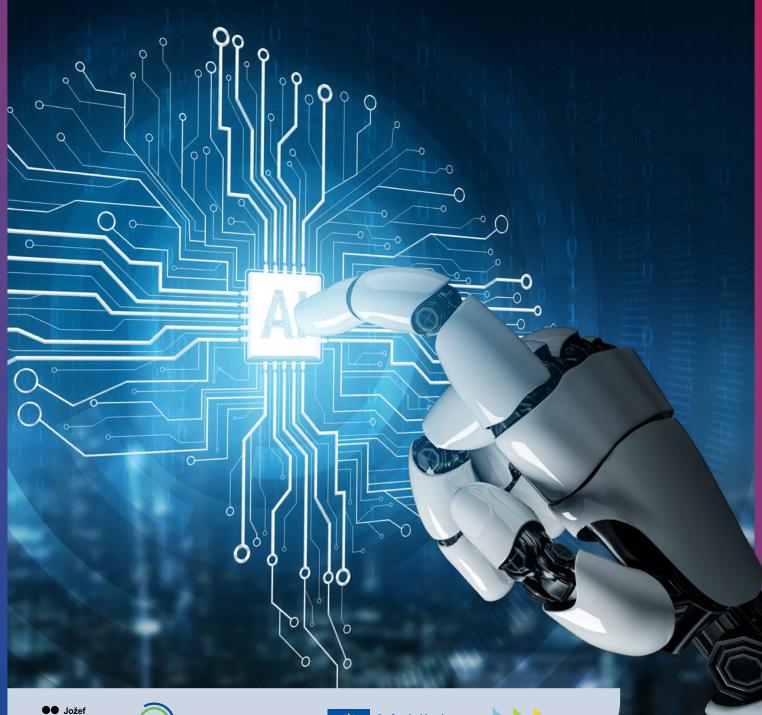
INNOVATION DAY LJUBLJANA

Robotics & Manufacturing











INNOVATION DAY LJUBLJANA ROBOTICS AND MANUFACTURING

Ljubljana, Slovenia, 2022









Publication: Innovation Day Ljubljana - Robotics & Manufacturing

Publisher: Jožef Stefan Institute

Lead editor: Martin Bem, mag. inž. str.

Concept, design, print: MARIDEA, communication and marketing services

Images: Jožef Stefan Institute archive, participating companies' and organisations' archives, photographers Arne

Hodalič and Katja Bidovec, Uroš Zagožen

Number of copies: 200

Price: free

Ljubljana, December 2022

Innovation Day Ljubljana - Robotics & Manufacturing is an international event in the field of robotics and manufacturing, aimed at both the research & innovation and industrial audience in Europe. The event was organized in collaboration between the Jožef Stefan Institute, EIT Manufacturing and SRIP FoF and was held first at the Union Hotel in Ljubljana and then at the Jožef Stefan Institute in Ljubljana, Slovenia.

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I Kazalo

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Don't think of robots as replacements for humans - think of them as things that will help make us better at tackling many of the problems we face.

Eoin Treacy, career analyst, writer, strategist, commentator, lecturer and fund manager









I Preface

With its numerous manufacturing companies, Slovenia belongs to the family of highly industrialized countries. This is reflected in its strong integration into European and global production chains and markets. In particular, the sector of suppliers to the automotive and electrical industries or, for example, niche sectors of the rest of the manufacturing industry stand out as trustworthy partners. That is why the academic and industrial sectors in Slovenia have flirted with automation and robotics from the very beginning, which is reflected today in high-quality education and strong scientific research groups at institutes and universities. The personnel coming from these institutions are key to encouraging and pushing innovation in many existing and start-up companies in this field.

We are pleased to present a part of this attractive area in the whole knowledge triangle with the international event "Innovation Day Ljubljana - Robotics and Manufacturing", which we are organizing at Jožef Stefan Institute in cooperation with EIT Manufacturing and Strategic Research Innovation Partnership (SRIP) Factories of the Future. It is the knowledge triangle that is recognized throughout the EIT community as the foundation for a competitive, knowledge-based economy capable of sustainable growth and is presented in the brochure to the wider professional and other public.

The Industry 5.0 paradigm emphasizes the key role of people in the production process. In Slovenia, we have already responded effectively to this in the past with the Young Researchers Program, a long-term, sustainable, and government-funded program that has also produced experts in robotics by developing talents, and we continue to strongly support this program. Slovenia is above the European average in the introduction of robots in manufacturing per capita. According to the IFR



statistics, the number of introduced robots at suppliers of the automotive industry is even better. In the brochure, we, therefore, highlight the themes of the event, such as education, innovative work of researchers, the European manufacturing innovation ecosystem, the transfer of breakthrough ideas to create new companies, a vision of the production of robots and components for them, and integration of robotics technology into a variety of industrial processes. Here, in addition to the golden Slovenian gazelle such as the company RLS Merilna tehnika, we highlighted also the Slovenian branch of the robot manufacturer Yaskawa as a story about the successful introduction of high-tech companies in Slovenia, which is also presented in the brochure. We are aware that in the future, well-trained and qualified personnel and production in the home location will be crucial. Therefore, we want to inspire many young people, especially women, for engineering and technology and have dedicated a special place to this at the event.









The SmartFlexCell innovation project is presented in the brochure as an example of good pan-European cooperation in the transfer of innovative robotics technology from research institutions through the creation of a new spin-off integrator company to industrial end users in line with the go-to-market strategy prioritised for EIT projects. The representatives of the project and the participants of the round table from the automotive and aircraft industries, who discussed the need for personalization of production with high flexibility aspects, are presented in the brochure.

In the brochure, we present institutions and companies that have actively participated in three key areas:

- presentation of the final results of the EIT Manufacturing innovation project SmartFlexCell,
- European innovation ecosystem
 EIT Manufacturing,
- performance of robotics research and innovation with the presentation of robotics manufacturers and integrators in Slovenia.

EIT Manufacturing is briefly described in the brochure as the largest manufacturing innovation ecosystem in Europe. The event in Ljubljana presented the strengthening of the EIT Manufacturing idea and the building of an EUwide community. At this event, we specifically targeted industries in the eastern part of the EU. Various opportunities were presented for companies of all sizes, universities and research institutions on how organizations can benefit from this network. A panel discussion with companies from the EIT Manufacturing network in the

region and a session of start-up pitching concluded the program in this part. Some of the actively participating companies are also featured in the brochure.

The last part of the event took place at the Jožef Stefan Institute and was dedicated to the presentation of robotics research and innovation with the presentation of robotics manufacturers and integrators in Slovenia. The brochure presents the research and development work and innovations of Jožef Stefan Institute, the University of Ljubljana and the University of Maribor, followed by descriptions of companies Yaskawa and RLS Merilna tehnika. A special chapter is dedicated to the presentation of Slovenian robotics integrators. SRIP Factories of the Future as a cluster currently unites 100 members from industry and other sectors in Slovenia. Among others, many robotics technology integrators are members who are connected in an organised way with other actors within SRIP Factories of the Future as well as with other SRIP-s in Slovenia in the fields of mobility, materials, smart cities and communities, medicine, food, wood chain and smart home, and circular economy, representing regional opportunities and synergies in the field of robotics in Slovenia. In the end, the participants also visited the robotics research laboratories of the Jožef Stefan Institute.

With the event, we try to achieve the main goal, which is the exchange of knowledge, experience and information in the field of robotics and manufacturing in a larger regional environment with an exposed component of interconnection and networking, for the well-being of people living and working in this region. Many thanks to all participants and sponsors for making the event in Ljubljana a success.

