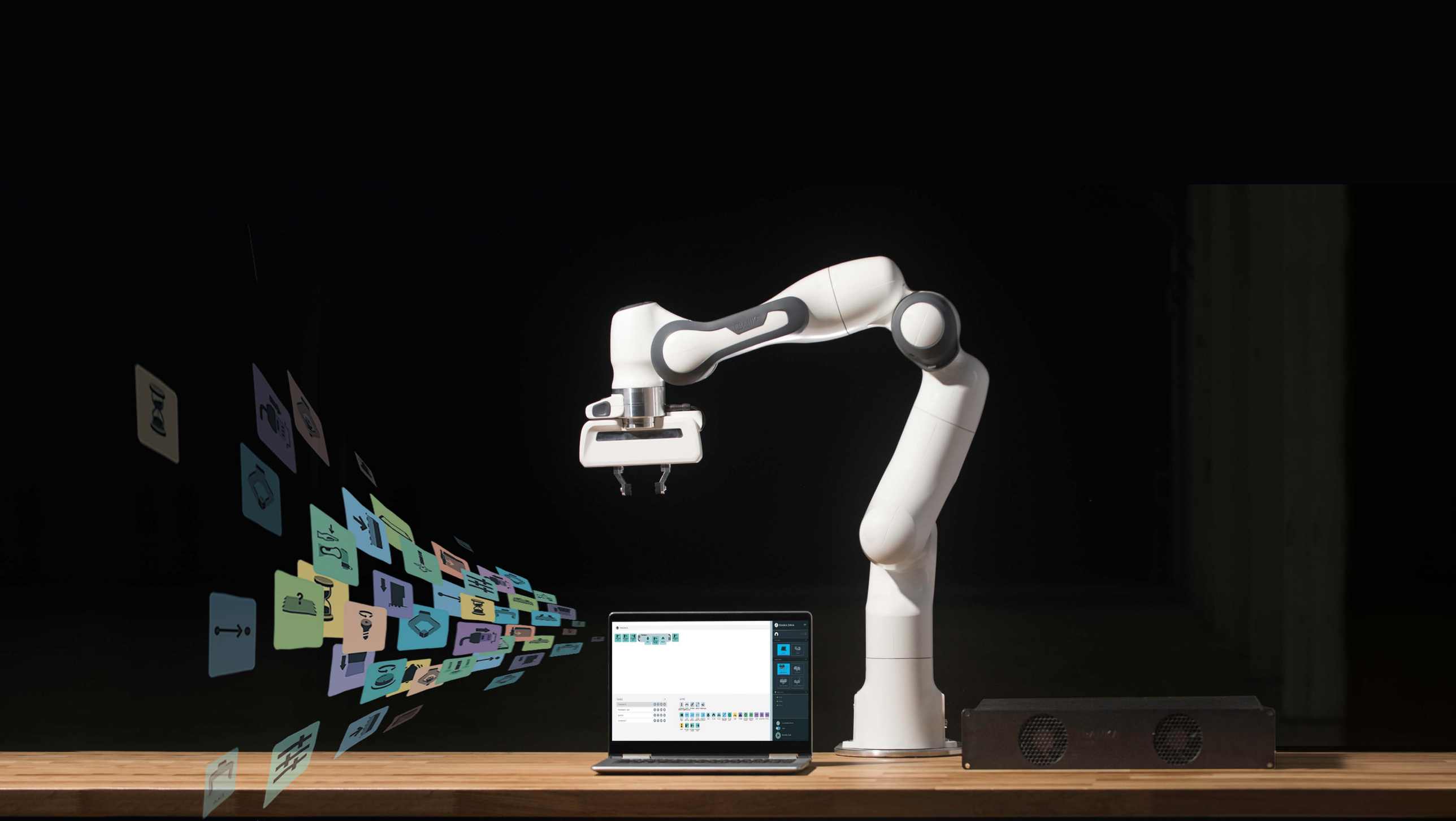


FRANKA EMIKA

Franka Emika HQ Munich

Franka Emika GmbH

Our vision of a robot for everyone – sensitive, interconnected, adaptive and cost-efficient.

Even today, robotics remains a technology accessible only to few. The reasons for this are the high costs, difficult programming and the separation of humans and robots by safety fences. So how can this technology be made accessible to the general population?

