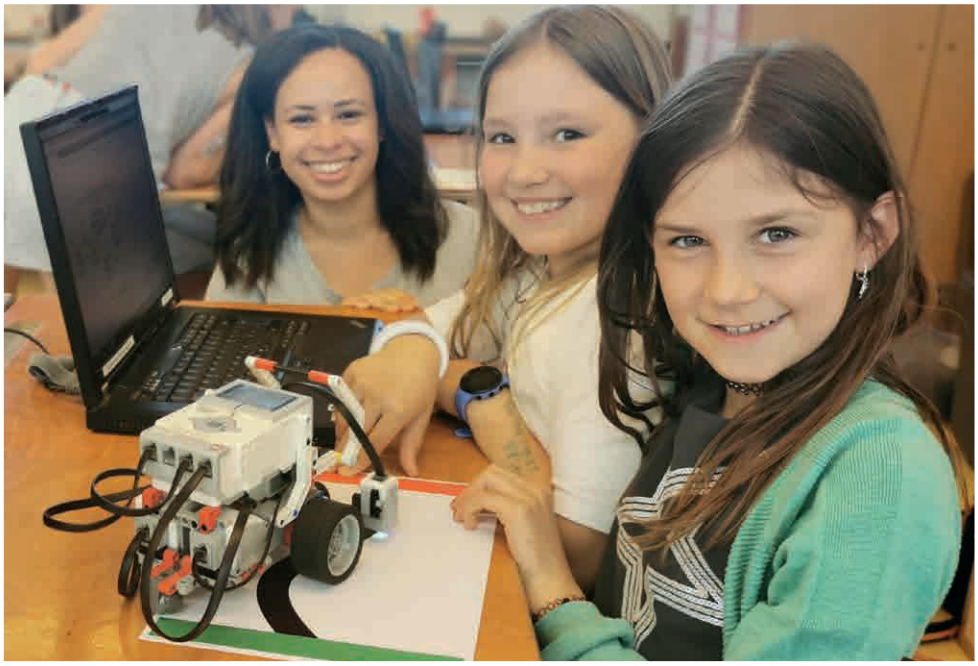
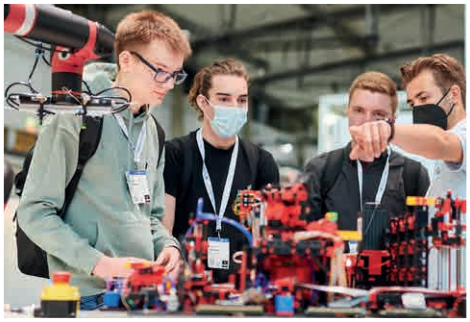
Edition 10

Gerda Stetter Stiftung

Technik *macht* Spaß!





Annual Report 2022

What we aim for:

- ✓ Learning with fun
- ✓ Earliest possible inspiration for technology
- ✓ Instilling independent thinking
- ✓ Understanding cause-effect relationships
- ✓ Supporting children from socially disadvantaged families
- ✓ Getting more girls and young women interested in technology
- ✓ Fostering children from all nationalities
- ✓ Joint learning of young and old
- ✓ Crosslinking of schools, universities & companies
- ✓ Introducing High-Tech
- ✓ Supporting professionals on a long-term basis

„What we do today determines
what the world will look like tomorrow."

(Marie von Ebner-Eschenbach)

„2022 – Skills shortages everywhere“

The last few years have been marked by many disruptive changes. First, Covid kept the world on tenterhooks, and now, in addition, the consequences of the war in Ukraine are massively shaking the established economic and social paradigms. The resulting increased demands require (even) more improvisational talent and innovative strength. However, the ability of companies to innovate is being held back to a greater extent by the ever-increasing shortage of skilled workers. This is causing major problems, especially in engineering-driven companies. But it is not only companies that are suffering from a growing shortage of young talent; colleges and universities are also lacking young people in the STEM-related engineering subjects.

For this reason, we are once again significantly expanding our activities. Although the intensity of these activities was impaired by Covid, they did not come to a complete standstill. At the beginning of the year, for example, we again had students working on demonstrators and programming them to automatically serve ice cream. This demonstrator was particularly well received during the hot summer months. We also designed and developed a demonstrator for Google, which was exhibited at the Hannover Messe and will now find its permanent home in the new Google Cloud Space in Munich.

In addition to our educational efforts with Young Talents who are enthusiastic about technology, we are also stepping up our foundation work. To this end, we started building bridges between universities and schools again at the beginning of the year in order to get not only boys, but especially girls, excited about technology at an early age. This ground work is important in the mid-term. If we don't actively get the youngest children excited about technology, we won't have enough digitally savvy specialists in the long term. In order to present these activities even better, our Gerda Stetter Foundation website has been given a new look and now provides an even more comprehensive presentation of our activities.

Together with associations, trade-fair companies and businesses, we are also planning versatile innovation festivals in the new year to get our new generation excited about digital and sustainable topics. We are currently in preparation for a series of MAKEATHONS, which we plan to hold both internationally and nationally. The kick-off event will take place in March 2023, once again on Gran Canaria, where we have already been committed to the topics of sustainability and digitalization for years.

With the projects and prototypes resulting from the MAKEATHONS, we want to encourage and challenge young people to develop innovative SMART & GREEN Technologies and thus help shape the future in a sustainable way. The good thing about today's times, marked by many different crises, is that it is becoming increasingly clear that without change there will be no improvement. That's why we will continue to work hard to advance educational initiatives. Because without breaking new ground, we will not be able to counter the shortfall of skilled workers. Join us! We are highly motivated!

Rainer Stetter

Dr. Rainer Stetter
Foundation & Board Member

The Foundation Members

The Managing Board:

"To be an entrepreneur also means assuming social responsibility. With our foundation, we want to push the technological education of children, students, and refugees with playful projects. After all, "childlike" curiosity and a freely lived play instinct form the basis for constant renewal and innovation."

Dr. Rainer Stetter, CEO and the Foundation Founder, ITQ

"With our comprehensive, modular training concept, we want to counter-act the shortage of digital specialists at an early stage and thus sustainably promote and train young technical talent. And we want to do this in a fun, joyful and enthusiastic way at all levels, because that's the greatest motivation for sustainable learning."

Sandra Stetter, Head of Business Administration, ITQ

The Foundation Board:

"Contributing to the earliest possible practice-oriented training is my personal motivation. By teaching technology in a playful way, we can simultaneously contribute to improving the image of technical professions."

Andreas Baumüller, CEO, Baumüller

"The current rapid development in digitalization offers countless possibilities especially to children and young people. In order to make effective use of these, projects are needed that inspire enthusiasm for technology and are fun. I consider it my task as a member of the Foundation Board to support these young people in optimally shaping the prospects arising from technological progress."

Matthias Weidmann, Lawyer and Tax Consultant

The Foundation Board:

"Companies have to take responsibility for training the next generation of employees. Getting young people excited about technology is the basis for this. Industry-related projects with universities and colleges of all kinds are suitable for bringing industry and training closer together."
Paul Kho, Freelance Journalist

"Our motivation is to inspire enthusiasm for science and technology. For me, bringing children closer to this in a playful and natural way, using modern and tangible learning methods, means thinking and acting in an entrepreneurial, future-oriented way. Just do it!“
Martina Manich, Managing Director, team::mt

"Digital transformation has a huge impact on engineering education. Only with new innovative teaching concepts can we keep up with the rapid development of new technologies. By simultaneously teaching practice-oriented and character-building competences with attractive formats, we can inspire students to study and prepare them well for the demands of the working world.“
Prof. Dr. Peter Eichinger, University of Applied Sciences Aalen

Impressions of our Network

Voices:

"The Gerda Stetter Foundation, with its vision of promoting technical training for young people in a playful way and shaping a sustainable future, inspired me right from the start. Since the inception of the Foundation by Dr. Rainer Stetter, I have been a big supporter. It is extremely important to me to support the activities with know-how and to provide financial resources and the necessary material. I have already been able to experience many projects - from training projects such as the Smart Airhockey Demonstrator to the realization of the 1st SMART GREEN ISLAND MAKEATHON on Gran Canaria. In my opinion, these training activities are very effective and, especially in today's world, with the ever-increasing shortage of skilled workers, they are indispensable."

Dr. Ulrich Viethen
CEO
Murrelektronik GmbH

"With our university initiative "Young Engineers Support" we support students and lecturers with our products and financial resources. At the SMART GREEN ISLAND MAKEATHON we can enter into direct dialogue with the students. It is exciting to see how our Low Cost Automation Products can be used in sustainable and innovative solutions. That is why we support the concept of the SMART GREEN ISLAND MAKEATHON."

Alexander Mühlens
Head of Low Cost Automation
Robolink and Drylin
igus GmbH

"It is very important that we network with each other in a global world. The SMART GREEN ISLAND MAKEATHON is a highlight project with participants from all over the world. Together with the Gerda Stetter Foundation, we are initiating further SMART & GREEN projects to secure young talents for Gran Canaria and the whole world. We are very pleased to be part of this great network community and to make our own contribution to it. True to the motto SMART GREEN INNOVATIVE."

Nayra Moreno
Manager
Fundación Sergio Alonso

"In cooperation with ITQ, we were able to develop and implement a demonstrator for trade fair appearances for Google Cloud in a very short time. The advantages of Industry 4.0 based on a connection between on-premises and cloud-based applications can be optimally conveyed to our customers. The first major and successful application of the Google Cloud Demonstrator was at Google Cloud Next 22. The demo will then find its permanent home in our new Google Cloud Space Munich. With this ITQ model, we support students with relevant practical assignments in the MINT area – a great concept that benefits everyone involved."

Julian Geiger
Industry Solutions Manager
Cloud Manufacturing & Industrial
Google Cloud

Voices:

"As a working student at ITQ, I had the opportunity to take part in several innovative projects. One of the projects was the development of a demonstrator for Google. I was part of the team right from the start and was able to take on responsibility immediately. Together with our ITQ project manager, we designed the Google Cloud Demonstrator that represents AI-based solutions for the manufacturing industry. I am very proud to be part of this Education 4.0 project. Apart from the practice-oriented experiences I have learned a lot about soft skills and networking. I feel well prepared for my future career."

Markus Bever
Working Student
ITQ GmbH

"Since the beginning of the war in Ukraine, our Landshut Association DOM e.V. has been committed to ensure that the many people who have fled to Germany arrive safely here and can experience a little bit of everyday life. It was particularly exciting and valuable for the children and young people to be invited to a LEGO Mindstorms Workshop in Garching by the Gerda Stetter Foundation. For one day, the young people could put their worries aside, do programming and have fun together. Our youth group "Molodezhka" says many thanks to the entire ambitious and very friendly team for an unforgettable and educational workshop."

Mascha Sidorova-Spilker
Management
Nachbarschaftstreff DOM e.V.

"The "MAKING" represents a special form of learning, in which ideas and approaches to solutions create new empirical knowledge by trying them out. In the case of interdisciplinary projects, the combination of scientific knowledge and operational experience creates a very special added value: students benefit from the extensive project experience and technical expertise on the part of ITQ and thus learn the complexity of projects implemented efficiently under practical conditions. We dedicated the last semester, together with the ITQ to technologies for a sustainable life. Together we managed to develop two successfully tested prototypes."

Prof. Dr. Karsten Nebe
Course Director
Master of Usability Engineering
Rhine-Waal University of
Applied Sciences

"We took part in the last SMART GREEN ISLAND MAKEATHON and it was really great to see how Young Talents solved the industry challenges in an innovative way. The Education 4.0 approaches and projects of the Gerda Stetter Foundation are very inspiring and highly valued. We will use this concept in the future and also introduce and implement it in India. That's the only way we can cope with the new challenges of digitization and advance new technologies worldwide."

Raj Vangapandu
Founder
Indo-Euro Synchronization

Our Education Concept

Modular Education Concept

Getting young people excited about technology is the basis for ensuring a qualified future workforce in German companies. Technical knowledge should be taught in a way that makes it fun for young people to discover technology.

The Gerda Stetter Foundation has set the goal for a modular training concept. We want to get children and young people excited about technical projects and thus help shape the technology of tomorrow in a smart and green way.

The focus of our activities is the handling of technical knowledge as well as the practice on technical projects. With this we already start at kindergarten age with our Technology Workshops in a very playful way. Our LEGO Mindstorms projects, which teach initial programming skills, are designed to get as many young people as possible excited about science and technology at an early age.

Furthermore, they serve to reduce the fear of complex technology. The pupils are coached by university students and build autonomous robots consisting of sensors, motors, and lots of colourful LEGO bricks as part of the project. The foundation operates according to the top-down principle, i.e., students supervise projects in which they pass on their knowledge to pupils. Consequently, elementary school children are guided by the pupils who have been trained in a LEGO Team.

Management	Engineers	Students
		
▪ Basics and importance of systems engineering ▪ Understanding of mechatronical projects and processes	▪ Improve knowledge about interdisciplinary work ▪ Enhance the use of software	▪ Soft skills and experience in project management ▪ Increased understanding of software

Another important point is better dovetailing, as the networking of disciplines and know-how will play an increasingly important role in the future.

Since the company was founded, we have maintained a comprehensive and cross-industry as well as international network consisting of leading industrial companies, partners, schools, and universities.

We are very involved in research and education and are pleased to have many successful collaborations and research projects with German and international companies as well as universities. By combining cross-departmental lecture concepts with practical team semester work in the industry, students learn to work independently, gain efficient project management skills as well as interdisciplinary knowledge and how to acquire important soft skills. In addition, we place great emphasis on promoting innovative capability and creativity and have therefore been organizing our MAKEATHONS at national and international level since 2016.

The name "MAKEATHON" forms a pun from "MAKE" and "MARATHON" and is an innovative & creative educational event, where several teams consisting of young talents develop innovative prototypes as well as technological concepts in an agile and interdisciplinary way in a very short time.

Thus, we bring together companies, universities and students who enjoy the fun of designing, constructing, and programming as a common denominator.

Trainees

- Foster fascination for technology
- Practical professional training

Pupils

- Understand cause-effect relationships
- Promote team work and independent thinking

Children

- Learning with fun and fascination for technology
- First experience with mechatronics

Digital Education – Technology Workshops

Technology Workshops – Getting tomorrow's Youth excited about Technology

How do you get young people excited about technology?