Asst. Prof. Dr. Igor Kovač, Jožef Stefan Institute











I Jožef Stefan Institute

The Jožef Stefan Institute is the leading Slovenian scientific research institute, covering a broad spectrum of basic and applied research. The staff of more than 850 specializes in natural sciences, life sciences and engineering.

The Jožef Stefan Institute is named after the distinguished 19th century physicist Jožef Stefan, most famous for his work on the Stefan-Bolzmann law of black-body radiation. The subjects concern production and control technologies, communication and computer technologies, knowledge technologies, biotechnologies, new materials, environmental technologies, nanotechnologies, and nuclear engineering.

The mission of the Jožef Stefan Institute is the accumulation - and dissemination - of knowledge at the frontiers of natural science and technology to the benefit of society at large through the pursuit of education, learning, research, and development of high technology at the highest international levels of excellence.

The Institute was founded in 1949 at a time when scientific research was expanding rapidly throughout the world. Initially established as an institute for Physics within the Slovenian Academy of Sciences and Arts, it is today involved in a wide variety of fields of both scientific and economic interest. After close to 60 years of scientific achievement, the Institute has become part of the image of Slovenia. The basic goals of the Institute are to provide expert scientific and applied output in the form of processes, products and consultancy, and to produce well-trained young scientists.



The underlying philosophy is that these objectives can be achieved only if based on international-class scientific research. With this in mind, the in-house research has been reinforced by building strong links to universities, other research institutions and industry. The Institute is closely connected with Slovenian universities, where many scientists who initially developed their research talents at the Institute have been appointed to teaching posts, while still retaining their research positions or research teams at the Institute. Since 1985 more than 800 postgraduate students have gained their MSc. and PhD degrees at the Institute. Close contacts are also maintained with secondary schools, providing work practice on research projects in natural sciences and organising regular visits to the laboratories.

In 1995 the Nova Gorica Municipality and the Jozef Stefan Institute founded the first private postgraduate school in









Slovenia, the Nova Gorica Polytechnic. This school has developed in the fourth Slovenian university, providing courses in many scientific fields. In collaboration with a group of leading Slovenian industrial organisations, in 2003 the Institute founded The Jožef Stefan international postgraduate school. As part of its support for applied research in the field of ecology, the Institute is one of the founders of ERICo Velenje, the Institute for Ecological Research.

The Jožef Stefan Institute is the leading Slovenian research organisation. It is responsible for a broad spectrum of basic and applied research in the fields of natural sciences and technology. The staff of around 800 specialize in research in physics, chemistry and biochemistry, electronics and information science, nuclear technology, energy utilization and environmental science.

As a co-founder of the University of Nova Gorica and the Jožef Stefan International Postgraduate School the Institute is also very involved with the university education. In 2006 a long-term cooperation agreement with University of Ljubljana and University of Primorska was signed.

has resulted in the development of medical equipment (tomography, electrical stimulators and appliances), the provision of isotopes for clinical research and treatment of patients, and the introduction of new research techniques and diagnostic methods into clinical medicine. The Jožef Stefan Institute and the Valdoltra Orthopaedic Hospital founded the Research Institute Valdoltra, which is now an independent institution.

Being well aware of the international nature of science, the Institute has devoted considerable efforts to international cooperation. Today it co-operates with many leading scientific research institutions worldwide.

The Institute devotes a considerable amount of effort to transfer the results of its research and knowledge to produce applications and to the market. It was in this context that some years ago, the Technology Park was established at the Jožef Stefan Institute. This was the predecessor of the Ljubljana Technology Park, whose founders are the Institute, Helios, the Institute for Biology, IskraTEL, the Chemistry Institute, LEK, SKB Banka and the Technological Development Resource Centre. The Technology Park currently includes seven private companies, whose staff derive from the Institute's research staff and elsewhere. Their products, technologies and services have been developed within research or application projects over the past few years. The Park supports the creation and growth of new enterprises based on the results of research from Slovenian universities and international institutes. The Institute actively makes use of this support for hi-tech enterprises to create an environment in which innovation, financing and production interact to accelerate the cycle of development of innovative products.

Prof. Boštjan Zalar, Ph. D. Director Jožef Stefan Institute













I EIT Manufacturing – the largest innovation community for manufacturing in Europe

EIT Manufacturing is one of the nine knowledge and innovation communities supported by the European Institute of Innovation and Technology (EIT), a body of the European Union. EIT Manufacturing's vision is that global manufacturing innovation will continue to be led by Europe. To reach this ambitious goal, EIT Manufacturing brings European stakeholders focused on manufacturing together in innovation ecosystems that add unique value to European products, processes and services and inspire the creation of globally competitive and sustainable manufacturing. EIT Manufacturing works along the so-called knowledge triangle, integrating the areas of Innovation, Education and Business Creation, and connects more than 80 leading actors in the manufacturing domain across research, business and academia to drive innovation and support the development of new technologies and solutions. Additionally, the Regional Innovation Scheme (RIS) - the EIT community's outreach programme to strengthen the innovation performance of countries classified as modest or moderate innovators - offers various initiatives to foster innovation in the targeted countries.





While EIT Manufacturing is headquartered in Paris, France, six innovation hubs, so-called Co-Location Centers, directly support their partners and ecosystem stakeholders on a regional level. Their offices are located in Darmstadt, Germany (Central), Vienna, Austria (East), Gothenburg, Sweden (North), Milan, Italy (South), Athens, Greece (South-East), and San Sebastian, Spain (West). In addition, EIT Manufacturing works together with local organisations that act as regional representatives in many European countries. These hubs help EIT Manufacturing to better connect to the local manufacturing ecosystems and to support stakeholders with individualised services.

MAKING INNOVATION HAPPEN

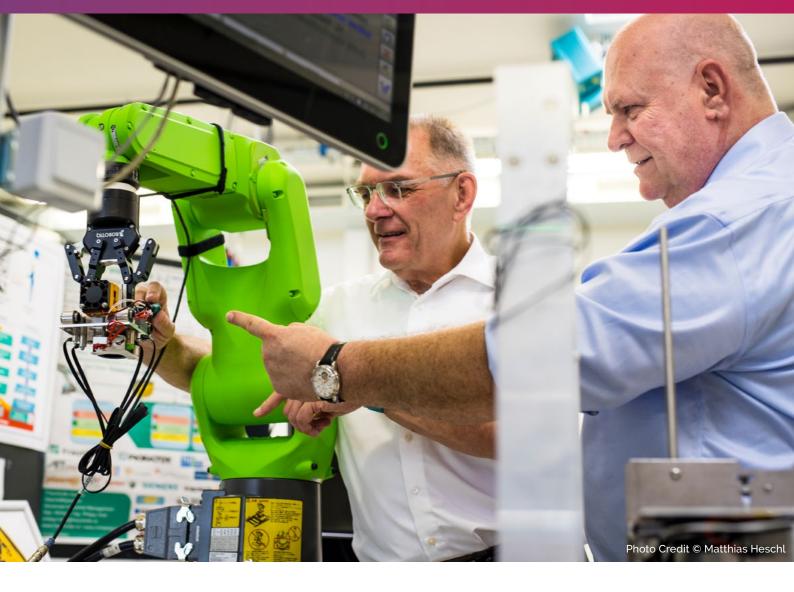
EIT Manufacturing helps manufacturing companies in Europe to become greener, more sustainable and resilient and to find innovative solutions to their most pressing challenges: the transition towards a circular economy,











digitalisation and towards the decarbonisation of industry. Through its innovation activities, EIT Manufacturing supports European consortia to execute innovation projects that aim to solve real industry problems and fill innovation gaps and bring these new solutions to the market. In the area of Education, EIT Manufacturing offers Master and Doctoral Programmes together with its partner universities, as well as specialised training programmes on its learning platform Skills.move for up- and reskilling manufacturing workforce. As start-ups are an important part of every industry domain and vital for a society's economic growth, EIT Manufacturing engages with and actively supports industry start-ups and scale-ups in Europe to help them to access new markets or to find business partners.