We at Franka Emika GmbH, a young high-tech company from Munich, want to solve this problem. To us, the ideal robot of the future is a tool which can be used by anybody and which supports humans in carrying out unpleasant or even dangerous tasks. Panda is the first system of an entirely new generation of tools, which are developed as research robots, as colleagues in factories, and ultimately, as assistants in daily life for elderly or sick people.

We received the Deutscher Zukunftspreis by Federal President Frank-Walter Steinmeier in November 2017 for our first product, the sensitive and easily programmable robotic arm.

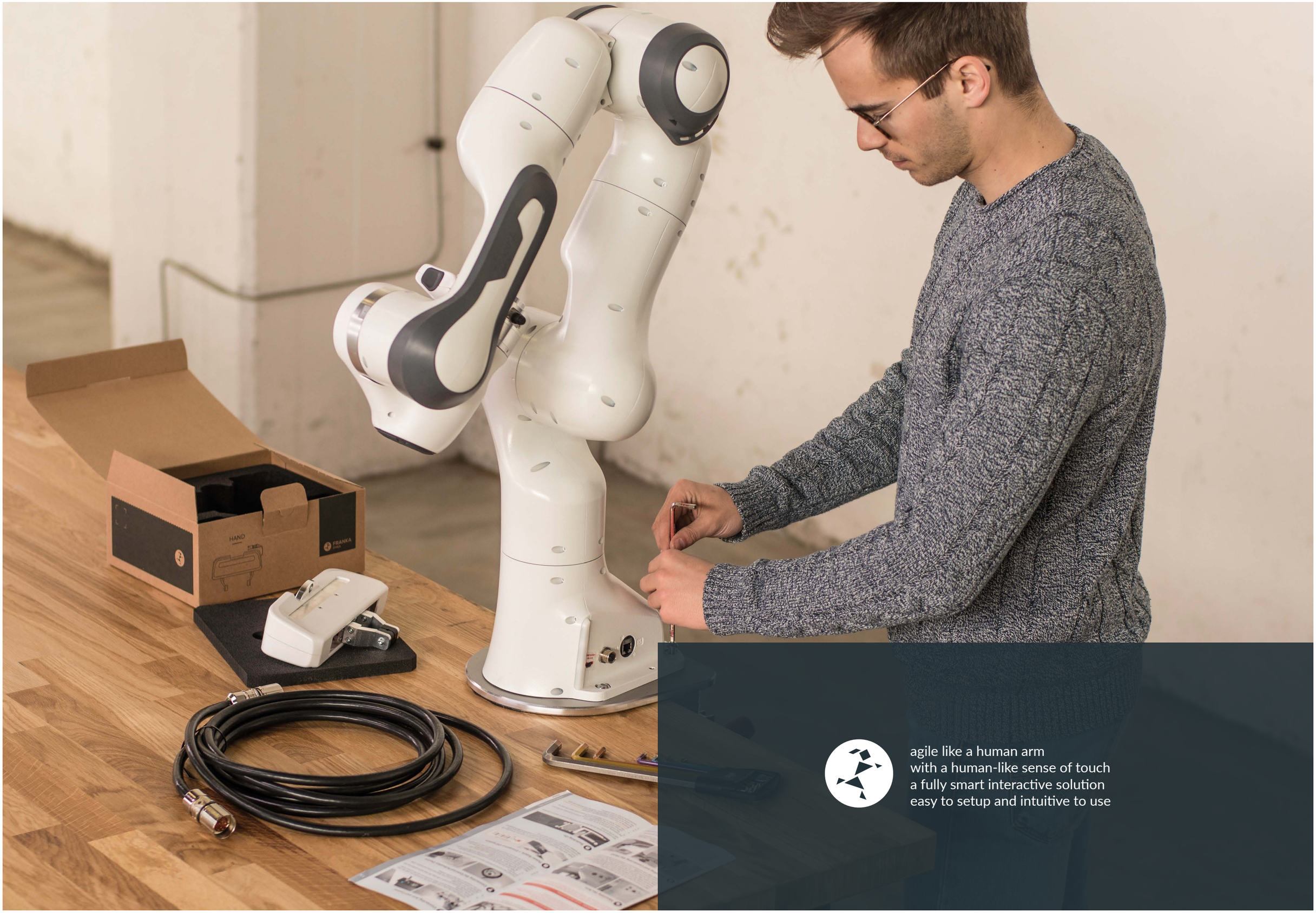
The system can be operated via Apps like a smartphone and be taught new Tasks within a few minutes, without requiring any programming skills. At the same time the system is sensitive to such an extent, that it can take over assembling, testing or inspection tasks.