That's a question many companies have to deal with these days. To get our young people excited about science and future technologies in a playful way as early as possible, we have been offering numerous innovative Technology Workshops for children and young people for many years.

We are particularly committed to promoting the technical education of girls. With our workshops, we want to help children and young people overcome their fear of complex technology. Whether it's a smartphone or a game console, technology is now part of many everyday objects that children and young people are confronted with at a very early age.

In addition, the speed of technological change continues to increase. This makes it even more urgent to have experts who research, develop and are informed about future technologies. Our Technology Workshops help children and students of all ages learn basic technical skills that will be required in their future careers, using do-it-yourself mini robots, LEGO Education, woodturning and soldering stations.

BENEFITS
How to benefit from our workshops

- Early promotion of young talents
- Learn technology interactively, and playfully
- Use of various technologies
- Networking with schools, universities, institutions, and companies
- Practice-oriented and innovative learning concepts
- Teaching technology to children and young people
- Know-how and knowledge transfer
- First introduction to high-tech
- Coaching and support

TECHNOLOGY WORKSHOPS OVERVIEW
We teach technology with a lot of fun!

Getting young people, and girls in particular, enthusiastic about technology is the basis for securing qualified young people in German companies. Technical knowledge should be prepared in such a way that young people have fun discovering technology for themselves.

- **150 Workshops**
- **With over 4500 Participants**
- **In 3 Countries**
- **With 50 Schools, Institutions**
- **10 Trade Shows**
- **With 15 Companies**

Securing the next generation of the future with the right Technology Workshops!

Playfully learning Technology

We focus on creativity and fun in dealing with technology. Children and students are presented with technical challenges in a playful manner and learn to develop solutions independently. This process contributes to lifelong learning, as this enthusiasm for technology is stimulated from an early age and maintained into adulthood.

Since 2011, we have been awakening the interest for technical projects of children and young people of all ages in kindergartens, schools, or educational institutions worldwide with our Technology Workshops. With our Cleaning Robot, we succeed in motivating even the very young ones. In this kit, a robot is assembled by the children, from the wiring to the mechanics, and then moves across the floor driven by an unbalance. With the help of our specially trained technology coaches, we can reach a wide range of young people with simple technical means and encourage them to tinker, develop and program.

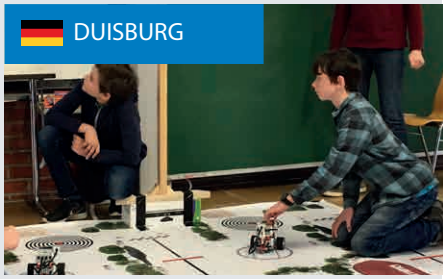
Our training concept is based on cooperation with various German universities. In recent years, we have trained more than 500 students as technology coaches. These in turn have been able to teach more than 4500 children about technology in a playful way in workshops, at trade fairs or in schools.

TECHNOLOGY WORKSHOP HIGHLIGHTS

MUNICH

INGOLSTADT

DUISBURG



NUREMBERG

REGENSBURG

BERLIN

LANDSHUT

SPAIN

CHINA

Digital Education – LEGO Workshops

LEGO Workshops – Playfully learning Technology

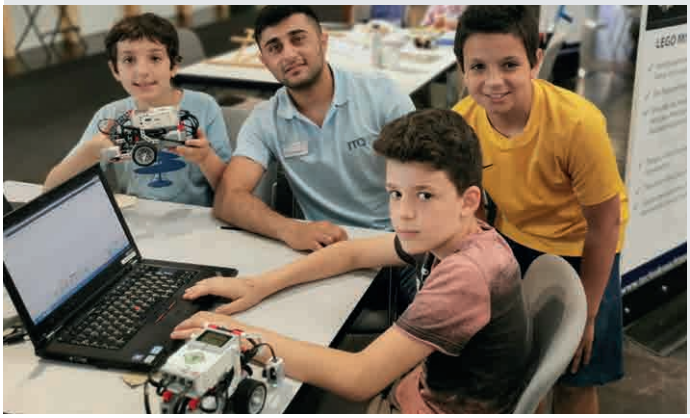
When it comes to promoting key skills for the 21st century, we offer versatile Technology Workshops with our LEGO Education training concepts. Whether for schools, educational institutions, training centers, universities or for introducing adults and companies to technologies – with LEGO Mindstorms EV3 or LEGO WeDo Edcuation, programming as well as future technologies can be taught in a playful way.

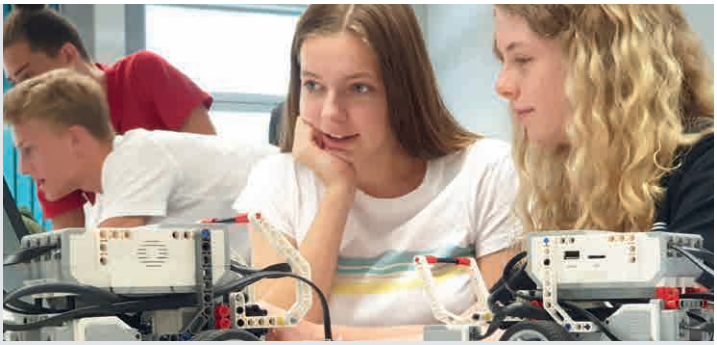
Almost everyone knows the colourful LEGO building blocks as toys, but the small bricks also have great potential for education. With our Technology Workshops, we can use the action-oriented learning concepts of LEGO Education to teach schoolchildren and students of all ages basic technical contexts that will be required in their future careers. With practical teaching concepts, learners are encouraged to think for themselves and work creatively on innovative solutions.

By experimenting and trying things out for themselves, children and young people learn to grasp complex topics, to question them critically and to develop their own creative ideas and approaches to solutions. In education and training, the learning system is also suitable for modeling, analyzing and programming industrial processes.

BENEFITS
How you benefit from our cooperation

- Training of qualified future employees
- Learning programming skills
- Use of future technologies
- Networking with schools, universities, institutions, and companies
- Practice-oriented and innovative learning concepts
- Teaching technology to children and young people
- Know-how and knowledge transfer
- First introduction to high-tech
- Coaching and support





LEGO WORKSHOPS OVERVIEW
We teach technology with a lot of fun!

Getting young people, and girls in particular, enthusiastic about technology is the basis for securing qualified young people in German companies. The transfer of technical knowledge should be prepared in such a way that young people have fun discovering technology for themselves.

- **300 Workshops**
- **With over 900 Participants**
- **In 5 Countries**
- **With 150 Schools, Universities**
- **35 Competitions**
- **With 40 Companies**

With our innovative education concepts, we secure the young talents of the future!

Innovation through Education 4.0

With our LEGO Education learning concept, we inspire not only children and young people, but also specifically girls for technical projects worldwide. Our education concept is based on the well-proven top-down principle, in which young students are guided and trained by our ITQ LEGO Coaches. In addition to technical content, the program includes soft skills for dealing with children and young pupils.

The pupils, who are coached by students, assemble robots with sensors, motors and many colourful LEGO bricks in our LEGO Mindstorms Workshops. To help us spread our approaches even further, we developed the concept of student LEGO Coaches for pupils initially at the Technical University of Munich and since then we have established it at several other universities. In the context of soft skills events, we offer students the opportunity to learn and apply necessary soft skills using a real interdisciplinary development task as an example. To further deepen these skills, students coach pupils towards a robotics competition.

This approach, which we want to introduce to as many other colleges and universities as possible, brings us closer to our goal of providing schools with a broad supply of motivated coaches.

LEGO WORKSHOP HIGHLIGHTS

MUNICH

DUISBURG

NUREMBERG

HEIDENHEIM

AUGSBURG

CHINA

SPAIN

URUGUAY

USA

Digital Education – MAKEATHONS

MAKEATHONS – Securing our Future with Innovation Festivals

Innovative minds secure the future of companies – but how do you find them? In particular, skilled workers who bring knowledge from the fields of IoT, robotics, artificial intelligence, smart automation, smart mobility or smart green energy are in demand.

That's why we organize innovation festivals (MAKEATHONS) with the aim of training Young Talents to become innovative and creative professionals and bringing them into direct contact with companies to develop creative, technical projects together. The name "MAKEATHON" forms a pun from "MAKE" and "MARATHON" and is an innovative & creative educational event, where Young Talents (students, trainees, and apprentices), consisting of several teams, create and develop innovative prototypes as well as technological concepts in an agile and interdisciplinary way in a very short time.

The practical requirements (Industry Challenges) often come from companies that want to develop a suitable software or hardware solution for their own problem.

We bring together companies, universities and students who have as a common denominator the fun of designing, constructing, and programming. The results are remarkable, and it always amazes us how quickly the Young Talents turn their creative ideas into reality.

BENEFITS
How you benefit from our cooperation

- Development of new innovative ideas and concepts
- Recruiting of qualified Young Talents
- Establishment of technology cooperations
- Elaboration of your Industry Challenge
- Initiation of new business models
- Knowledge and know-how transfer
- Networking with companies, universities, and students
- Part of a national and international innovation community

MAKEATHONS OVERVIEW
We "MAKE" on a national und international level

We have already shown it many times, what new ideas for a digital future can look like or how recruiting talented developers in the competition for talented professionals can work.

- **30 MAKEATHONS**
- **With over 3000 Participants**
- **In 6 Countries**
- **With 350 Universities**
- **Over 1000 Ideas**
- **1100 developed Prototypes**

Be part of our innovative MAKEATHON Community!

Innovation through Education 4.0

There is a lot of talk these days about Education 4.0 and innovation. However, there is usually more talk than action, which is why we have been working for years on developing new concepts and formats to promote Young Talents and bring them into contact with companies.

Our idea to organize a MAKEATHON was born in 2016 in Munich, where it immediately proved to be an excellent educational concept. Since then, we have been constantly developing the event and it has already taken place in many other countries. By now, we connect companies, industry associations, universities, institutions, and schools not only in Germany, but worldwide.

Due to Corona, we had to initiate new ways and flexibly adapt our concepts in spring 2020. As a result, we were able to host our first Hybrid MAKEATHON at the end of June 2020, just a few weeks after the first easing of the lockdown.

This new format digitally connects small, locally operating teams via the "network" and thus makes it possible to react quickly and flexibly to external conditions.

This can be seen in the organization of an event with completely new partners from industry, associations and universities and a total of almost 100 people in less than five weeks.

MAKEATHON HIGHLIGHTS

Smart & Green – Our Vision

An Island as Demonstrator

The world is undergoing a massive upheaval. Technological, social, and climatic conditions are changing at a steadily increasing rate. A virus has made it very clear how fragile our system is. Entire industrial sectors, such as the pharmaceutical industry, but also the automotive industry, are changing with incredible speed. Climate change seems to be accelerating more and more, with hot weather periods, with temperatures above 40 degrees celsius and alternating with severe storms.

Although there are many discussions, talks and protests, responsibilities are usually only shifted back and forth. Determined and joint activities, however, do not emerge. To counter this perceived self-paralysis, we launched the "Smart Green Island" project at the end of 2016.

Within this project, we want to work together with motivated minds from different disciplines, generations and nations to develop technically smart concepts and solutions to demonstrate how a (green) life in harmony with nature is possible. Our vision is to demonstrate, using the island of Gran Canaria as an example, how a closed loop between energy production and usage can be created in a smart way while at the same time preserving the existing natural resources.

However, with this project, we do not only want to show how energy can be used in an intelligent way. In fact, almost all areas of daily life need to be addressed to provide a comprehensive picture of how life and work can take place in harmony with people and nature.

The needs of the world' s countries in terms of environmentally compatible living are very different due to different economic and climatic constraints. In order to be able to run through as many different scenarios as possible in a geographically compact and thus resource-efficient manner, Gran Canaria was chosen. This almost round island with a radius of about 45 km is practically a continent in miniature due to its unique geographical location with a total of 14 climate zones. On this island, both sub-tropical and desert-like conditions as well as scenarios in an urban or rural environment can be played out simultaneously.

Digitalization and Sustainability

The proximity of Gran Canaria to Africa and its location in the Atlantic means that solar and wind energy is available in almost unlimited quantities. This energy could be used to desalinate water, which is needed for daily life and agriculture. At the same time, sustainable living and emission-free mobility could be realized. Furthermore, the intelligent and digital connection of the different areas can open up further ecological and economic opportunities.

To put these objectives into action, we have been organizing our SMART GREEN ISLAND MAKEATHONS on Gran Canaria since 2016. Through these events, we can build a global network of motivated individuals. At these innovation festivals, several hundred students from different universities around the world, as well as numerous national and international sponsoring partners from industry, come together on Gran Canaria. For four days, students work together with companies on climate-friendly technologies and develop first innovative prototypes. Five of these innovation festivals have been held in the period from 2016 to today, with a total of more than 1000 participants from over 30 countries and 100 universities.

Complementing the MAKEATHONS, other "Smart & Green" projects have been carried out on the island to deepen and expand the knowledge gained from the events. For example, in previous years students were able to develop climate-friendly projects, such as the PlastiX project, during the Smart Green Summer Camps. In addition, students can make optimizations as well as further developments to the existing prototype during long-standing projects, such as the Bamboo Solar Car – a solar-powered vehicle with a frame made of bamboo.

The Corona pandemic did not stop at live activities either and therefore, numerous events had to be cancelled or adapted and held with a changed concept. However, the ITQ Group used the months of the lockdown to develop new and innovative concepts. Together with the Rhine-Waal University of Applied Sciences and ITQ GmbH, Dr. Stetter ITQ S.L.U. is planning to set up a "Green Lab" on the island.

Young Talents will have their own location on the island to work on their green projects. This already started this summer with the interdisciplinary student project "Future Technologies for Smart Green Islands" of the Rhine-Waal University of Applied Sciences. During the seminar, students develop their first innovative and sustainable projects, which are then to be continued on Gran Canaria.

In order to advance our vision of the Smart Green Island, we want to offer our students a professional working environment on Gran Canaria. Therefore, we are looking for a suitable location on the island to get closer to our goal of developing Gran Canaria into a European demonstrator for a smart and green way of life.