Visit our website to learn more!

www.eitmanufacturing.eu

Contact us!

east@eitmanufacturing.eu













I SRIP FoF - Strategic Research and Innovation Partnership of the Factories of the Future

Within the framework of the Strategic Research- Innovation Partnership Factories of the Future (SRIP FoF), the main objective is to bring together Slovenian research and industry. Together we are identifying breakthrough products, services and technologies for the factories of the future. This will create the possibility of efficient production at home, enabling competitiveness and further development in the global economy.

We create a supportive environment with professional services for industry and research institutions that address future human resource challenges. In this way, we ensure rapid knowledge transfer to industry and new content for the education system.

The SRIP FoF works on the following priorities:

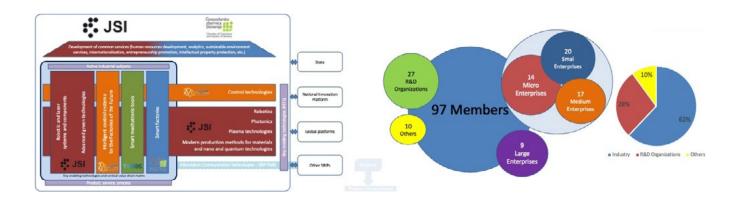
- · robotic and laser systems and components,
- · advanced green technologies,
- · intelligent control systems for the factories of the future,
- smart mechatronic tools and
- smart factories.

In addition, we are working on five key enabling technologies:

- · robotics,
- · control technologies,
- photonics,
- plasma technologies,
- modern production methods, and nano and quantum technologies.

Visit our website to learn more! *ctop.ijs.si*













We're not going to see an exclusively robotic factory, but we will see the optimum use of robots and people.

Dennis Muilenburg, former CEO of The Boeing Company

l Yaskawa

YASKAWA IS THE PROUD MAIN SPONSOR OF THE INNOVATION DAY LJUBLJANA - ROBOTICS & MANUFACTURING.

Yaskawa started a successful journey in Slovenia in 1990 with a small group of young engineers. In 1996 Yaskawa decided to start an engineering operation in Ribnica, which would act as a solution provider and integrator with Yaskawa robots, supported by a team of 160 devoted employees, including a strong group of over 50 highly-skilled engineers.

The company acts as a supplier of robotics and automation of work processes in the industry. With 30 years of

experience in the Slovenian market, countries of former Yugoslavia and all over the EU, we have a wide range of implemented solutions in various fields of automations, always introducing new scientific achievements in the development and production of industrial robotic technologies. That is why Yaskawa Electric Corporation Japan entrusted us with the design of the first robot factory in Europe. The new Slovenian factory "Yaskawa Europe Robotics" in Kočevje is the first factory that manufactures robots for the needs of the EMEA region.



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YASKAWA Europe Robotics d.o.o. Novomeška cesta 10 1330 Kočevje, Slovenia

www.yaskawa.si ysl-info@yaskawa.eu.com













Production started in November 2018, with 155 highly-skilled employees, with the plan of manufacturing 5,000 robots and reaching approximately 50 mio EUR yearly turnover by 2022. The planned maximum production capacity is up to 10,000 robots per year.

Yaskawa European Robotics is part of the Yaskawa Electric Corporation, a leading robotics manufacturer that produces more than 40,000 industrial robots annually and has over 500,000 industrial robots, 10 million servomotors and 18 million inverter motors involved in various production processes. It is engaged in developing technological solutions for the automotive industry, metal processing, casting industry, food industry, construction, furniture industry, medicine and cosmetics. With a constant implementation of new technologies, four quadrant operating inverter motors, solar and

well-balanced energy-saving technologies, all included in the strategy of I cube mechatronics, Yaskawa is putting lots of effort into establishing a clean and sustainable future.

















I Jožef Stefan Institute – Department of Automatics, Biocybernetics and Robotics

Jožef Stefan Institute is the leading Slovenian scientific research institute, covering a broad spectrum of basic and applied research. The staff of about 1050 specializes in natural sciences, life sciences and engineering. The subjects concern production and control technologies, communication and computer technologies, knowledge technologies, biotechnologies, new materials, environmental

technologies, nanotechnologies and nuclear engineering. The mission of Jožef Stefan Institute is the accumulation - and dissemination - of knowledge at the frontiers of natural science and technology to the benefit of society at large through the pursuit of education, learning, research and development of high technology at the highest international levels of excellence.









The research within the department of automatics, biocybernetics and robotics combines the fields of robotics (including intelligent control, robot learning, humanoids, exoskeletons, cognitive robotics and industrial robotics), factories of the future, biomechanics, kinesiology, ergonomics and environmental physiology. By combining engineering and life sciences, we were able to make significant contributions to the development of new methods for robot skill learning, human-robot physical interaction, including shared control in exoskeletons, a planetary habitat simulation facility, advanced humanoid and reconfigurable robotic systems and manikins enabling the evaluation of protective garments for industry and recreation. Our aim is to create robots that are capable of acquiring new knowledge through learning and can collaborate with people in a natural way, which is essential for bringing robots to new application domains.

BUSINESS CARD

Jožef Stefan Institute Department of Automatics, Biocybernetics and Robotics Jamova cesta 39 1000 Ljubljana, Slovenia abr.ijs.si e1-tajnistvo@ijs.si













I University of Ljubljana, Faculty of Electrical Engineering, ROBOLAB

Robolab has long-standing excellence in the field of human-machine motion analysis, artificial and natural motor control, and psychophysiological measurements. The group has a good track in robotics research and applications in clinical and industrial settings.

Robolab members work on innovations and the development of novel robotic devices and solutions for diagnostics and training in rehabilitation and sports. Sophisticated motion coordination between humans and robots is the common denominator of research on exoskeletons.









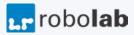
bionic prostheses and advanced human assistance systems. Technologies for haptic human-machine interfaces, wearable motion and psychophysiological sensors also appear in combination with virtual reality.

Robolab provides Slovenian industry with a competitive advantage by advancing robotics technology for industrial users. Several complex assembly robot cells and solutions have been developed, including a large-scale robotic telescopic handler for the construction industry and the Advanced Robotic Cell for quality control. The Collaborative Robotic Centre, established within the Robolab, is a bubbling space between academics, students and industry.

One of the study programs at the Faculty of Electrical Engineering is also the Master in Robotics, the only one in Slovenia since its beginnings 35 years ago.

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University of Ljubljana Faculty of Electrical Engineering Tržaška 25 1000 Ljubljana, Slovenia www.fe.uni-lj.si www.robolab.si















I University of Ljubljana, Faculty of Computer and Information Science

The Faculty of Computer and Information Science of the University of Ljubljana is Slovenia's leading educational and research institution for computer and information science.

The faculty's main function is educating undergraduate and graduate computer science experts of various profiles, as well as engaging in research work which generates new knowledge and uncovers solutions to contem-









porary problems. Faculty members cover the entire field of computer and information sciences, however the work on artificial intelligence is the most prominent one.