The online platform Franka World is the center of the ecosystem, where the community will be able to exchange ideas and developers will get assigned to customers allowing them to introduce new solutions and applications.

The system was developed based on the globally leading German robot technology, and is now produced in series in Bavaria, Germany.

Designed, developed and made in Germany.

Gerd Hirzinger, the most recognized pioneer in robotics and the first researcher to receive every international robotics and automation award, says, "Worldwide, robotics researchers are convinced that sensitive torque controlled robots are the future; in particular when considering the large scale future topics such as robotic assistance, safe human-robot collaboration in production or service robotics. Interestingly, this novel technology was often considered to be far too complex to be realized. However, the Franka Emika robot is the perfect exemplar of the synergies between mechatronics and digitalization in the context of Industry 4.0, and I believe it is the long yearned for breakthrough."



agile like a human arm
with a human-like sense of touch
a fully smart interactive solution
easy to setup and intuitive to use

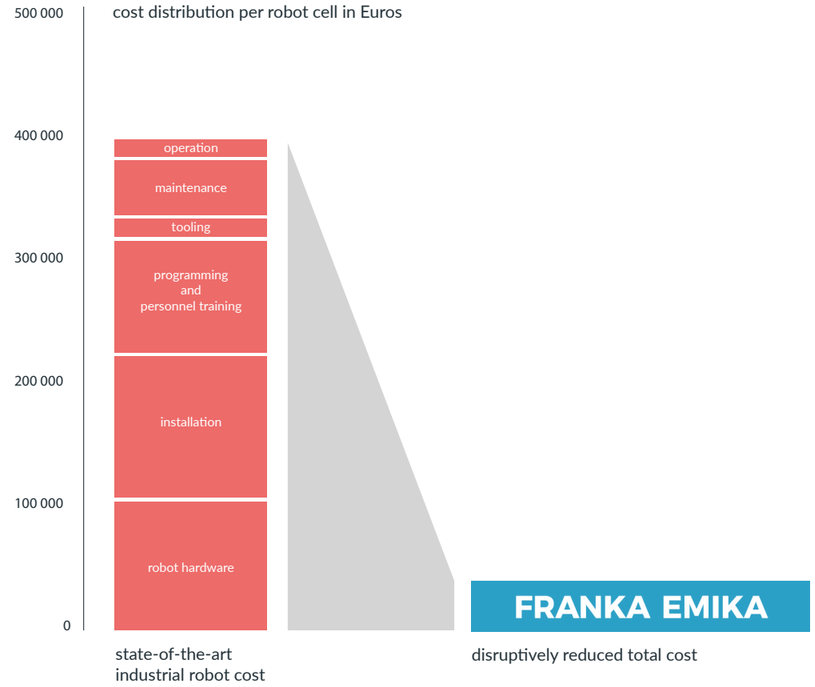
INDUSTRIES SEEK ROBOTIC SOLUTIONS

Unprecedented areas of application and new markets for intelligent robot assistants are emerging. However, nowadays all industries still face the restrictions of the current state-of-the-art robotic technology in manufacturing and assembly:

- Integration, programming and tooling is **too expensive and extremely time consuming**.
- Solutions are custom-made and **lack reusability and adaptability**. Consequently, investment is project specific and cannot be depreciated over several projects.
- **Complicated** programming procedures **limit accessibility** as industries depend on highly skilled experts with increasingly short product life cycles.
- The current robotic solution costs **cannot compete with labor costs** at production sites.
- **Deployment by existing staff** at the production facility is not possible.
- **Lack of sensitivity** severely limits the robot's product assembly capabilities.
- **Safety fences are very expensive**, take up a lot of valuable workspace and restrict the accessibility of the production space and **limit the flexibility** of the application.

TOWARDS COMMODITY AUTOMATION

For all the good reasons.



Democratization of automation:

The ideal robot of the future can be used by everyone and assists people by reliably and quickly executing unpleasant or even dangerous tasks. The democratization of such a key technology can only take place when the solution is powerful, affordable, flexible and globally available.