Smart & Green – MAKEATHONS

SMART GREEN ISLAND MAKEATHONS – History

In September 2016, we held the first SMART GREEN ISLAND MAKEATHON with more than 40 participants, advancing future "digital" and "climate-friendly" innovations. Just 30 months later, we were able to increase this number ten-fold and already attract 400 participants to our event. Four years later, in 2020, there were even more than 500 registrations. Accordingly, the SMART GREEN ISLAND MAKEATHON has established itself as a successful, innovative, and international success model. With each additional MAKEATHON, the vision of a SMART GREEN ISLAND is realized a bit more and Gran Canaria becomes an exemplary climate-neutral island.

KEY FACTS

During our MAKEATHONS, new ideas and solutions are constantly being developed by Young Talents regarding topics such as Smart Home, Smart City, Smart Production, Robotics, AI, IoT, Smart Mobility, Smart Farming, Smart Health and Smart Green Energy.

- 5 MAKEATHONS
- Over 1000 Participants
- With 30 Nations
- With 150 Universities
- Over 200 Ideas
- 250 Prototypes

SMART GREEN ISLAND MAKEATHON IMPRESSIONS

2020

2019

2018

2017

2016

Bamboo Solar Car: Sustainable and innovative Mobility

During the Smart Green Island Makeathon in February 2019, the idea for a new Smart & Green innovation project in the Smart Mobility sector was born – the Bamboo Solar Car – a solar-powered car made of bamboo.

This low-cost vehicle made from standard components and renewable and recycled parts is intended to make sustainable electromobility available to everyone. The focus here lies on countries and regions with a weaker infrastructure and many hours of sunshine, as the Bamboo Solar Car uses a solar cell on the roof to generate energy for movement. The car's frame is made entirely of bamboo tubes, which are cut and glued together using precise instructions. The flexibly sized solar panels achieve an energy output of up to four kilowatt hours. After just one day of sunshine, the car battery is half charged, and after two days it is fully charged. In this case, the car has a range of about 30km, which can cover at a maximum speed of 40km/h.

A first prototype was already created in May 2019 during the ITQ summer event. Within only 24 hours, the ITQ team succeeded in developing this first prototype.

Through the globally established network of Dr. Stetter ITQ S.L.U. with international universities and colleges, exciting follow-up projects could be realized. Consequently, 4 project teams were formed at different locations, which were digitally connected with each other.

The student teams from Germany, Gran Canaria, Tunisia, and Botswana incorporated their know how and worked energetically on the optimization. Between March and October 2019, a total of three prototypes of the Bamboo Solar Car were built.

2. Prototype, Laserworld of Photonics, June 2019

1. Prototype Bamboo Solar Car, ITQ Event May 2019

3. Prototype Bamboo Solar Car, Gran Canaria

Solar Car Botswana: Recycling Car in Safari Design

The fourth prototype was created at the end of 2019 – during a makeathon in Botswana. Here, the team was faced with its own unique challenges. The German students imported suitcases full of materials such as electronics and car parts to Botswana; only the raw material bamboo was ordered locally in advance. However, at the beginning of the MAKEATHON it turned out that the bamboo – which was initially considered to be essential – could not be procured. As a result, the team had to redesign the entire car body under great time pressure. In discussions with local MAKEATHON participants and companies, local, low-cost resources were found. The team obtained old, rusted steel tubes for the frame from a nearby recycling yard.

Within one night shift, the students welded and soldered together a sturdy car body. Through exchanges with locals, it became clear that another feature was indispensable for the African conditions: a protective tarpaulin to protect against sand and dust. Thanks to good networking and a high team spirit, a company was found that quickly made a tarpaulin overnight to protect the solar car from dust and dirt. Thus, the Bamboo Solar Car became a recycled solar car in safari design.

The organization of projects like the Bamboo Solar Car in connection with Makeathons offers young people an ideal platform to network with each other and gives them the opportunity to generate innovative ideas and develop prototypes in a short time. In addition, such projects and events draw the attention of companies to the young talents and their skills.

Our vision behind the Solar Car Botswana project is very diverse and easily applicable for global educational purposes. We are particularly keen to promote young talents within the framework of innovative educational events, to provide creative training, and to generate enthusiasm for technology and future topics in the fields of digitalization and sustainability.

With Education 4.0, we manage to develop innovative solutions for the problems of our time. The focus is on promoting education beyond national borders and thus supporting the young generation worldwide and getting them excited about future topics such as Smart & Green Technologies. In doing so young people are given the opportunity to shape their own future and that of their country.

International student team Solar Car Botswana

Solar Car Botswana

Solar Golf Car: Smart Golf Mobility

The idea for this project was born in cooperation with a local golf course, which is neighbouring to the Dr. Stetter ITQ Smart Villa on Gran Canaria. The operators of the course became aware of our activities like the SMART GREEN ISLAND MAKEATHON and the Bamboo Solar Car, after doing test drives near their golf course. Thereupon, the operators approached us and the idea to equip their golf cars with solar panels was quickly developed.

The goal of the Solar Golf Car is to develop a concept to make golf more sustainable in terms of Smart & Green Mobility. With the installation of solar panels and the use of solar energy, the CO2 footprint of golf can be reduced.

With the Solar Golf Car Project, we want to advance solutions in the sector of Smart & Green Mobility. The project is a good example to show that even with small means and innovations an effective and sustainable contribution can be made to our environment, as well as achieving great things in total. It combines ecological and technological innovation. In addition, the Solar Golf Car is perfect for a student project to give young people the opportunity to help shaping their own future. Moreover, in this process their skills in terms of international and interdisciplinary cooperation as well as practical project management could be expanded. These aspects are also essential and indispensable in the context of Education 4.0. After the first prototype, two optimized versions of the Solar Golf Car followed in 2020. These included improvements such as a cloud-based data storage space with dashboard visualization, an improved sensor technology and a simplified hardware architecture.

Furthermore, the students worked on a new connector design (fiberglass connecting parts) between the solar panel and the golf car to make it safer and more aerodynamic. To ensure an efficient and cost-effective manufacturing of this connector, the team developed a reusable wooden form to easily build these connectors. This also leads to faster, more resource-efficient and more accurate reproducibility of the connector. In this effort the ease of assembly and repeatability of their construction was very important to the students to ensure that this solar innovation can be more easily adopted for other Solar Golf Cars, respectively future versions of the Solar Golf Car. Further steps in the project are to continuously improve the Solar Golf Car mobile app and to develop a new Solar Golf Car design.

Besides that, we want to make a further contribution to the transformation of Gran Canaria into an innovative Smart Green Island. Due to the climatic conditions with a lot of sun and a lot of wind it is perfect as a showcase for innovative Smart & Green Mobility solutions.

Sandwich-Robot: Learning with industrial Robots

The Sandwich Robot Demonstrator was developed during a two-month Summer Internship Program. Involved in the development process was an international and interdisciplinary team of 5 students from the University of Cambridge and the University of Las Palmas de Gran Canaria.

The special feature of the Sandwich Robot project is that the demonstrator consists of several devices and hardware from different companies. The materials were sponsored as part of this educational project. Thus, the Sandwich Robot is composed of a Robot Arm and Delta Robot from the company igus, an XTS Rail from the company Beckhoff, a Delta Robot from the company B&R and Phoenix Contact that acts as one unit.

With the help of the existing industrial hardware, which was provided by the participating companies, innovative solutions can be realized by the students. They can directly program the PLC's of different manufacturers and thus bring the plant to life. By using the latest technologies like the OPC UA protocol, the hardware of different manufacturers can be used, and the plant can communicate beyond its interfaces.

For the user of the Sandwich Demonstrator to receive a finished product, they must customize the sandwich before the manufacturing process. Using an app made specifically for the Sandwich Robot, the operator can first select their own preferred type of bread. Then they can choose their individually desired toppings, as well as the sauce(s). As soon as the user has assembled the sandwich via the app, the Sandwich Robot starts preparing it. In the first step, the igus Robot Arm brings the bread to a rail fixture of the XTS rail, which forwards the bread to two Delta Robots. The Delta Robots then prepare the sandwich with the selected ingredients. Now the sandwich can be removed and eaten by the operator.

With our Sandwich Robot Project we created an opportunity to better prepare young talents for future technologies and to get them excited about technology. In addition, the project is meant to encourage young people to show initiative in solving problems and to develop innovative solutions and ideas in the field of Smart & Green Technologies. Furthermore, such real projects or demonstration plants can be used to make topics such as automation, batch size 1 manufacturing, IoT and robotics more tangible and learnable within a very short time. This way, young people will be able to make their own contributions in the future and develop real smart machines and systems, which in turn will benefit the participating companies.

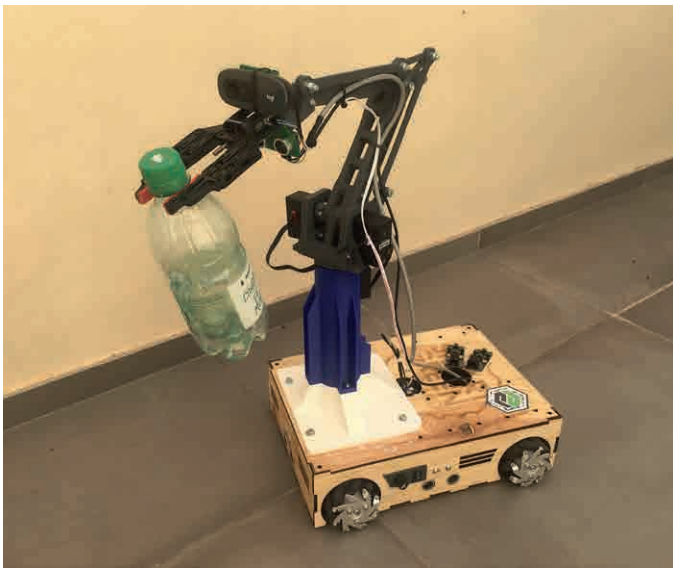
PlastiX: Artificial Intelligence against Plastic Pollution

Besides the climate change, removal of plastic waste from the environment is one of the key ecological challenges and problems of the 21st century. Therefore, we decided to start a project whose main goal is to find suitable and innovative solutions against plastic pollution. During our SMART GREEN ISLAND Summer Camp in September 2019, we developed concepts to solve this problem in an automated and efficient way. This laid the foundation for a smart, innovative, and sustainable project – the so-called PlastiX Project.

The PlastiX mission is dedicated to AI-based detection and automated professional disposal of plastic waste from the environment. The project was developed by an interdisciplinary and international team of 10 young talents. As part of the project a concept of a database for training neuronal networks was created. In addition, the project team developed the first robot prototypes. A total of 7 robots were developed that could be used for various purposes.

With the further developed robot "roBottle", a new mobile robot has been developed to autonomously collect already existing and improperly disposed waste e.g., at the beach or in the forest etc. In addition, the mobile robot will use modern infrastructure and IoT technologies to act autonomously and efficiently with the help of Artificial Intelligence (AI). AI algorithms ensure that the robot can perceive the environment like a human. For this purpose, a camera at the front end of the gripper serves as an eye, with the help of which it can recognize and collect plastic bottles and other environmentally harmful objects. What sounds easy for a human is hard work for a robot. The robot must be able to recognize bottles as such and navigate to them. The collected waste should then be transported to a station that can recycle all or a part of the waste. The robot's chassis was made of plywood and the components of its robotic arm were made of environmentally friendly and compostable PLA. In addition, the robot was equipped with Swedish wheels. After the kinematics were solved, the robot was able to move without mechanical constraints.

Our vision within the PlastiX Project is to unite the topics of digitalization and sustainability and to find efficient solutions regarding the problem of plastic pollution. In order to achieve this goal and to realize our vision, the prototypes of the young talents, which were developed with the help of artificially intelligent systems, should and must be turned into reality in the future. Furthermore, above all our intention is to sensitize young people worldwide to the topics of digitalization and sustainability and to encourage them to actively deal with the problems of today, as well as to find and implement effective innovative solutions for the future in such projects.



Gardenbot: Precision Agriculture of the Future

Our Gardenbot Project is based on a Columbian Smart Farming Project called "FarmBot". It was developed during our first SMART FARMING MAKEATHON 2017 in Bogota, Columbia. This project was realized with the help of an international student team in collaboration with the Columbian University of Los Andes.

The aim of the Gardenbot Project is to investigate various cultivation and management strategies. In addition, we want to better protect plantations from external influences, bad weather conditions and pests in the future, as well as control growth. So with this, a new solution was created that can not only be useful for agriculture, but also for private households. Farmers and consumers can automatically and intelligently manage, monitor, and control their fruits and vegetable beds.

To make this possible, a small test bed was created for the project and the Gardenbot robot was attached to the bed. The attached controller can move autonomously within the bed and carry out processes such as sowing, watering and moisture measurement. Thus, the planting and treatment of the bed can be automated without human labour, so that the consumer only harvests his own crops.

Via an open-source web app, it is possible to keep better track of the harvest. The web app can be downloaded to any computer, tablet, or smartphone with a modern web browser, allowing the user to customize, adjust and control his own plantation at any time and from anywhere. In addition, the user can use the manual control elements to move the Gardenbot and operate its tools and peripherals in real time.

Thus, as an innovative Smart & Green Technology, our Gardenbot has the potential to advance Agriculture 4.0. This technology will increase the yield of fruits and vegetables while conserving resources. For this reason, Agriculture 4.0 is also named as the new precision agriculture of the future. With the help of digitalization and artificial intelligence, technological advances can be made possible in agriculture and innovative concepts can be developed.

In addition to developing effective problem-solving approaches, projects such as the Gardenbot help students to link their theoretical knowledge with practice and thus expand their technological know-how with real projects. The practical implementation enhances an intensive examination of the subject matter and, above all, raises the awareness of young people for global themes such as digitalization and sustainability.