The faculty also offers a master's degree in Data Science, with a particular focus on various aspects of AI. Several laboratories are involved in research in different areas of AI, from machine learning to computer vision. One of them is the Visual Cognitive Systems Laboratory which is very active in developing novel vision-based intelligent solutions for the factories of the future. The laboratory is involved in basic and applied research of visually enabled intelligent systems. Their research interests include computer vision, deep learning, and cognitive robotics. Their extensive research and applied experience have been accumulated in collaboration with a wide range of partners in a number of EU, national and industry-funded projects on these research topics.

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University of Ljubljana Faculty of Computer and Information Science Visual Cognitive Systems Laboratory Večna pot 113 1000 Ljubljana, Slovenia fri.uni-lj.si prof. dr. Danijel Skočaj danijel.skocaj@fri.uni-lj.si

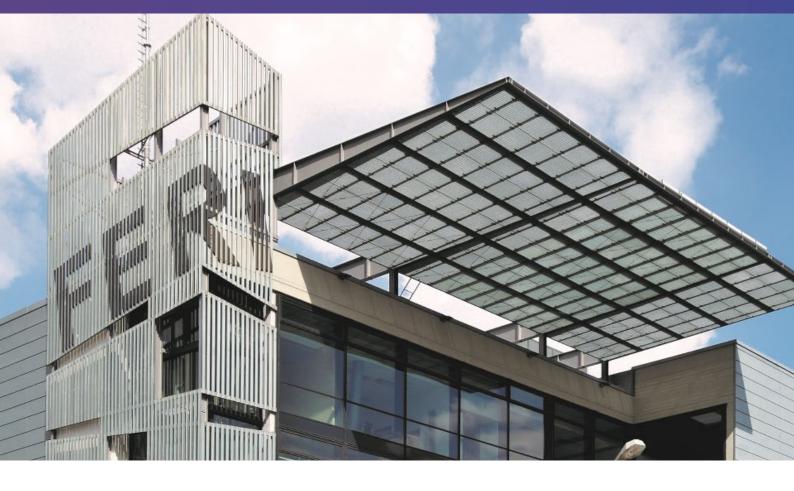












I University of Maribor, Faculty of Electrical Engineering and Computer Science

The Faculty of Electrical Engineering and Computer Science at the University of Maribor (UM FERI) is one of the leading teaching and research institutions in the field of electrical engineering and computer science in Slovenia. It provides students with knowledge based on internationally recognized scientific research, enabling them to successfully integrate into future working environments in Slovenia and/or abroad.

UM FERI is the largest faculty at the University of Maribor with about 2200 full-time students, more than 600 first-year students, more than 300 foreign students, and 340 staff members including about 150 teachers and about 90 researchers. We offer 10 undergraduate, 7 master and 3 doctoral degree study programs in electrical engineering, computer science, informatics, media communications, telecommunications and mechatronics.









Through the plethora of them we provide students with most of the knowledge and skills required for Industry 4.0 and Robotics.

The Faculty recognizes the importance of integrating education, research and industry. Research work is conducted within 26 laboratories organized in 8 institutes. The activities related to robotics are mainly conducted within the Institute of robotics, which was established in 1981. Since then it performs R&D work in the fields of robotization, automation and mechatronic systems. In the last five years, the faculty researchers have successfully carried out more than 200 European and national projects in the areas defined by the Smart Specialization Strategy as leading or cooperating partners in international projects such as Horizon 2020, ESA, NATO SPS, COST, INTERREG, ERASMUS+. This allows our students to acquire knowledge based on internationally recognized scientific research.

BUSINESS CARD

University of Maribor Faculty of Electrical Engineering and Computer Science

Koroška cesta 46

2000 Maribor, Slovenia

feri.um.si feri@um.si



Faculty of Electrical Engineering and Computer Science















I Pipistrel Vertical Solutions

Pipistrel Vertical Solutions is the R&D division of Pipistrel. The design experience of the PVS team, counting over 100 members between researchers, engineers and rapid prototyping specialists, covers all of Pipistrel's two-seat models and the four-seater Panthera from conceptual design up to preparation for serial production including supply chain development and quality validation.

Pipistrel Vertical Solutions develops its own battery, power controllers and electric motors for small and general aviation class of aircraft and is the only company globally to have obtained EASA approval for propulsion-class batteries to be used in aviation for commercial application as part of a Type Certificate.

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Pipistrel Vertical Solutions d.o.o. Vipavska cesta 2 5270 Ajdovščina, Slovenia www.pipistrel-aircraft.com info@pipistrel-aircraft.com +386 5 36 63 873











Pipistrel is the only company in the world selling two different electric aircraft models, the Taurus Electro and the Alpha Electro and obtained from EASA the world's first Type Certification for an electric aircraft in the CS-LSA category with the VELIS Electro in 2020. PVS designed more than seven different electric aircraft and developed aircraft propulsion batteries for NASA and Siemens projects and is a holder of a Design Approval Organization certificate issued by EASA.

Pipistrel has several R&D activities in the field of aerodynamics, structures, CAD design, mechanical design, rapid prototyping, electronics design, and structural and flight testing. It has extensive experience in managing complex projects having launched over 8 types of aircraft on the market, but also demanding research aircraft like the Taurus G4 and the HY4, where the company handled structural modification and electric powertrain installation on HY4. The company is known for designing extremely energy-efficient aircraft and for its pioneering role in electric aviation - it is the only company in the world to have two different electric aircraft on the market, but also the lead partner of HYPSTAIR project, the world's most powerful hybrid-powertrain demonstrator for aviation propulsion, and of MAHEPA, the world's first project to feature two hybrids propulsion systems tested in flight side by side. Pipistrel's flight test department is achieving the first flight of a new aeroplane prototype, either developed completely in-house or co-designed, on average every 9 months.

Pipistrel is a holder of Design, Production and Maintenance Organisation Approvals as well as Type Certificates issued by EASA and more than 80 National Aviation Authorities Globally.

With key people involved in standardisation committees, i.e. ASTM F44.40, F39.05, SAE AE7-D, Pipistrel is trying to enable the future market of hybrid-electric aviation.

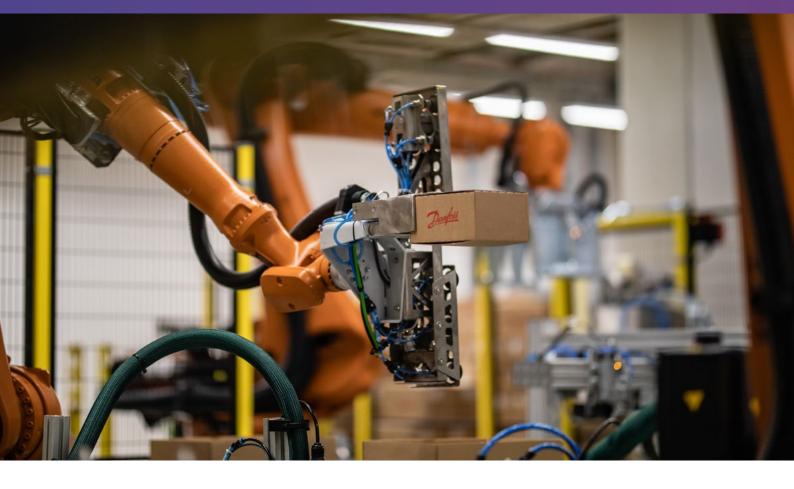
In 2022 all Pipistrel entities were acquired by the American conglomerate Textron and are now part of Textron e-Aviation. Textron Aviation division produces Cessna, Beechcraft and Hawker aircraft.











I Danfoss Trata

Danfoss Trata is a leading supplier of components for applications in district heating and cooling, as well as heating and air-conditioning control in buildings. We are experts in solutions that contribute to optimal energy use and its transfer in heating and ventilation.