Panda: The robot for everyone – sensitive, interconnected, adaptive and cost-efficient.

DEUTSCHER ZUKUNFTSPREIS
Preis des Bundespräsidenten für Technik und Innovation

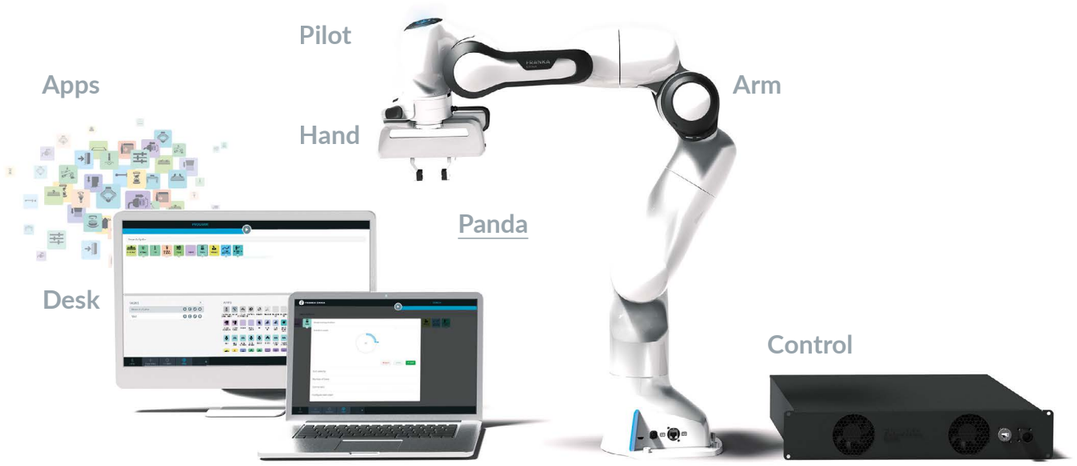
2017 Award Winners

What makes Panda revolutionary?

Human-like capabilities
High resolution sensitivity in all 7 joints for robust assembly
High perfomance operation
Complete workspace covering kinematics and excellent precision

Smartphone-like programming within minutes
Using modular and reusable powerful Robot Apps
Cloud connection for global access
Runs on any web-browser

Disruptively low hardware, software and integration cost
Useable and accessible for everybody
Flexible shopfloor integration in no time
Effortless multi robot deployment



Technical Data

Arm: The Arm is inspired by the agility of the human arm. It is a sensitive and extraordinarily versatile power tool. The torque sensors in all seven axes enable Panda to skillfully and delicately manipulate objects.

degrees of freedom	7 DOF	mounting flange	DIN ISO 9409-1-A50
payload	3 kg	installation position	upright
sensitivity	joint torque sensors in all 7 axes	weight	18 kg
maximum reach	855 mm	protection rating	IP30
Cartesian velocity limits	up to 2 m/s end effector speed	ambient temperature	15 - 25 °C (typical)
repeatability	+/- 0.1 mm (ISO 9283), even improves by using sensitivity features	air humidity	20 % to 80 % non-condensing
interfaces	Ethernet (TCP/IP)		

Control: The slim 19“ Control unit can be mounted in server racks or placed anywhere else. It connects Panda to the cloud or to your local shopfloor network.

interfaces	Ethernet (TCP/IP) for Internet/network-connection
controller size (19“)	355 x 483 x 89 mm (D x W x H)
supply voltage	100 V_{AC} - 240 V_{AC}
mains frequency	47 - 63 Hz
power consumption	max. 600 W; average: ~ 300 W
active power factor correction (PFC)	yes
weight	~ 7 kg
protection rating	IP20
ambient temperature	15 - 25 °C (typical)

Pilot: Pilot is the direct user interface on the Arm. It provides quick-buttons to customize the Apps and to execute their features in Desk.

Hand: The Hand can grasp firmly and quickly for high performance and flexible pick and place. The fingers can be exchanged to optimally grasp a wide variety of objects.