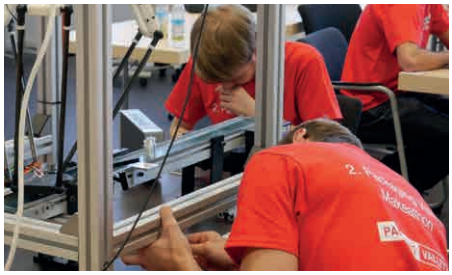
November 2021: Packaging Valley Makeathon

PACKAGING VALLEY

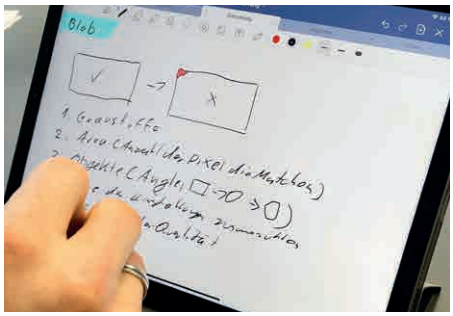
Second Joint MAKEATHON with Packaging Valley e.V., November 09-10











Video Packaging Valley Makeathon
www.youtube.com/ITQGmbH

November 2021: Packaging Valley Makeathon

PACKAGING VALLEY

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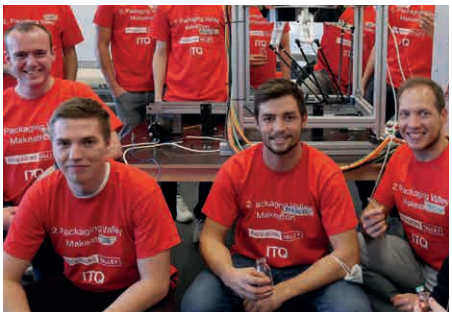
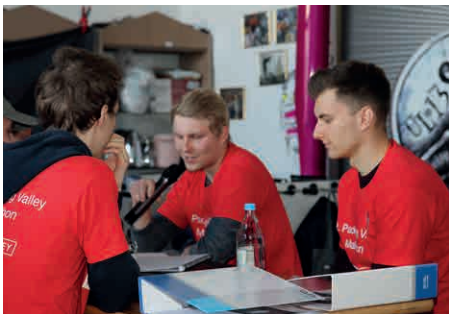


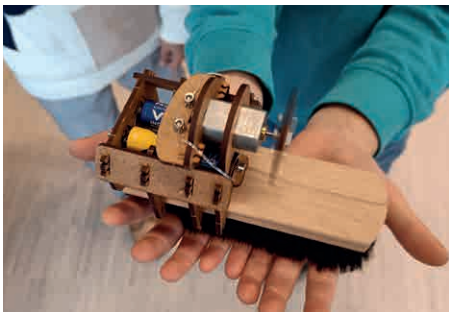


November 2021: VHS Cleaning Robot Workshop

Course with Children at the Adult Education Center (VHS) Unterföhring, November 20







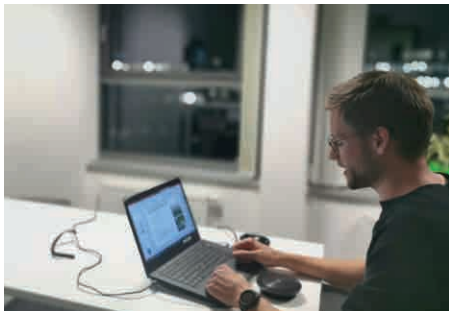


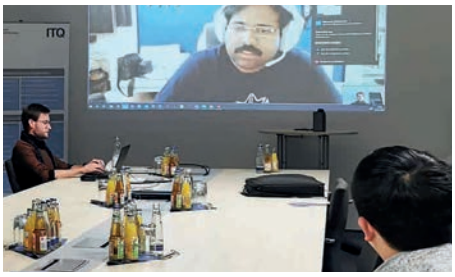


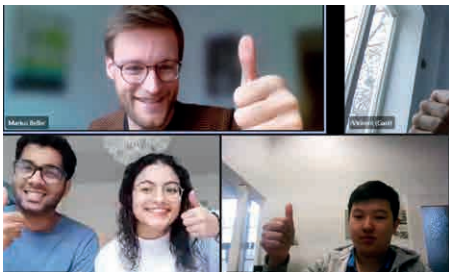


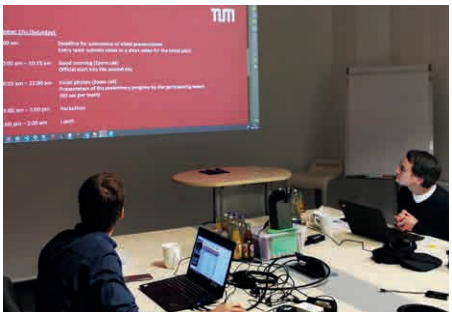

November 2021: TUM Science Hackathon

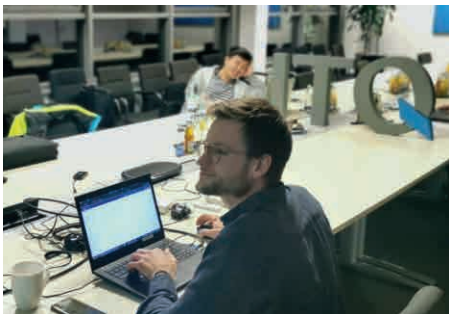
First Participation with own SMART GREEN BIO Challenge at TUM in Garching, November 26-28





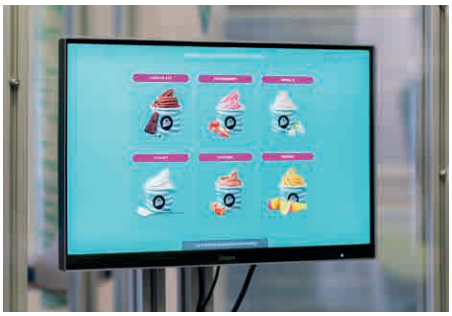


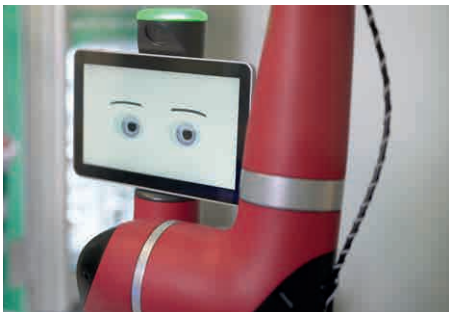


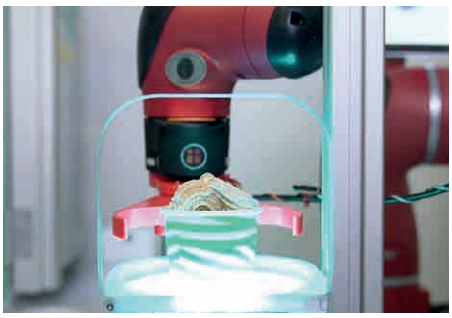


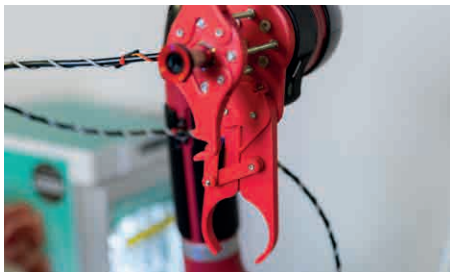
December 2021: Fwip Ice Demonstrator

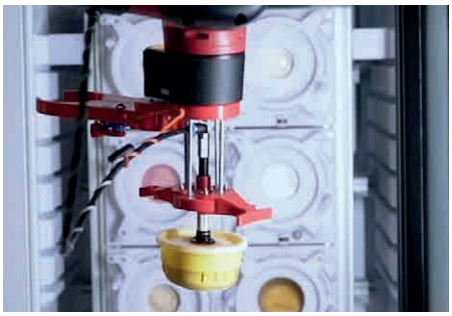
Presentation of the New Education 4.0 Fwip Ice Demonstrator in Garching, December 08



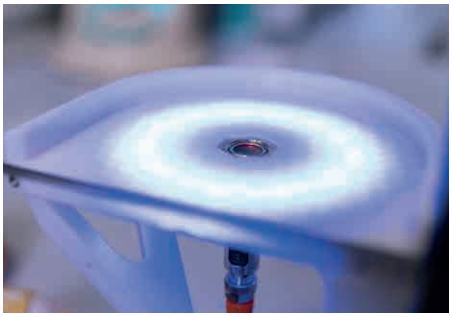


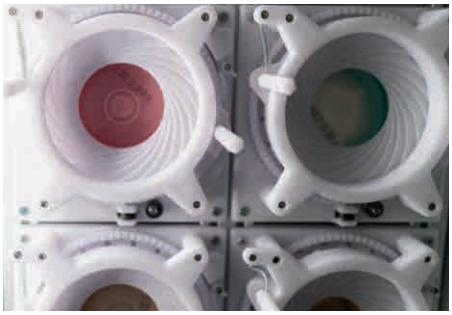






Video Fwip Ice Demonstrator
www.youtube.com/ITQGmbH

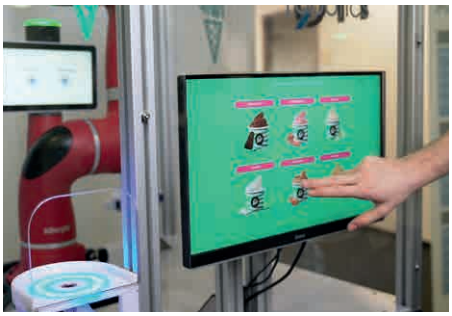
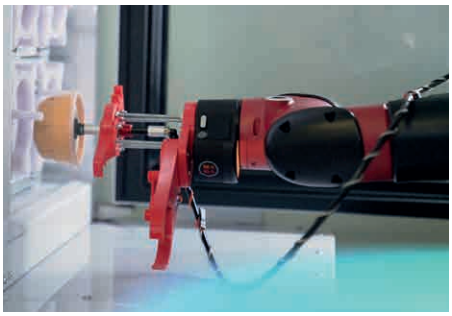
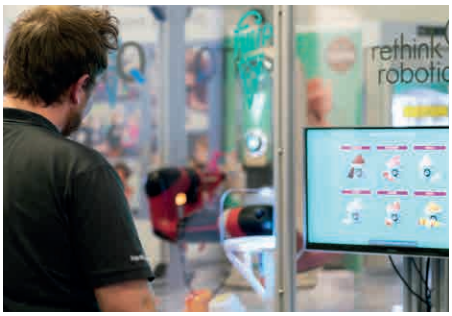
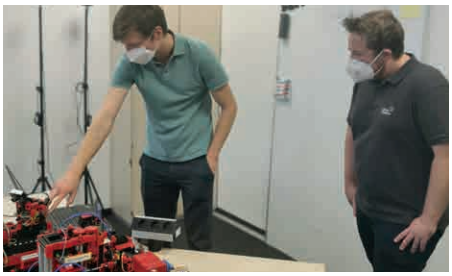
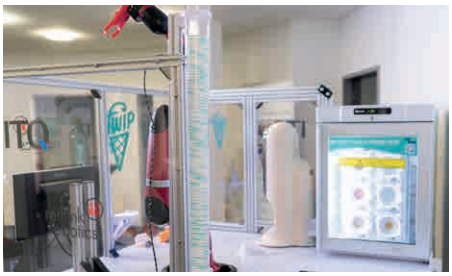




December 2021: Fwip Ice Demonstrator

Presentation of the New Education 4.0 Fwip Ice Demonstrator in Garching, December 08




With the current Education 4.0 project, Fwip Ice Demonstrator, we not only show the possibilities in the area of automation and intelligent collaboration, but also emphasize our constant focus on innovative training concepts.

With the Fwip Ice Demonstrator training project two of our students got the task to controll the ice cream machine by "Fwip" using robotics and software. The prospective engineers programmed the Saywer Rethink robot to automatically run the ice cream machine.

The user selects the desired ice cream flavour via a display. Then the robot arm starts moving and processes the order. With a gripping hand, the arm takes an empty ice cream cup out of the device and puts it under the output of the ice machine.

The robotarm then uses its 3D-printed vacuum Gripper to remove an ice cream cartridge from the specially made cooling fitting and places it in the ice cream machine drawer.

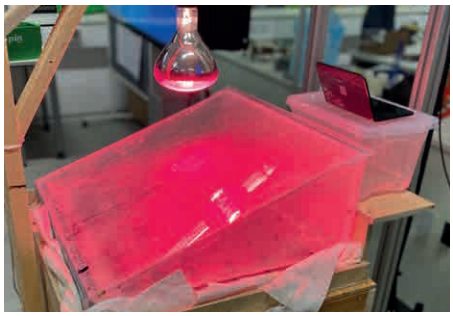
The robot presses the start button and waits for the ice cream machine to prepare.

Finally, the robotic arm removes the finished ice cream and serves it at the dispensing point. The Fwip Ice Demonstrator made its grand entrance at the SPS trade fair in Nuremberg 2022.