We have a unique combination of know-how in the field of heating substations, controls and heat exchangers, a wide sales range and exceptional experience concerning the use of our products in various applications. All the above facts enable the development of products

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Danfoss Trata d.o.o. Ulica Jožeta Jame 16 1000 Ljubljana, Slovenia www.danfoss.si danfoss-trata@danfoss.com +386 1 58 20 200













that set the standard for the future and are coordinated with production processes.

A wish for the improvement of products and conduct of research for the development of new technologies has become a constant for the employees in Danfoss Trata, their way of life. Passion for innovation is a part of Danfoss' entrepreneurial spirit. High investments, cooperation with customers and suppliers and dedicated employees set new standards for the development of products in Danfoss.

Our largest export markets are Russia, Germany, Denmark, Poland and England. We also want to increase our presence in Asia (Korea, Malaysia and Singapore) and in Europe, Spain, France and Italy.



















I Revoz

Revoz is part of Group Renault and one of the biggest Slovenian companies, the only car manufacturer in the country and has been its No 1 exporter for several years. Revoz carries out its mission within the global automobile alliance joining Renault, Nissan and Mitsubishi. It's one of 38 plants within the Renault group, based in Novo

Mesto, Slovenia. We have over 1500 motivated employees and a 65-year tradition of vehicle production.

Our production process consists of four key standard stages, namely sheet metal transformation, assembly and welding of car bodies, paint application and

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Revoz d.d. Belokranjska cesta 4 8000 Novo mesto, Slovenia www.revoz.si info.revoz@renault.si +386 7 33 15 000











final assembly. Unlike many world-class plants, Revoz carries out all four steps on its own. From sheet metal to finished vehicle in less than 24 hours.

Every minute and a half another finished vehicle leaves our assembly lines. We use the latest robotic technology and digitalization, as well as prototyping with 3D printers. Currently, there are over 650 robots. Moreover, some parts of the production process are entirely robotized. We work with reliable suppliers and use an automated parts supply system.

Our annual production capacity of a plant is 220.000 vehicles. We had already 4.5 million vehicles delivered all over the world. Our cars are the top level of performance and quality.



- Renault Clio (5th gen)
- · Renault Twingo
- From 2020 also the electric vehicle Twingo Electric













I Domel

Domel is a global supplier of advanced solutions in the field of electric motors based on our own innovative technologies. The company, headquartered in Slovenia, was founded in 1946. Today we have around 1500 employees, more than 200 million euros in revenue, 4 production sites in Slovenia, one in Serbia and China, and

several representative offices around the world. We supply our products to all continents and our motors power now over 300 million appliances. We enable growth and sustainable development for our customers, employees, and owners.

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Domel Holding d.d. Otoki 21 4228 Železniki, Slovenia www.domel.com info@domel.com











Our main competences are:

- Motor design, Rotodynamic, Electromagnetic, Acoustics ...
- Stamping and stacking, Overmoulding, Injection moulding...
- Rapid prototyping, Motor assembly, Winding technology ...

Our dedication to innovation has positioned us as leaders in several key technology areas such as universal vacuum motors, brushless DC blowers, and brushless DC motors, including the most efficient permanent magnet synchronous motors. Domel is a development leader in the vacuum motor market. We create motors for household and industrial appliances, such as floor care machines, gardening equipment and power tools, as well as for HVAC, healthcare and medicine, the alternative energy sector and the automotive industry.













l Iskra

Iskra is a globally recognized provider of intelligent industrial solutions and top-quality electro-technical products. We are inspired by tradition, enlightened by professional knowledge, and motivated by know-how. At Iskra, we are improving existing applications and introducing new technologies in the following strategic business areas:

- · Energy sector
- Electrotechnical components
- Efficient installations
- Traffic
- Telecommunications
- Security, supply, and facility management

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Iskra d.o.o. Stegne 21 1000 Ljubljana, Slovenia www.iskra.eu info@iskra.eu +386 1 513 10 00











Throughout more than 76 years of history, we have built Iskra's name as a respected partner by supplying top-quality components, devices, innovative solutions, and effective system integration in more than 100 global markets.

Creating an environmentally friendly company is a process that requires constant improvement, investments, and innovations, so we focus on long-term strategies for making a positive impact on the environment.

Our team of experts has developed an innovative Smart Energy Meter specially designed for EV charging stations, boasting state-of-the-art features for the EV community such as a more compact design, and smart connectivity to improve energy use and delivery. Also, our WM-3M4C energy meter is fully compliant with the German EICHRECHT calibration low, enabling a more transparent measurement and billing of energy from charging stations to electric vehicles. Iskra has achieved an innovative breakthrough by implementing crypto encryption, which the WM3M4C meter has, enabling safe and reliable data transfer, and thus protecting users and managers of the charging infrastructure.

VISION

With its sustainable, innovative, and smart solutions, Iskra significantly contributes to the recognition of Slovenia as a technologically developed and creatively oriented green country. Iskra has a clear business vision and strategy for the company's development in the coming years. We want to become one of the largest Slovenian business systems and even more recognizable systems on a global level in the field of the electrical and electronic industry.

At Iskra, we believe that a secure and bright future for the individual can only be achieved through the sustainable development of society. We embed sustainability in everything we do to create long-term value. We want to further reduce our specific emissions and conserve resources while communicating our sustainability standards to our customers, suppliers, and business partners. This is where we make the biggest impact on the communities we serve, as an exemplary company wherever we do business





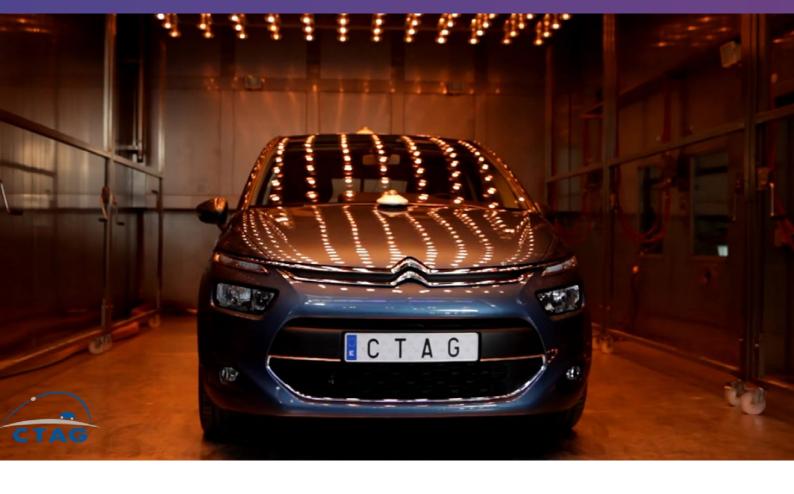












I CTAG – Automotive Technology Centre of Galicia

The Automotive Technology Centre of Galicia-CTAG is a Spanish research centre of applied technologies mainly focused on the Mobility industry.

Created in 2002, this year CTAG celebrates its 20th anniversary as one of the leading research centres in Spain.

With more than 1000 employees, CTAG works in all disciplines related to automotive:

- New Materials and Advanced Processes (Industry 5.0).
- Testing for the validation and development of new vehicles.

BUSINESS CARD

CTAG Automotive Technology Centre of Galicia Polígono Industrial A Granxa

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www.ctag.com ctag@ctag.com +34 986 900 300











- Passive Safety
- · Autonomous Driving and Electric Vehicles
- · New models for urban mobility and production systems.

In the PROCESS DEPARTMENT, new production models are under research based on 3 main strategic lines:







The hyper-flexible factory seeks new robotisation/automation solutions for incorporation into a plant.

