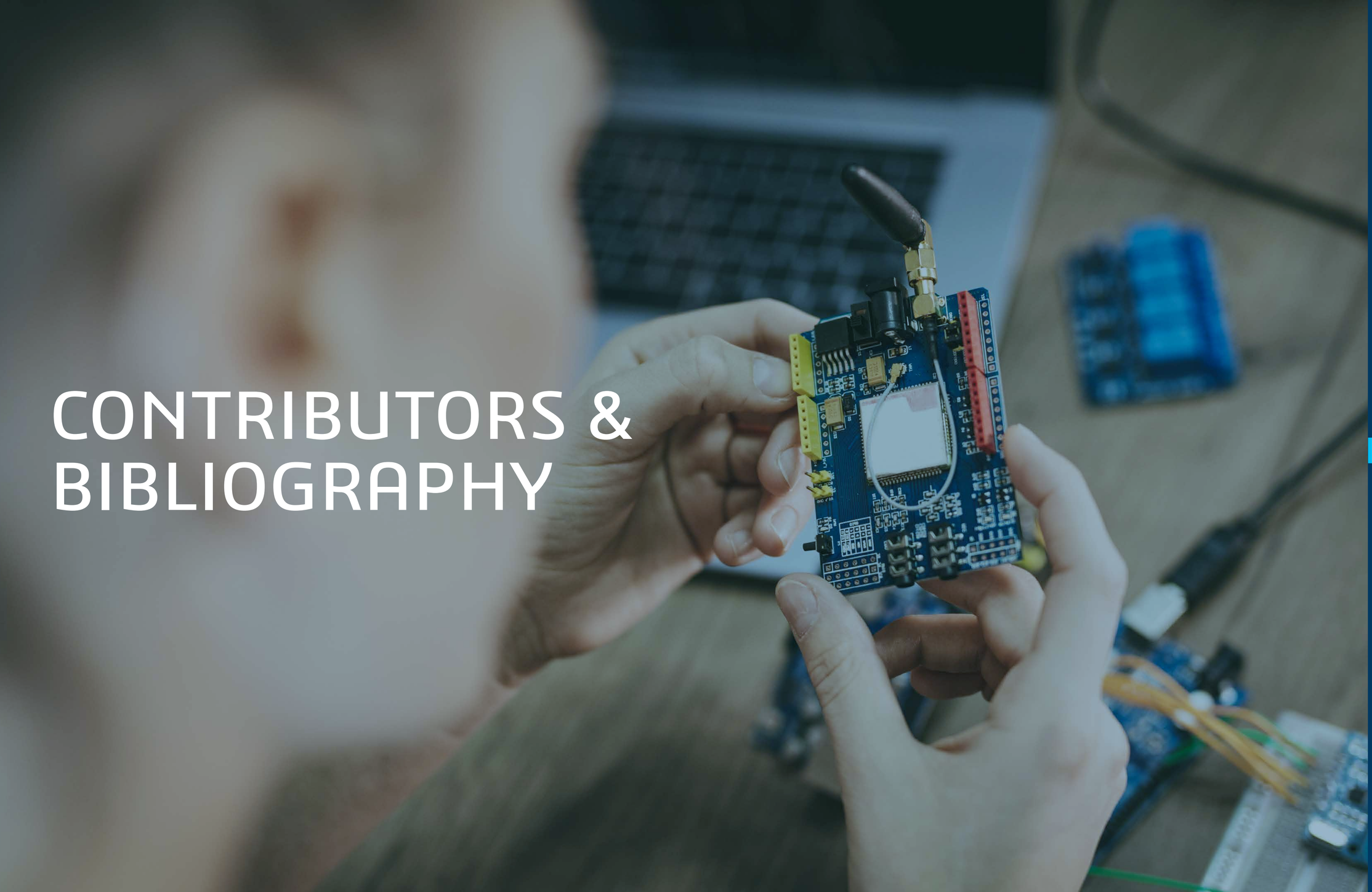
Education

There is a need to develop interdisciplinary mechatronics educational degree programs that can prepare graduates to effectively think, create, design, lead, build and maintain the products and systems of today and tomorrow. There is a need to prepare engineers who are proficient in both systems design and mechanical, electronic and computer-based control. Graduates of mechatronics programs should be able to develop high-value-added products of mechatronics nature and have the rights skills to work on interdisciplinary projects. They should collaborate effectively as a team member across disciplines on mechatronical projects be are able to solve complex and large-scale problems from a systems perspective.

The increase of educational institutes that promote mechatronics learning and development demonstrates a growing demand for mechatronics and robotics courses. Education in mechatronics is a relatively new discipline in engineering education.

Mechatronics programs at undergraduate and graduate levels are becoming more popular and thriving in Europe, Asia and America. Program titles to learn mechatronics contain several terms, such as "automatic," "robotics," "electronics," "automation," "systems engineering." Many engineering schools have reoriented their mechanical engineering specialties towards mechatronics to meet the industry needs such as "Mechatronics and Systems specialty" at Engineering EIGSI School in France, Mechatronics Engineering Master at Zhejiang University or Master's degree in Mechatronics and Robotics at New York University.

3 examples of Master's Degrees with Mechatronics programs



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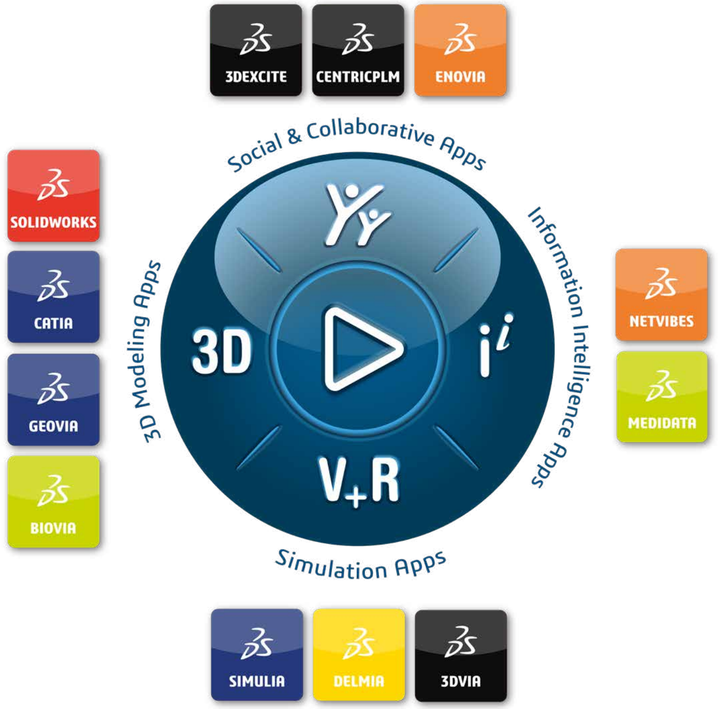

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