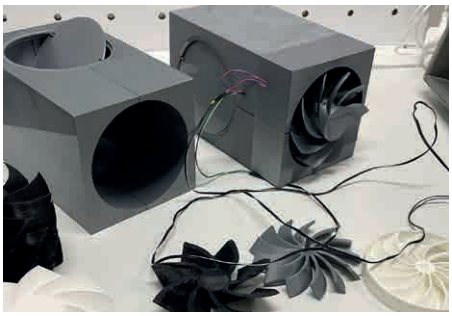
The Year 2022 in Pictures

January 2022: MAKEATHON Rhine-Waal University

MAKEATHON with Rhine-Waal University of Applied Sciences, January 27

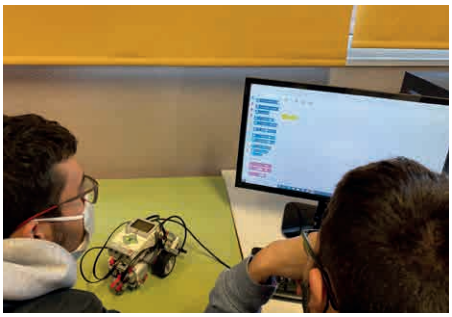


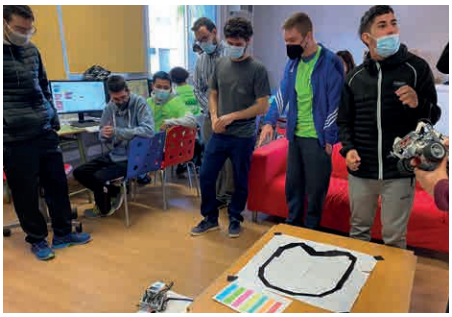


February 2022: LEGO Mindstorms Workshop Gran Canaria

LEGO Mindstorms Workshop with Vocational Students in Gran Canaria, February 02

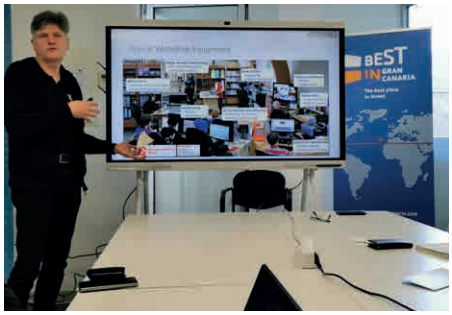






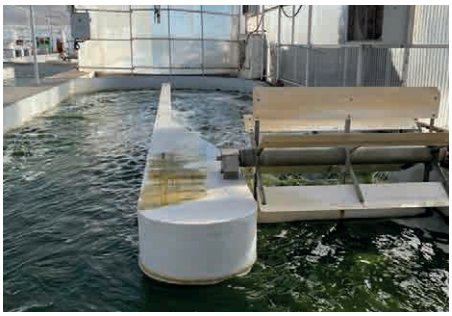
March 2022: Smart Green Innovation Lab Project Gran Canaria

Visit of a German University Delegation of Rhine-Waal University of Applied Sciences, March 07





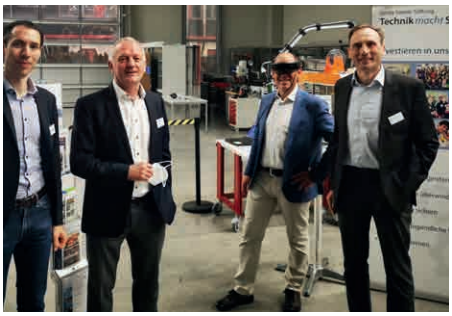



The Year 2022 in Picturess

March 2022: Digital Twin User Forum

Participation in the Digital Twin User Forum in Nördlingen, March 15






March 2022: VHS Cleaning Robot Workshop

Workshop with Children at the Adult Education Center (VHS) Unterföhring, March 19



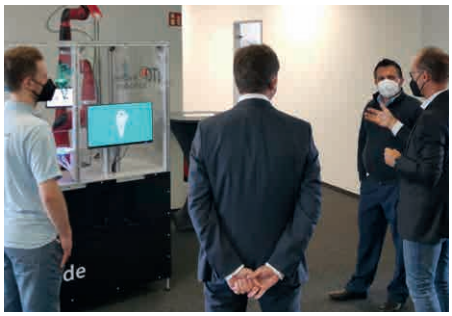


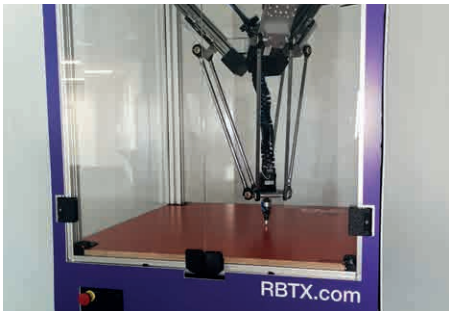
April 2022: VHS LEGO Mindstorms Workshop

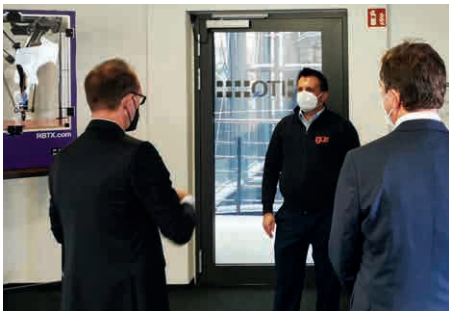
Workshop with Children at the Adult Education Center (VHS) in Unterföhring, April 02

April 2022: Presentation of Education 4.0 Projects

Visit of the Company igus at ITQ in Garching, April 08







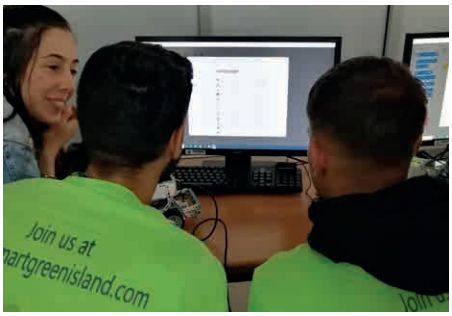
The Year 2022 in Pictures

April 2022: LEGO Mindstorms Workshop Gran Canaria

LEGO Mindstorms Workshop with Vocational Students in Gran Canaria, April 28

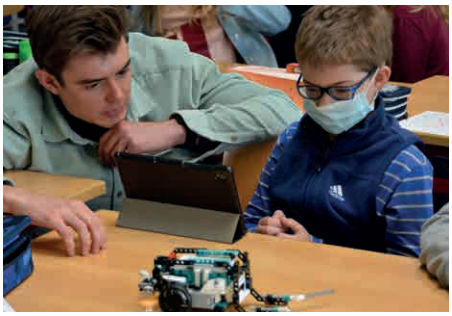




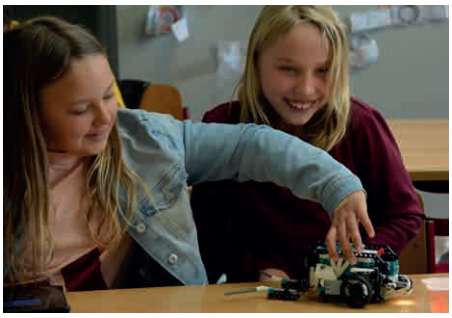



April 2022: LEGO Mindstorms Workshop

Workshop with Pupils at the Secondary School in Dinkelscherben, April 30





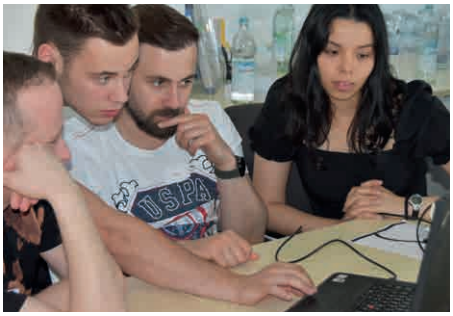


May 2022: Technology Transfer Congress

Grant Award for our Research Project SPIKe at Augsburg University of Applied Sciences, May 04

May 2022: ITQ Student Day

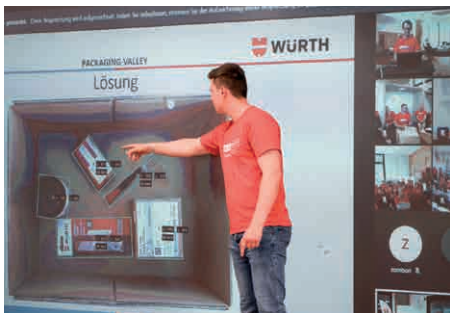
Students gain insight into all aspects of Training at ITQ in Garching, May 18

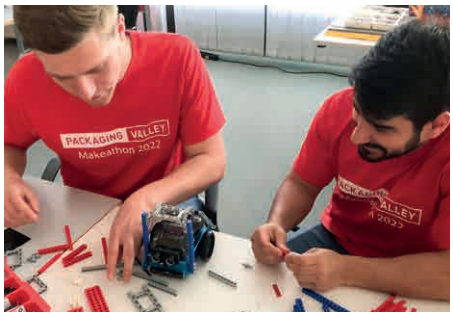


The Year 2022 in Pictures

May 2022: Packaging Valley Makeathon

Third Joint MAKEATHON with Packaging Valley e.V., May 17-18





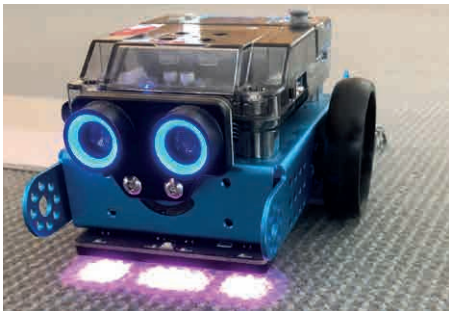
Video Packaging Valley Makeathon auf www.youtube.com/ITQGmbH

May 2022: Packaging Valley Makeathon

Third Joint MAKEATHON with Packaging Valley e.V., May 17-18








5 locations, 5 challenges, 50 participants. And one common goal: Innovative solutions for digital and sustainable processes in the packaging industry. From the 17th until 18th of May 2022, the Packaging Valley hosted, with support of ITQ GmbH, the 3rd Packaging Valley Makeathon.

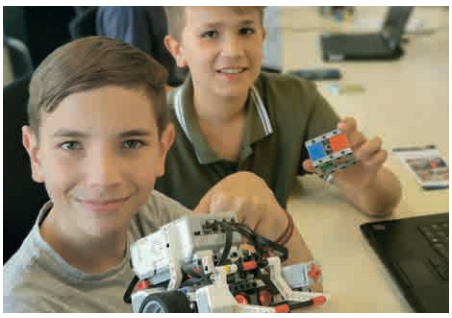
The Young Talents dealt with future-relevant questions about smart solutions for digitalization and resource protection in the packaging industry at locations in Schwäbisch Hall, Waiblingen, Heilbronn, Kempten and Allmersbach im Tal. During two exciting and intense days fresh ideas met with comprehensive know-how of experts in the packaging industry. The interaction between Packaging Valley members, technology partners, institutions, universities and the students brought amazing results and confirmed the innovative strength of teamwork and swarm intelligence.

In an informal and collective creative atmosphere, a special dynamic was created between the participants. A unique opportunity to bring together different ideas and interdisciplinary perspectives, to try out industry-relevant solutions under real-life conditions and to be courageous in breaking new ground in digitalization and sustainability.

It's nice to see how our original idea of MAKEATHONS is carried forward and our approach of Education 4.0 continues to grow.

May 2022: LEGO Mindstorms Workshop

Workshop with Ukrainian Refugee Children at ITQ in Garching, May 20







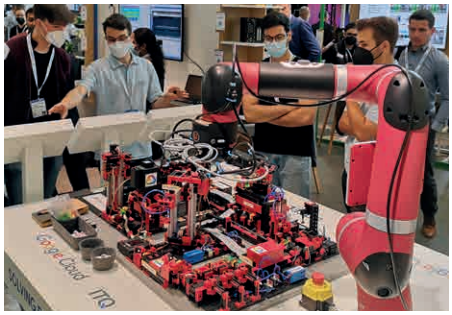
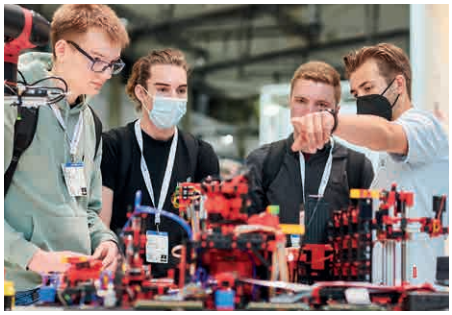
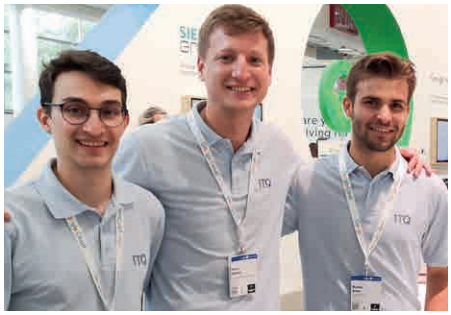
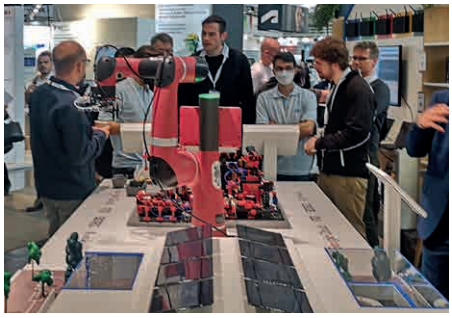
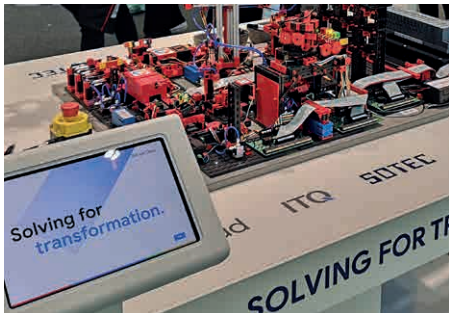


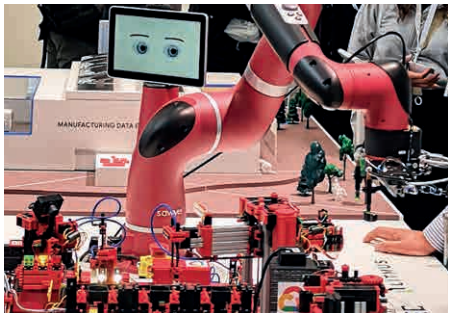




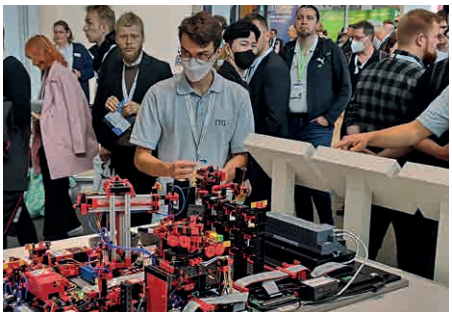
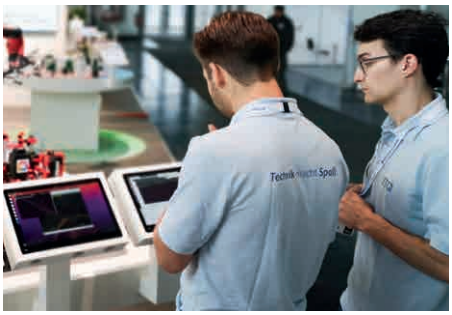
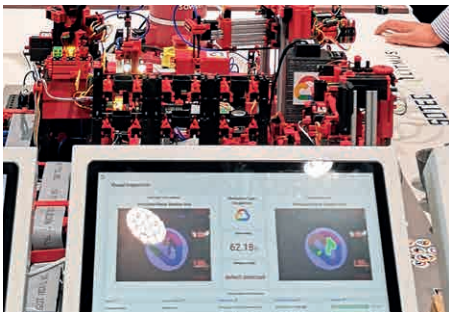
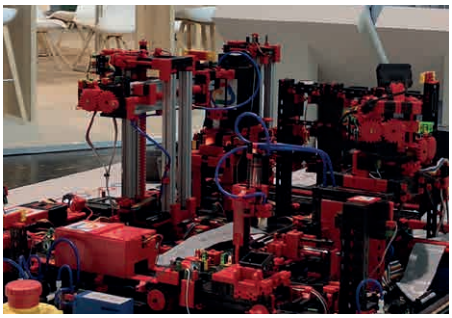
May 2022: Google Cloud Demonstrator