The generation of data is transformed into information so that with the use of BIGDATA and high-capacity communications, data can be processed, and processes optimised.

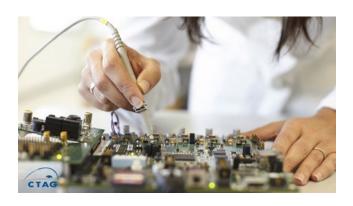
The use of exoskeletons and IoT systems will enable a connection between people and production lines, facilitating communication, improving health, reducing errors and speeding up and helping in training periods for operators.

Based on these lines and supported by an automotive factory laboratory (Booster Factory Lab) that allows the development and maturation of technologies, CTAG collaborates with STARTUPS and INSTITUTIONS to accelerate their technologies and bring them closer to the automotive industry, also including a gender perspective.

CTAG's proximity to the large industrial fabric of the region ensures that these technologies can eventually be transferred to an OEM or Tier 1.







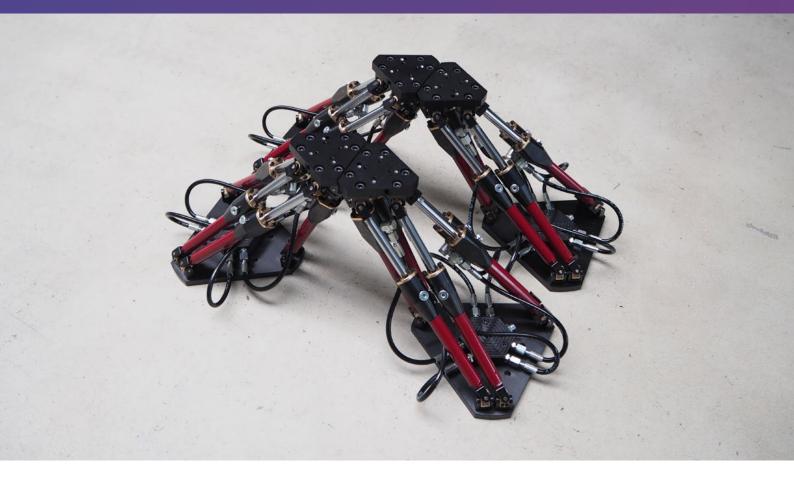












I Flex Hex

Flex Hex was founded in 2017 by three people: Igor Kovač, Miha Vrhovec, and Laurent Marquis. Laurent Marquis is actually the CEO of the company and is 100 % dedicated to the company. Igor Kovač, a professor at the Jozef Stefan Institute, is the author of the patent on the hexapod. Miha Vrhovec has a Ph.D. in Robotics from the Jožef Stefan

Institute and manages his own company Elestra, which supports Flex Hex by supplying the hexapods. Furthermore, Miha is participating actively in the development of the hexapods while Igor stays for calculation on the hexapod when new sizes are requested. Sten Hagelberg, a mechanical engineer joined the team in 2019 and holds

BUSINESS CARD

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relevant knowledge in mechanical design but also as a project leader for designing, manufacturing, and commissioning of the product at the customer place.

Flex Hex specializes in the development and commercialization of a special type of holding tool for robots in manufacturing companies – the hexapod. To manufacture items, those must be fixed on a holding tool. With the current processes, the holding tool is specifically designed for the specific item, as it has to keep the item in a precise position during the manufacturing process. Our hexapods increase significantly flexibility in production processes. In combination with production robots, the holding tool can be redesigned on the fly, by moving the hexapods to a new position, for manufacturing new items. The target group for our solution is production companies with batch or line production, where changes and switching in production requires new holding tool arrangements with high precision, i.e. assembly, construction, and welding.

Flex Hex already has customers in Denmark, Poland, and Germany. We succeeded in running a pilot plant at the BMW Group factory in the south of Germany for testing the accuracy of the hexapods for welding holding tools.

Our vision is to make the product a standard in flexible production and manufacturing, to do so, in 2021 Flex Hex developed a pilot project for a complete robotic welding cell with the financial support from WeldGalaxy. And In 2022, Flex Hex joined a consortium supported by EiT manufacturing to develop robotic flexible cells based on our hexapods for the automotive sectors for body part welding and mechanical part machining.

















I Factobotics

DEVELOPING AND COMMERCIALIZING ROBOTIC SOLUTIONS

Factobotics specializes in developing cutting-edge industrial robotic solutions, turning them into standard products, and commercializing them worldwide.

TURNING INDUSTRY CHALLENGES INTO PRODUCTS – WITH GLOBAL POTENTIAL

Factobotics is focused on identifying challenges in the industry, that can be converted into automation/robotic solutions with a global potential - having the first client

BUSINESS CARD

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FACTO-30TICS









involved as a partner right from the initial development phase although at the end having a solution applicable to the entire market segment to be addressed. We have already successfully developed and are in the market with 3 specific solutions: RoboBend - the world's first standard bending robot, Multicursor - a noncontact laser-based surface quality tool and Robo-Coup - a fixing solution for AMRs to do precise docking.

SMART FLEX CELL – WILL BE THE NEXT BIG THING IN THE INDUSTRY

Factobotics takes a leading role in the development and commercialization of the SmartFlexCell.

A unique hexapod and software technology allows you to set up the robotic cell within minutes and switch from one order to the next. The conversion of a production drawing into hexapod positions provides you with a new unique fixture with the needed tooling to initiate the next production order.

We unlock the potential for using robots for even smaller production orders in welding, machining, assembly, and more – and this will be our next big contribution to the industry.













I SaleSqueze

SaleSqueze, founded in 2021, is a fast-growing startup with headquarters in Slovenia. Its main focus is the development of **buyer-centric CPQ for manufacturers with complex and configurable products**. The solution is currently used by 60 manufacturers from Slovenia, the United Kingdom and New Zealand. The team consists of 18 highly motivated team members. Configuring complex products is in the team's DNA. Combining their expertise in manufacturing, marketing and sales, they have extensive knowledge and experience in inquiry and order processing.

BUSINESS CARD

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Leon Panjtar, CEO leon@salesqueze.com











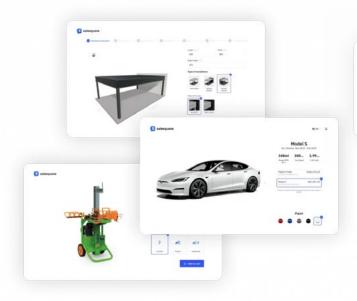
The vision of SaleSqueze team is to become the largest global sales automation platform for complex and configurable products in B2B or B2C and support the daily operations in worldwide sales and distribution networks.

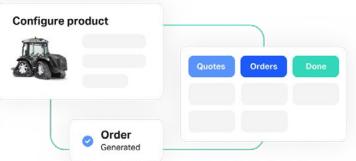
The team can boast of being among 5 of the best Slovenian startups of 2021. SaleSqueze was also in the finals of BoostUp! CLC East 2022 competition in Vienna in the category Supercharge and BoostUp! in Athens in the category Digital & collaborative solutions for innovative manufacturing ecosystems, both organized by EIT manufacturing.

ABOUT THE SOLUTION

Salespeople use the system to drastically reduce their administrative tasks and dedicate most of their time to closing deals. Companies enjoy a huge increase in the Inquiry-to-Order ratio for their made-to-order products and a huge increase in sales.

SaleSqueze provides traditional CPQ services such as product & service configurators, visualization with 2D and 3D support, lead, opportunity, and deal database, configurable kanban sales funnel pipelines, distribution network support, contact databases, email, calendar, and phone integration, marketing campaigns, analytics, and reporting tools. Unlike traditional CPQs, SaleSqueze is buyer-centric and allows customers to build and price products online by themselves and visualize them in 2D or 3D.