Student Project Google Cloud Demonstrator at the Hannover Messe, May 30 - June 02





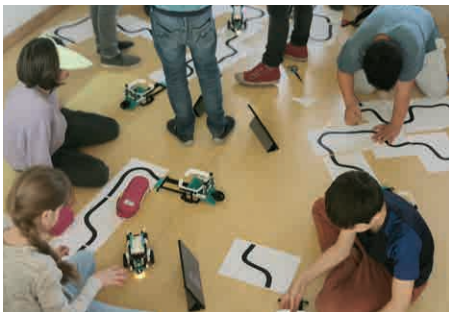






The Year 2022 in Pictures

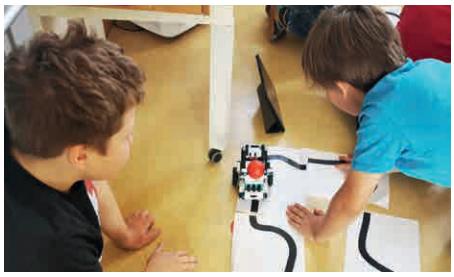
June 2022: LEGO Mindstorms Workshop

LEGO Mindstorms Workshop with Pupils at the Farinelli School in Munich, June 03





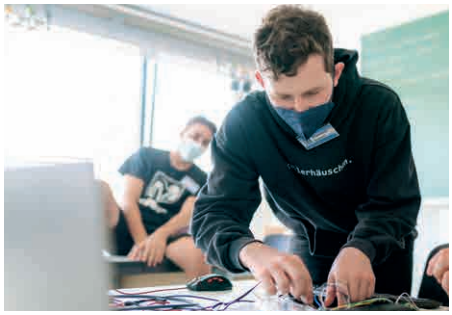


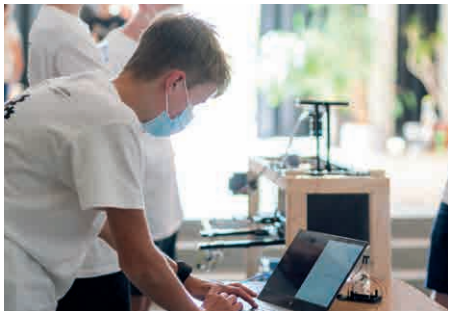




June 2022: Pupils Makeathon Höchstadt

Third Pupil MAKEATHON at Gymnasium Höchstadt in Erlangen, June 13-17













The Year 2022 in Pictures

June 2022: Visit of the University of Botswana

Visit of a Botswana University Professor at ITQ in Garching, June 13





June 2022: Visit of Business France Germany

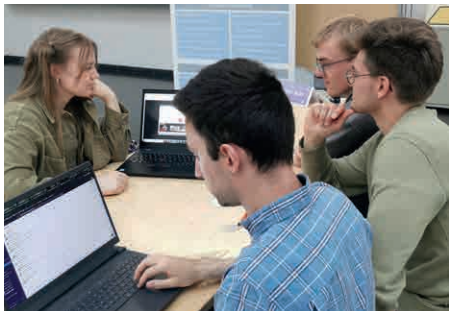
Visit of a Delegation of French Companies at ITQ in Garching, June 22

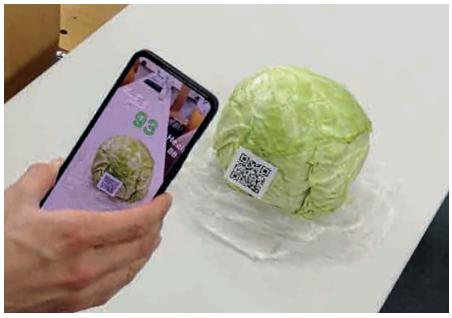


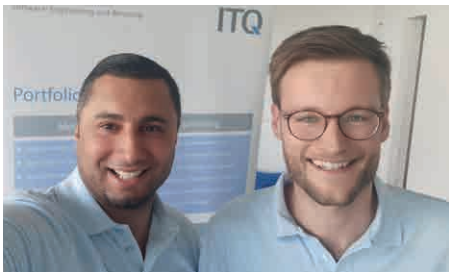


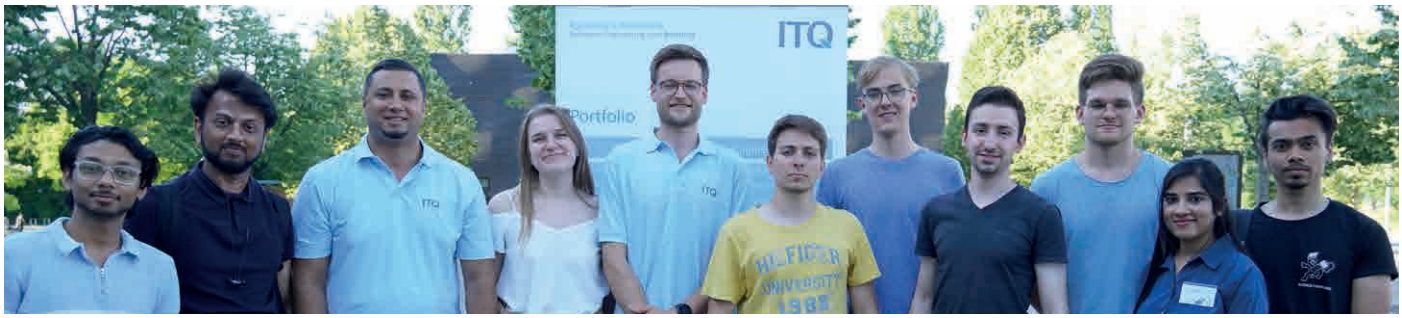

June 2022: TUM Science Hackathon

Second Participation with own SMART GREEN BIO Challenge at TUM in Garching, June 24-26









The Year 2022 in Pictures

August 2022: Summer Camps Gran Canaria

Coaching of ITQ Employees at the Dr. Stetter ITQ Smart Villa on Gran Canaria, August/September

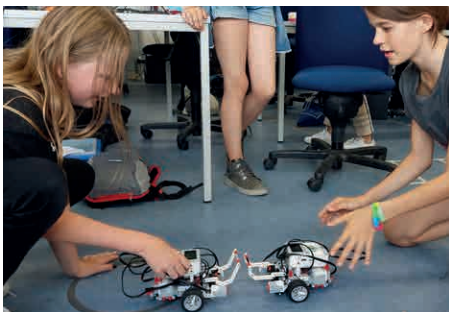
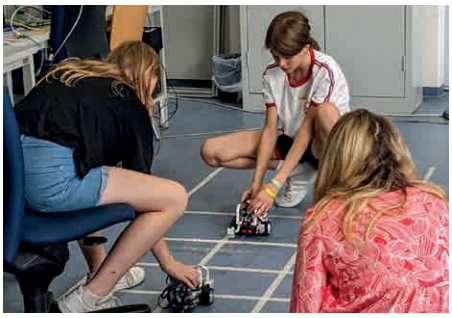




August 2022: LEGO Mindstorms Workshop

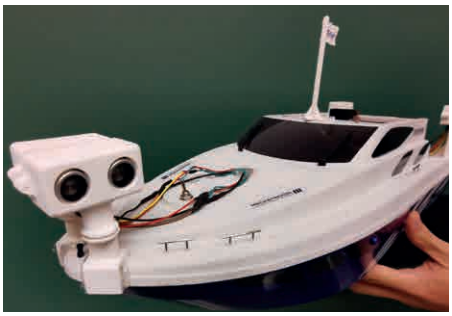
LEGO Mindstorms Workshop with Pupils at TUM in Garching, August 17-18



September 2022: Prototyping of Autonomous Model Boats

Block Seminar Planning and Development of Mechatronic Products, September 23



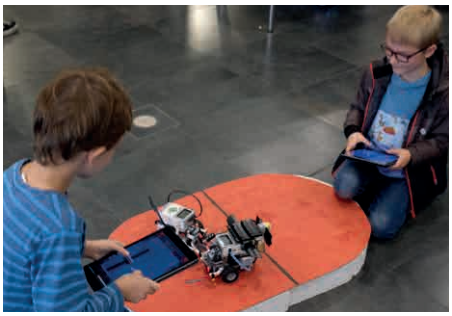
September 2022: Engineering Day

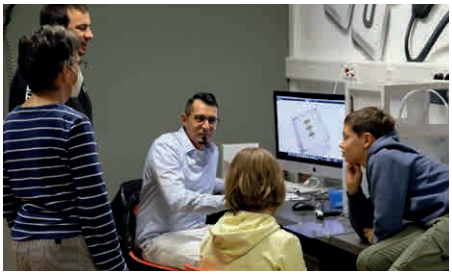
Open Day at the University of Duisburg-Essen in Duisburg, September 30

The Year 2022 in Pictures

September 2022: Maker Day with the City of Duisburg

Action Day on Digital Do-It-Yourself in Duisburg, September 24





After 2 years of online streaming, the Maker Day finally took place again in person on September 24th in Duisburg. For the 7th time experts from universities and various schools in Duisburg as well as representatives of IT companies, start-ups and associations showcased their current projects.

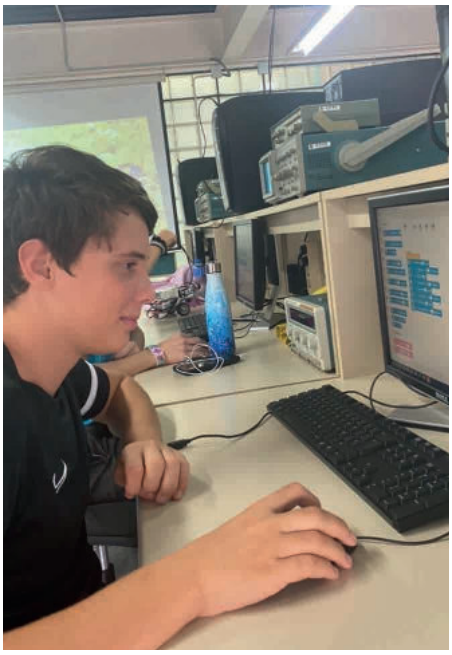
Whether robots or smart home solutions, aspects of sustainability and environmental protection, the Maker Day offers all young people the opportunity to learn about various aspects of getting to know the "making", lend a hand and create things.

This year there were many hands-on activities about digitalization, 3D printing and robots and their programming. At the same time, the young people were shown professional perspectives and were able to network with companies. We were there for the 4th time and were able to present our latest training project "Smart Solar Panels".

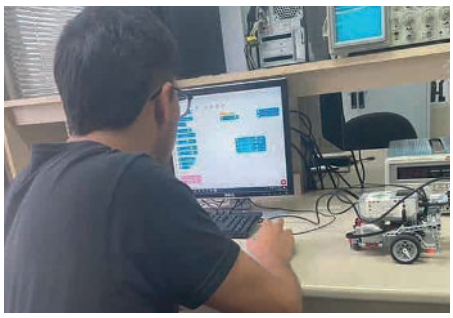
The demonstrator was developed and implemented by two working students. The solar panels rotate automatically with the light source and the structure offers many opportunities for further mechatronic (teaching) concepts to implement. The model was very popular and invited to lively discussions. We had a lot of fun being part of the Maker Day once again and to bring our Education 4.0 approach and the design of a sustainable future closer to the participants.

October 2022: LEGO Mindstorms Workshop Gran Canaria

LEGO Mindstorms Workshop with Vocational Students on Gran Canaria, October 04

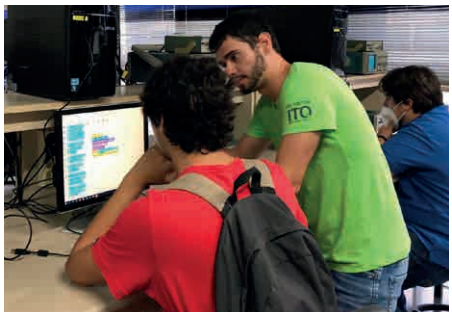


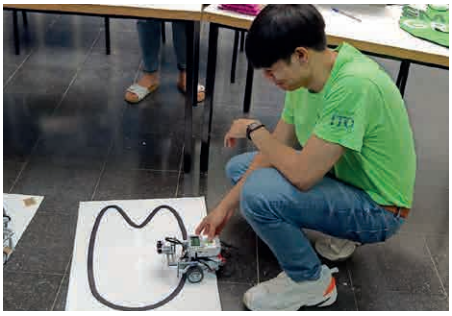




October 2022: LEGO Mindstorms Workshop Gran Canaria

LEGO Mindstorms Workshop with Vocational Students on Gran Canaria, October 05






The Year 2022 in Pictures

October 2022: VHS Cleaning Robot Workshop

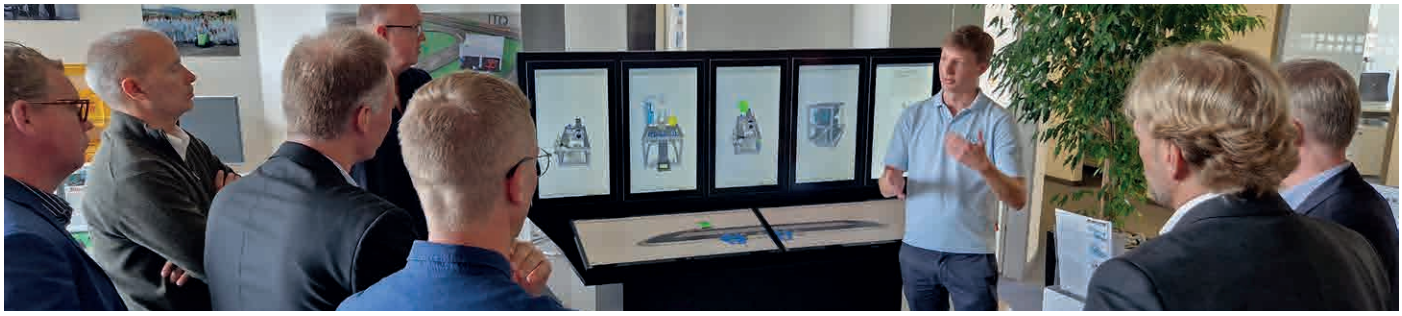
Cleaning Robot Course at the Adult Education Center (VHS) Unterschleißheim, October 15



October 2022: Visit to the Danish Industry Association

Visit of a Danish Company Delegation at ITQ in Garching, October 06

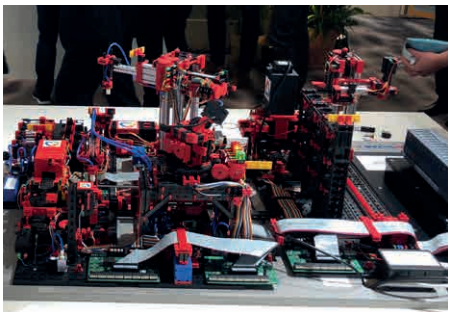


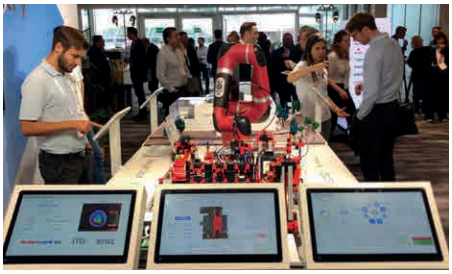



October 2022: Google Cloud Demonstrator

Student Project at Google Cloud Next '22 in Munich, October 13-17

Google Cloud Next '22





To illustrate the principle of the latest Google Cloud Solution Manufacturing Data Engine and Connect to a wide audience, our junior engineers built a Google Cloud demonstrator together with SOTEC.

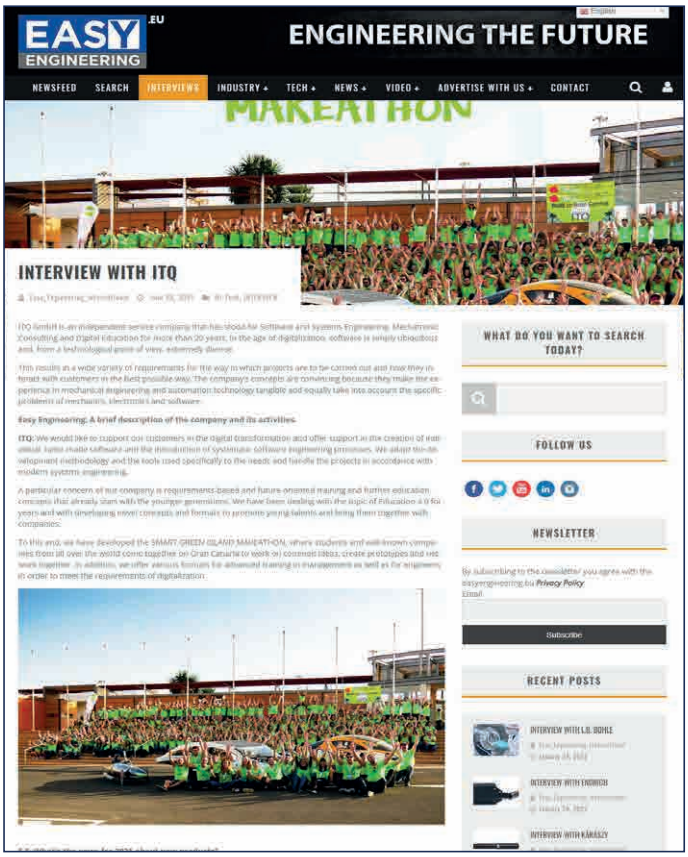
The demonstrator consists of a miniature factory for individualized chip production and shows how processes and productivity can be optimized with the help of the AI-based solution.

The demonstrator is intended to illustrate in a playful way how manufacturing engineers can receive all data of a smart factory with cloud technologies and how to efficiently process it. It is based on the Learning Factory 4.0 from fischertechnik and a "Sawyer-Cobot" from Rethink robotics. For the demo, a chip individualized with a colored pen is built in.

The workpiece is checked via the visual inspection and brought to the warehouse. The cobot then hands over again the customized chip. An output display presents all central process data of the chip. After scanning a QR code the chip's individual process data are available from the Google Cloud directly on the smartphone or tablet.

The demonstrator had already made it´s big appearances at the Google booth at the Hannover Messe 2022 and at the global flagship event, the Google Cloud Next ´22.

Press Review



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MAKEATHON

INTERVIEW WITH ITQ

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Reference: Easy Engineering, June 28, 2021

2. PACKAGING VALLEY MAKEATHON

Wirtschaftsförderung Region Stuttgart

09.11.2021, 09:00 Uhr - 10.11.2021, 17:00 Uhr

Student am Standort Syntegon beim Arbeiten an einem Prototyp (Quelle: PV)

Nachdem der 1. Packaging Valley Makeathon im letzten Jahr mit einer tollen Bilanz durchgeführt wurde, findet der **2. Packaging Valley Makeathon** unter der Schirmherrschaft von Packaging Valley Germany e.V. mit Unterstützung der Fa. ITQ GmbH und in Zusammenarbeit mit der Wirtschaftsförderung Region Stuttgart, dem Digital Hub Heilbronn-Franken (hfcon) sowie der XR-Week vom Virtual Dimension Center Fellbach am **09.-10. November 2021** dezentral statt. An verschiedenen Orten treffen sich Studierende, Start-ups, Fachkräfte aus Unternehmen und Technikbegeisterte, um gemeinsam an Lösungen für Digitalisierung und Nachhaltigkeit im Verpackungsmaschinenbau zu tüfteln, zu entwickeln und zu arbeiten. Über digitale Plattformen sind alle Beteiligte miteinander vernetzt und präsentieren am Ende ihre Ideen, Lösungen und Entwicklungen.

Digitaler Schub für Verpackungsmaschinen und mehr Nachhaltigkeit

Die Corona-Krise hat in vielen Bereichen von Wirtschaft und Gesellschaft den tatsächlichen Stand der Digitalisierung schonungslos aufgezeigt.

Auch Verpackungsmaschinenhersteller wurden durch die Situation der Reisebeschränkungen, Maßnahmen zur Vermeidung der Ausbreitung des Virus und den Einschränkungen bei Inbetriebnahme und Service auf eine neue Art und Weise herausgefordert. Gleichzeitig werden die Produkte und Dienstleistungen der Branche massiv benötigt, um die Versorgung der Bevölkerung u.a. mit Lebensmitteln und pharmazeutischen Produkten sicherstellen zu können.

Krisen können ein Katalysator für bestimmte Entwicklungen sein und so bietet auch die Corona-Krise die Möglichkeit, dass es einen digitalen Schub im Verpackungsmaschinenbau gibt. Im Rahmen des Packaging Valley Makeathon steht die Frage im Mittelpunkt, welche Weiterentwicklungspotenziale sich der Branche im Bereich von Digitalisierung und Mechatronik bieten, welche Konsequenzen sich aus der

Reference: Wirtschaftsförderung Region Stuttgart, November 11, 2021

LATEST

WEEKLY NEWS ROUNDUP

PAST MACHINE WITH SOFTWARE

FUTURE SOFTWARE WITH MACHINE

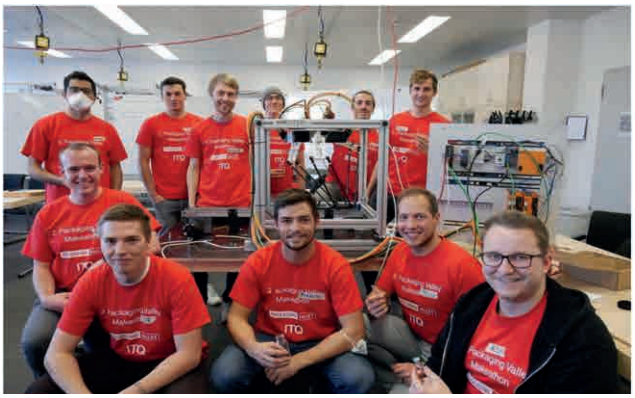
Reference: Easy Engineering, June 28, 2021

Hochschule Kempten University of Applied Sciences

06.12.2021

2. Packaging Valley Makeathon

Studierende der Fakultät Elektrotechnik entwickeln innovative Lösungsansätze, um Störungen im Betrieb von Verpackungsmaschinen automatisiert zu erkennen und zu beheben.



Team des 2. Packaging Valley Makeathon

Auch in der 2. Auflage des Packaging Valley Makeathon galt es wieder innovative Lösungsansätze für Aufgaben aus Industrieunternehmen zu finden.

Die Aufgabe der Fa. SYNTEGON, einem Hersteller von Verpackungsmaschinen, bestand darin, Störungen, die im Betrieb von Verpackungsmaschinen auftreten, automatisiert zu erkennen und zu beheben. Elf Studierende aus den Studiengängen Robotik, Wirtschaftsingenieurwesen und Automatisierungstechnik und Robotik haben sich dieser Herausforderung gestellt und in den zwei Tagen Lösungen - begonnen von der Ideenfindung bis hin zu einem funktionierenden Demonstrator - entwickelt. Am Ende konnten sie den anderen Teilnehmenden und der Fa. Syntegon einen Demonstrator präsentieren, in dem ein Roboter mit entsprechend angepasstem Greifer die Störungen automatisiert beheben konnte. Unterstützt wurde die Lösung durch KI basierte Bildverarbeitungssysteme, die von der Fa. IDS GmbH eigens für den Makeathon zur Verfügung gestellt wurde. Fehlermuster konnten so erkannt und Roboter entsprechend angesteuert werden.

Reference: University of Applied Sciences Kempten, December 06, 2021

TECHNIK UND WISSEN
DAS FACHMAGAZIN FÜR DIE INDUSTRIE

DIE TREFFSICHERE DARTSCHEIBE

Wenn Bildverarbeitung mit Machine Learning im Spiel wäre

(Bild: Silvan Arnet, Unsplas

Mit dem Studienprojekt «Treffsichere Dartscheibe» zeigte die TU München schon vo
5 Jahren die Möglichkeiten schneller Bildverarbeitungssysteme auf. Im Gespräch
mit Dr.-Ing. Rainer Stetter über das Projekt, dessen Herausforderungen und wie sich
n diesem Bildverarbeitung mit Machine Learning vorteilhaft nutzen liesse.

mathematisch ganz einfach über die Physik definieren. Alternativ nutzt man hierfür Machine Learning und lässt die Spieler in einer Simulation gegeneinander spielen und lernt so ganz ohne Physik, wie auf eine Situation reagiert werden muss.

Bei diesem Ansatz des bestärkenden Lernens zeigte sich übrigens, dass der so entwickelte virtuelle Gegner sehr viel besser war als der programmierte. Das liegt daran, dass die physikalischen Gesetze immer den idealen Zustand abbilden, während bei Machine Learning ausserdem das Erfahrungswissen mit ins Programm einfliesst.

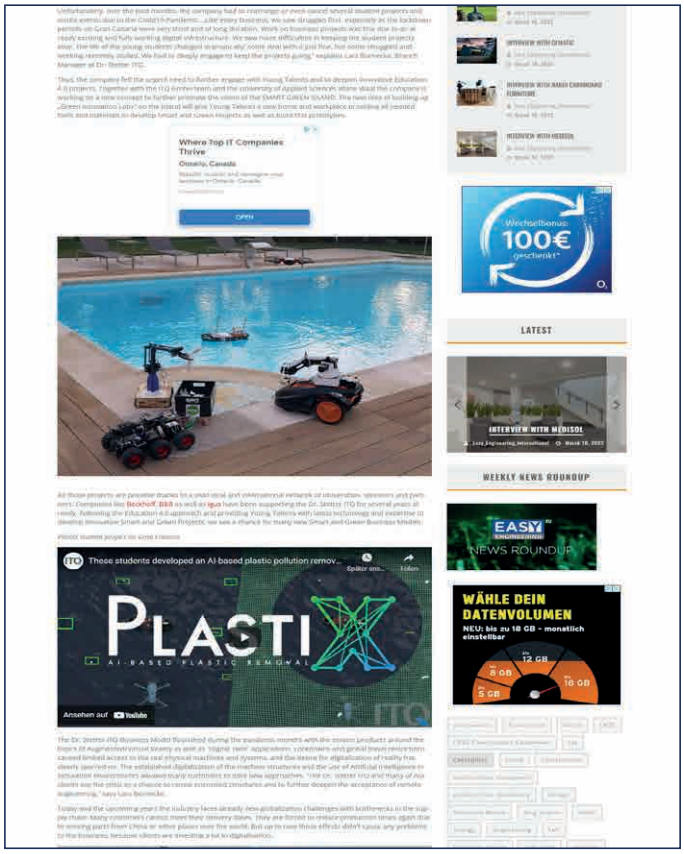
Historisches Bild der treffsicheren Dartscheibe mit Michael Glos, dem damaligen deutschen Minister für Wirtschaft und Technologie. (Bild: TU München)

Potenzial und Grenzen von Machine Learning

Wo sehen Sie für Machine Learning das grösste Potenzial?