SaleSqueze is a revolutionary cloud-based and buyer-centric configure-price-quote (CPQ) platform **for manufacturers with complex and configurable products**.

SaleSqueze focuses on removing dull administrative work from everyday sales routine with a system that captures fully qualified inquiries, automatically quotes them, and encourages actionable steps, so that they push themselves to conversion into a paying customer.











I nista.io

nista.io was founded to help companies save energy and CO₂ on an ongoing basis. With Energy Efficiency as a Service, energy efficiency is offered as a subscription, identifying savings in annual energy costs. With nista, users can reduce their annual energy consumption by up to 20%, whether in industry or households.

nista.io now works with leading industrial companies that invoke energy efficiency measures being implemented on a large scale. Due to demands, our offer has already been extended to households, as there is a lot of potential for savings here as well. Now we aim to help, as quickly as possible, users of all sizes with

BUSINESS CARD

Campfire Solutions GmbH Am Tabor 36 1020 Vienna, Austria www.nista.io info@nista.io











the challenge of rising energy prices and necessary efficiency measures.

With nista.io, customers no longer have to search for individual experts for various energy use cases. nista.io delivers energy efficiency as a subscription, based on sensor data. In addition to its self-developed AI, which makes the processing of sensor data particularly fast and simple, its service offering itself as a subscription is unique. In doing so, nista.io makes a positive contribution to goals 9, 12 and 13 of the UN Sustainable Development Goals (SDGs).

Sensor data for district heating and electricity often remain unused because they are difficult to access, stored in incomprehensible formats and qualitatively unacceptable. As a result, efficiency measures in the energy sector often remain undetected. nista.io makes sensor data accessible at any time, in a user-friendly way. Furthermore, nista.io checks the reliability of this data and makes it directly processable and calculable. Users do not need special data analysis or programming expertise to perform analyses of sensor data. Optimization ideas can be evaluated with nista.io within a few minutes instead of investing several months in projects.



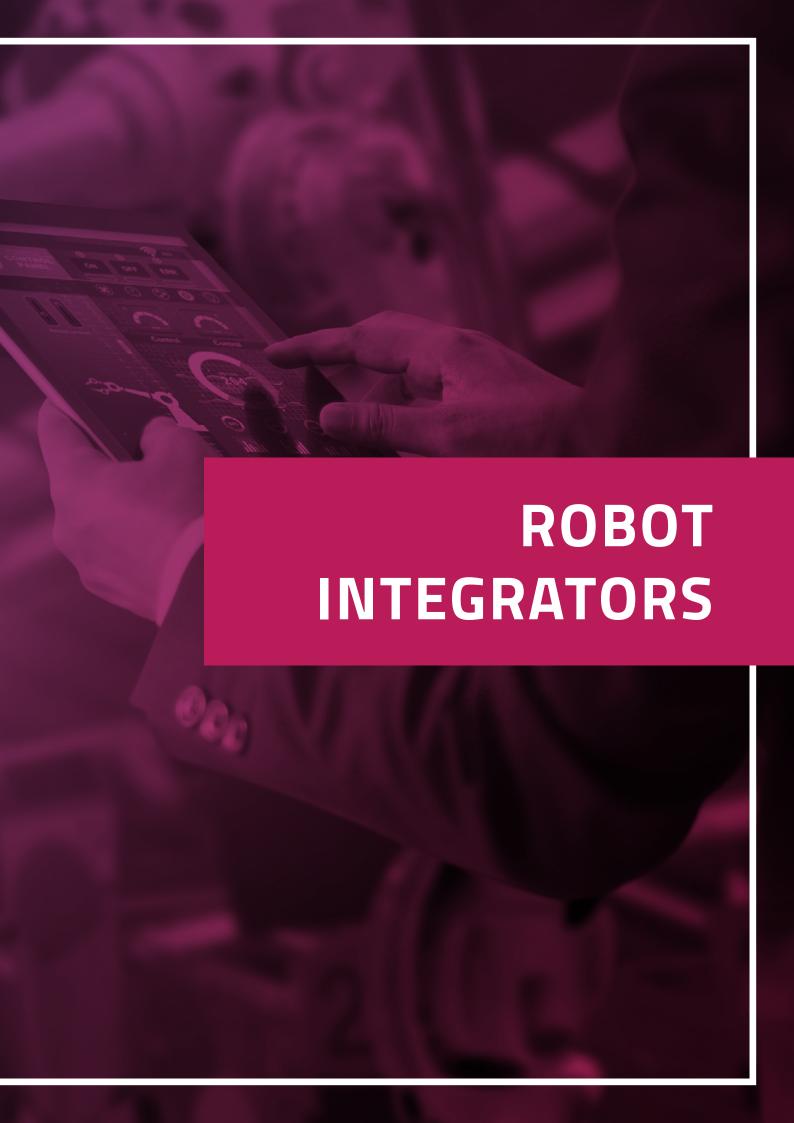














I FLX Robotics

AI-DRIVEN FLX ROBOTS: CHEAPER, FASTER, MORE FLEXIBLE

Our mission is to make local companies global leaders in manufacturing flexibility and efficiency through intelligent automation. FLX Intelligent Robot Workers are driven by **advanced AI** that helps them **understand the environment**, reducing the need for supporting equipment. Combined with a cost-efficient modular design, FLX Robotics delivers **flexible automation at a revolutionary low price**.

BUSINESS CARD

Airnamics d.o.o. Cesta talcev 1 1215 Medvode, Slovenia www.flx-robotics.eu info@flx-robotics.eu











FLX Robotics products range from affordable dedicated Systems focused on specific production tasks to advanced modular solutions that enable ultra-fast task switching in 10 minutes. All are powered by our ever-evolving AI and ready to support all future changes in the production process.

FLX Robots are set up in a few hours and deployed in a few days, with a typical ROI of just 18 months.

















I INEA RBT

INEA RBT is a company that delivers products and solutions for the automation and digitalization of industrial environments. In 1993 we have started cooperation with Mitsubishi Electric - more specifically we started distributing Mitsubishi Electric Factory Automation products (VF drives, PLCs, HMIs, servos, robots ...). Back then we have been working within INEA company.

INEA RBT has been founded in 2011 as the daughter company of INEA. Nowadays, we are a company with four globally recognized principal companies in our portfolio – Mitsubishi Electric, HMS Networks, KEP-WARE (PTC, Inc.), and inray Industriesoftware.

BUSINESS CARD

INEA RBT d.o.o. Stegne 11 1000 Ljubljana, Slovenia www.inea-rbt.si info@inea-rbt.si +386 1 5138 100











We are covering the geographical territory of Slovenia, Croatia, Bosnia and Hercegovina, Serbia, Kosovo, Montenegro, Albania, and North Macedonia. We have affiliated companies in Zagreb (INEA CR) and Belgrade (INEA SR), which enables us direct contact with two of the biggest markets in our region. The market for factory automation is moderately growing, and our experiences and references in that field are quite rich. Through three decades we have faced with various types of drive (frequency inverters & servos), control (PLC, HMI & SCADA) and robot applications.

In parallel with Industry 4.0 and encouraging digitalization growth, the industry is in need of connectivity solutions and valuable data. We have gained also experience in the field of remote data acquisition, remote machine access, and OPC connectivity. Factories, from small to big ones, are in need to deliver data from sensors, PLCs, drives, CNCs, injection molding machines, and other field machines/applications to the IT/managerial level of a company. Once data is acquired, users want to send them to various applications, from ERP, MES, IIoT applications, databases, and Clouds, to printers, various Excel tools, and other.