Wir lernen in der Hochschule immer die idealen Gleichungen, doch unser Leben durchzieht sich hauptsächlich mit nicht linearen, partiellen Differenzial-Gleichungen. Nun haben die allermeisten Menschen allein schon mit dem Wortkonstrukt «nicht lineare, partielle mehrdimensionale Differenzial-Gleichungen» ein Problem, weshalb diese komplexen Bewegungsgesetze approximiert oder linearisiert werden. Wenn man nun Mechanismen hat, die sich mathematisch nur schwer beschreiben lassen, lässt sich durch

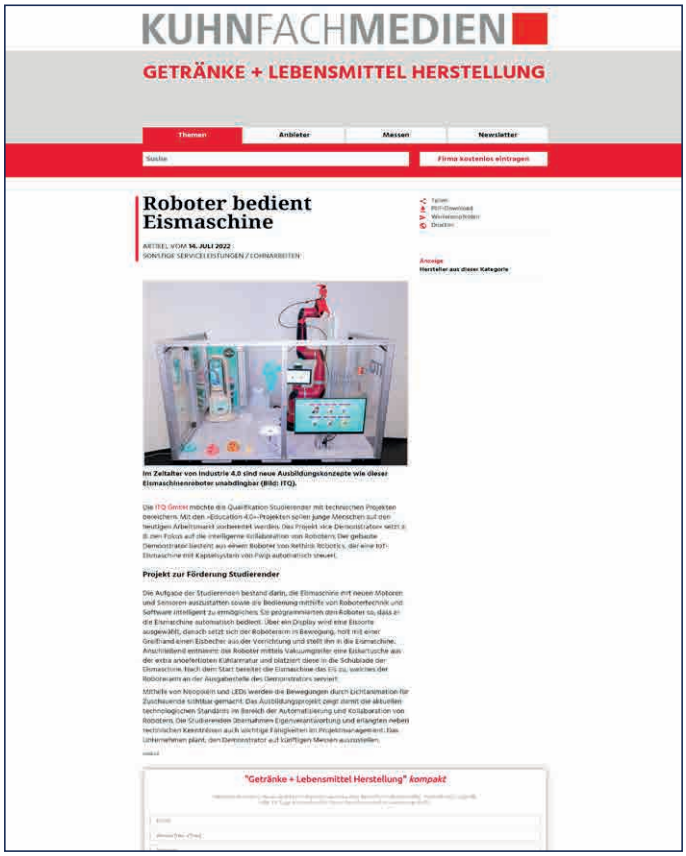
Reference: Technik und Wissen Magazin, February 02, 2022



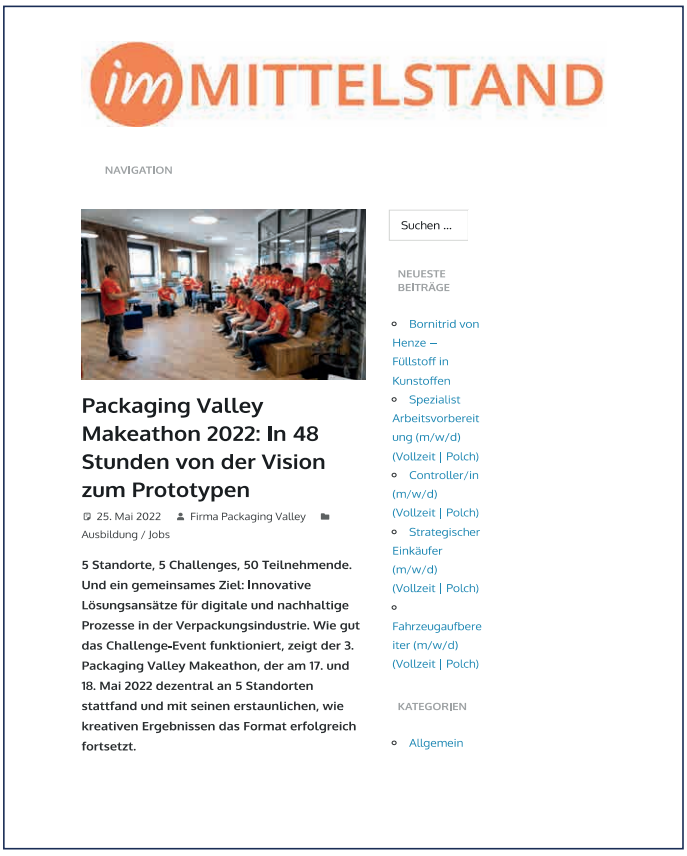
Reference: Easy Engineering, February 23, 2022

Press Review

Reference: Robotik und Produktion, March 28, 2022



Reference: Kuhn Fachmedien, Getränke + Lebensmittel Herstellung, July 14, 2022



Reference: Mittelstand, May 25, 2022

Reference: Elektronikpraxis, July 28, 2022

Quelle: Easy Engineering, August 05, 2022

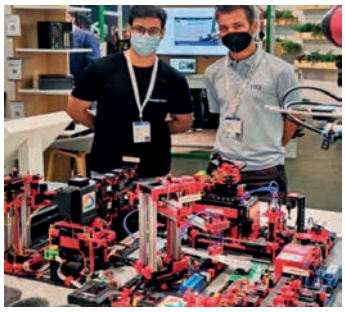
CLOUDCOMPUTING INSIDER

Education 4.0 für Industrie 4.0

Google-Cloud-Fabrik in Fischertechnik aufgebaut

11.08.2022 | Von Johann Wiesböck

ITQ hat einen Demonstrator auf Basis von Fischertechnik entwickelt, der die Google Cloud für industrieller Fertigung veranschaulicht. Die Minifabrik wurde erstmals auf der Hannover Messe gezeigt.



Der Google-Cloud-Demonstrator auf der Hannover Messe 2022
(Bild: ITQ)

Die intelligente Fertigung stellt eine große Bereicherung dar, wenn Ingenieure sämtliche Daten effizient nutzen können. Die neuste Google-Cloud-Lösung Manufacturing Data Engine and Connect macht genau dies möglich. Um das Prinzip der Google Cloud für ein breites Publikum zu veranschaulichen, hat die ITQ GmbH, als Experte für Software und Systems Engineering, gemeinsam mit Sotec, Lösungsanbieter zur Digitalen Transformation, einen Google-Cloud-Demonstrator gebaut. Der Demonstrator zeigt am Beispiel einer Miniaturfabrik zur individualisierten Chipherstellung, wie sich Prozesse und die Produktivität mit Hilfe der KI-basierten Lösung optimieren lassen.

Reference: Cloudcomputing Insider, August 11, 2022

MASCHINENMARKT

Google-Cloud-Fabrik in Fischertechnik aufgebaut

08.08.2022 | Von Johann Wiesböck

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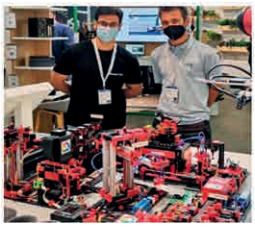

Der Google-Cloud-Demonstrator auf der Hannover Messe 2022
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Den ersten erfolgreichen Einsatz absolvierte der mobile Google-Cloud-Demonstrator auf der diesjährigen Hannover Messe. Insgesamt haben sechs Junior Engineers der ITQ GmbH gemeinsam mit Kollegen von SOTEC innerhalb von fünf Monaten den Demonstrator gebaut. „Das Projekt ist ein weiterer Meilenstein unseres Education 4.0-Ansatzes. Wir ermöglichen jungen Menschen, an hochanspruchsvollen Projekten eigenverantwortlich zu arbeiten. So wollen wir dem Nachwuchs ermöglichen, eine nachhaltige Zukunft eigenständig zu gestalten", erklärt Dr. Rainer Stetter, Geschäftsführer der ITQ GmbH.

Der Demonstrator veranschaulicht auf spielerische Weise, wie Fertigungsingenieure mit den Cloud-Technologien von Google sämtliche Daten einer Smart Factory erhalten und effizient weiterverarbeiten können. Die Ingenieure bauten den Demonstrator basierend auf der Lernfabrik 4.0 von Fischertechnik sowie einem Sawyer- Cobot von Rethink Robotics auf. Dabei erfahren die Anwender die Funktionsweisen von Analytics & Insights, Visual Inspection, Predictive Maintenance, Anomaly Detection sowie Traceability einer intelligenten Fertigung.

Reference: Maschinen Markt, August 08, 2022

INDUSTRY OF THINGS
MISSION MANUFACTURING

Education 4.0

Google-Cloud-Fabrik in Fischertechnik aufgebaut

20.08.2022 | Von Johann Wiesböck

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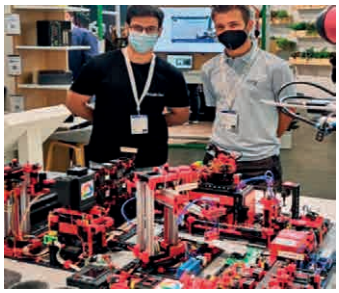

Der Google-Cloud-Demonstrator auf der Hannover Messe 2022
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Reference: Internet of Things, August 20, 2022

Get on Board!

Become a Technology Sponsor

When the foundation was established in 2011, we had the ambitious vision that every school and kindergarten in Germany would have a technology club by 2021. Much has changed in the meantime in the age of digitalization, but there is still a long way to go before we reach our goal. We already offer our "LEGO Mindstorms" project in many institutions and teach the students technical contexts with a lot of fun to get them excited about science and technology at an early age.

Our concept is to introduce teams of pupils to technical problems in a playful way using the high-tech LEGO Mindstorms construction kit. The organizational and technical leadership of these teams is taken over by students selected and trained by us. Fun and play are never neglected. To ensure that the teams are not just "playing" but are actually working in a focused and concentrated manner, the foundation repeatedly supports selected teams in their participation in competitions such as the First LEGO League or the international robotics competition World Robot Olympiad. This year, we supported pupil teams in five national and international competitions and were even able to send two teams from the Bavarian Ottobrunn High School to the World Finals in Detroit and Montevideo.

To push this concept further, we are always looking for companies that, together with us or on their own initiative, build up and support further school teams and enable them to participate in specially organized competitions.

If you as a sponsor, company or private person, would like to support the activities of the Gerda Stetter Foundation with financial means, donations of materials and its influential network, please feel free to contact us.

On behalf of a new technophile generation, we are happy about every commitment!
If you want to donate money, we will give you a donation receipt.
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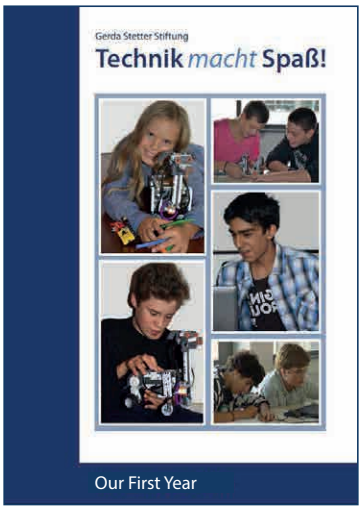
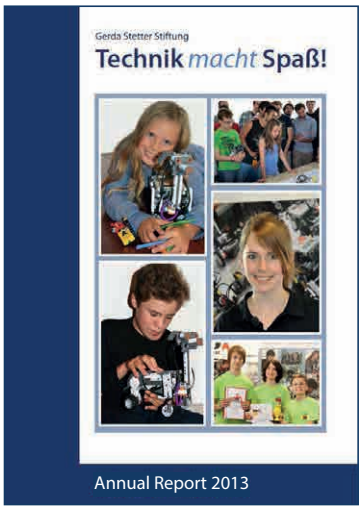
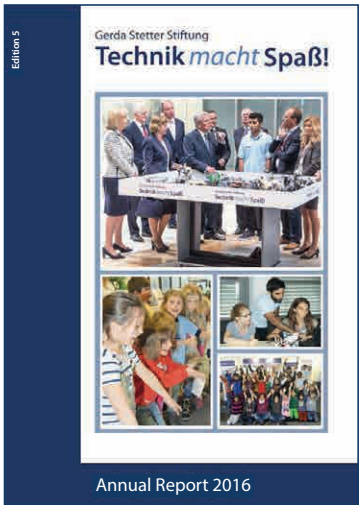
Edition Review – What we did so far

Our Goal is to teach Education 4.0 with a lot of Enthusiasm ...

Front Cover – Event Highlights 2012 – 2020/2021

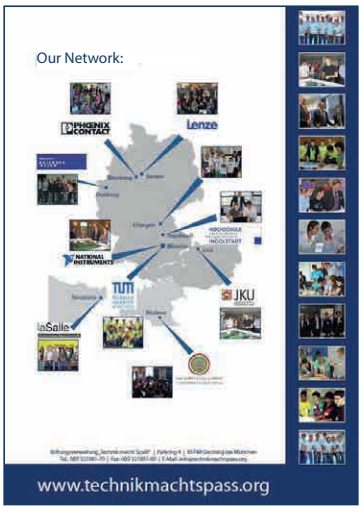






... and we have achieved a lot so far

Network 2012 – 2020/2021



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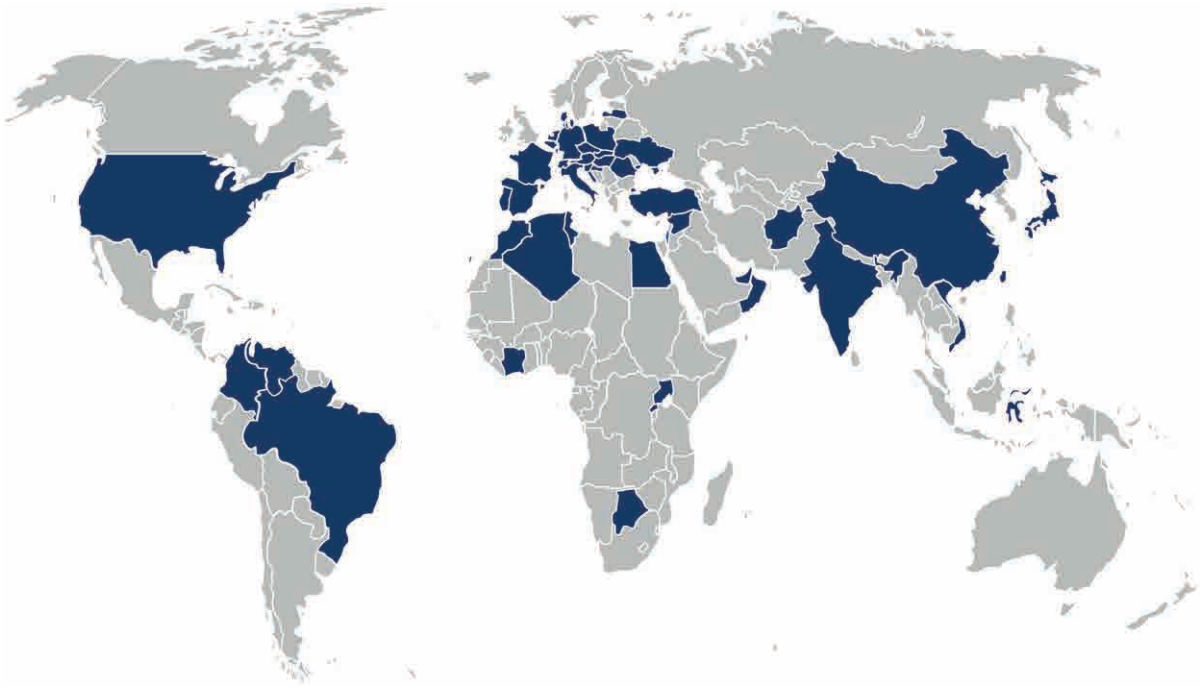

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