One of our favorite fields of work is robotics. We offer:

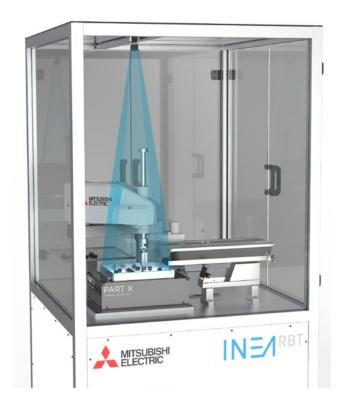
- 6-axis & SCARA robots for payloads of up to 20 kilos for Pick-and-Place applications
- three models of 6-axis robots with payloads of 35,
 50, and 70 kilos for packaging/palletizing purposes
- Cobot (MELFA ASSISTA) for collaborative applications in industrial environments

We can consult in the design, testing, and commissioning phase of robot applications. We have gathered numerous references in all major industries, from Automotive, Food&Beverage, Pharmaceutical, Metal, Fine Mechanical, and other fields. We also have some self-developed solutions for demanding applications:

Pick-and-Place solution with help of 2D & 3D Vision

- Pick-and-Place solution for randomly oriented pieces with help of Vibro Feeder and Vision
- Conveyor Tracking with help of the Vision system for Pick-and-Place applications

We complement our product portfolio with complete technical support. Nearly half of the employees are working in the field of product testing & commissioning services and after-sales support. When an opportunity arises, we also grab for development and research activities to see where are the limits of our products and solutions. Combining four different principles is definitely an advantage when offering automation and digitalization solutions.













SMM production systems

The company was founded in 1990 by Metalna from Maribor and Schiess from Dusseldorf (Germany). The newly founded company was originally named Schiess-Metalna Maribor Ltd. and then shortened to SMM production systems Ltd. The company has more than 100 employees.

SMM is an engineering and production company for the development of turnkey projects in the field of production equipment, which includes mechanical, electrical,

automation and software solution engineering. For more than 30 years, we have been developing our own know-how and fostering our own innovation capacity to support the production of global companies around the world.

We design, manufacture and deliver customised industrial equipment tailored to the customer's needs. With knowledge, experience, flexibility and innovation, we ensure that we deliver the highest quality to support the

BUSINESS CARD

SMM production systems Ltd. Jaskova 18 2000 Maribor, Slovenia www.smm.si info@smm.si +386 2 450 23 00











development of production for our partners. We have our own multidisciplinary research and development team to solve the production problems of our partners. We are committed to offering solutions for the complex needs of our partners and realising development ideas for a smart industry that is still not on the market.

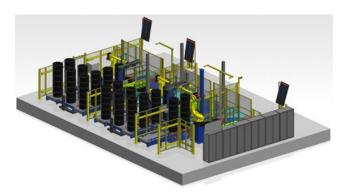
Our solutions and services include:

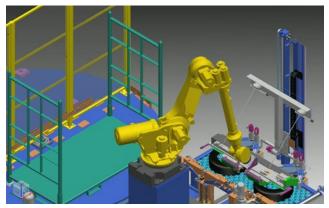
- Engineering solutions in the field of production systems including research and development,
- Client customised services Manufacturing equipment assemblies and parts according to the customers' documentation that requires high quality standards and traceability,
- Representation and partnership with renowned producers of equipment for automatization and safety.

We are constantly striving to keep up with new trends and technologies in modern industry. The company's development concept and sales programme are continuously upgraded and improved to ensure that the company remains competitive in an ever-changing industrial environment. We conduct research, development and industrial implementation of intelligent production systems and solutions in the following areas:

- industry 4.0 and smart manufacturing,
- smart production systems (machine vision, machine learning and big data analysis),
- cyber-physical systems and digital twins.





















Avastar Automation

30+ years of experience in robotics and industrial automation solutions. We perform the Development, Design and Production of automated & robotised machines for production processes where demanding Automotive industry standards and specifications are applied (100% traceability, 100% repeatability, 100% product quality control, 100% process control). We are mainly an auto-

motive production process integrator – hardware and software-wise but operate also in sectors like home appliances, electric, etc. Our products are interconnected with other machines in the surrounding environment. They communicate with them and collect process data for immediate usage and decision-making. Our products are ready for Industry 4.0 requirements and ready

BUSINESS CARD

Avastar Automation d.o.o. Ulica 15. maja 1a 6000 Koper, Slovenia www.avastar.si info@avastar.si











to be integrated into Smart plants of the future. Avastar is a team of 25 experts, skilled in all main fields of Ind 4.0 production processes and requirements. Turn-key solutions are our core business. Satisfied customers are our main goal. Besides robotics and automation solutions we also offer special fixing solutions for the CNC machining of metal products. Avastar is the leader in the Slovenian market for hydraulic fixtures for CNC machining, especially for aluminium structural parts which are built in electric and hybrid vehicles. ISO9001 Quality Management System forms the frame and defines the ways of a structured and formalised Business model in our company.













Albatros-PRO

Albatros-PRO is a family business that develops and manufactures dedicated machines and devices for automating production processes. We are guided by many years of experience, a wide range of skills, critical thinking, responsiveness, adaptability and attention to detail and aesthetics. We build the company's long-term development on comprehensive solutions that follow the trends

in industrial automation and are adapted to the customer's requirements, wishes and needs. We work closely with the customer in all steps of the project, from the conceptual design to the final implementation. Knowing the standards of various fields and industries and mastering various technologies allow us to adapt to the customer's requirements and achieve optimal solutions.

BUSINESS CARD

Albatros-PRO d.o.o. IOC Zapolje I 22 1370 Logatec, Slovenia www.albatros-pro.si info@albatros-pro.si











OUR CORE BUSINESS

The company's core business is the production of robotic cells and dedicated machines for production automation. We offer innovative, technologically advanced solutions for various areas of industry (automotive, medicine, wood, cosmetics...) and by using a wide range of different technologies we solve complex challenges and develop new approaches in the field of automation and digitization of production. We manufacture devices for a wide range of fields and follow industry trends and requirements by using various technologies. Our products are unique, robust, complex, modular and aesthetic. They work reliably and follow the development of techniques and technology and are user-friendly.



Our vision is to become and remain a leading independent company for the development of new solutions in the field of automation and robotization of technological - production processes with the expressed note of a company that cares for its employees, the wider local community and the environment.



















I PS Logatec

We deal with the design and automation of machines and represent recognized manufacturers of equipment that is necessary for the automation of production. With our knowledge and experience, we can advise on the selection of a suitable servo drive or implement the automation of the machine according to your wishes.

We perform:

- special machines construction and execution
- machine processing
- machine control
- electrical cabinet manufacturing
- robot integration
- · equipment service

We supply:

- servo drives
- frequency and vector regulators
- safety controllers and light safety curtains
- measuring systems with displays
- · controllers and industrial computers
- · planetary reducers
- robots

BUSINESS CARD

PS Logatec d.o.o. Kalce 30b 1370 Logatec, Slovenia www.pslogatec.com info@pslogatec.com +386 1 750 85 10









Robotics is a technology that doesn't inherently have any good or bad effects to it. You could use a hammer to hit a nail, or you can use a hammer to hurt somebody.

Dr. Shyam Sundar, Penn State researcher, founder of the Media Effects Research Laboratory

Yaskawa robots manufactured in Slovenia for EU



YASKAWA



Innovation Day Ljubljana – Robotics & Manufacturing

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