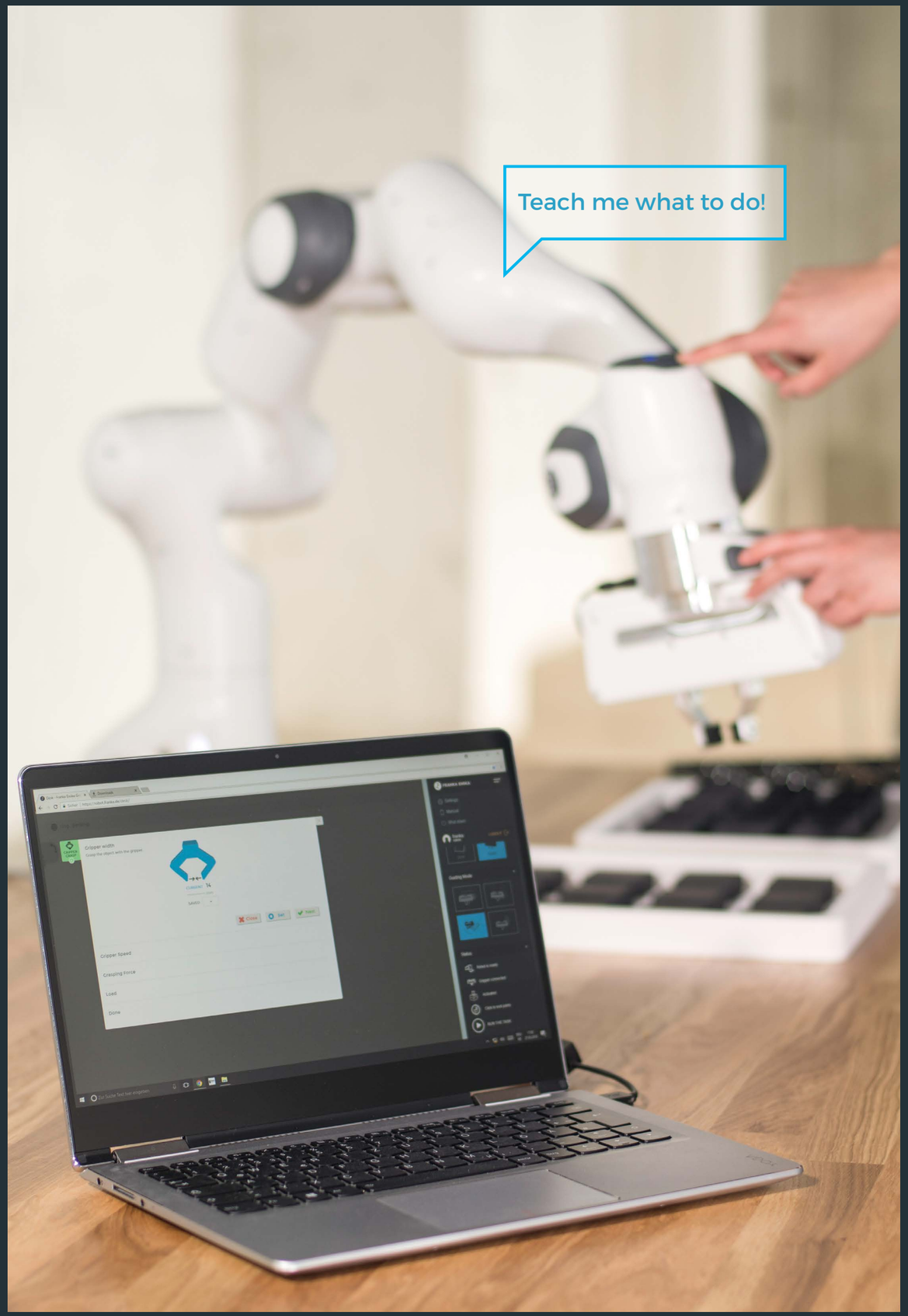
parallel gripper	with exchangeable fingers
grasping force	force up to 70N
travel (travel speed)	80 mm (30 mm/s)

Desk: A Task can be set up in Desk by arranging different Apps, which are then parametrized directly in the work area.

Apps: Apps are modular Robot programs and always represent a partial step of a Task. Each App contains a context menu in which the user is lead through the process parameters interactively.

World: The online platform Franka World is the center of the ecosystem, where the community will be able to exchange ideas and developers will get assigned to customers allowing them to introduce new solutions and applications.

FCI: It is Franka Emika‘s tailor-made response to the needs of training and research institutions. It has an open interface (FCI) that is programmable via C++ and ROS.



Installation and Task creation in no time.

Panda can be set up extremely quickly. After delivery, it takes only a few minutes to install, run and write your own programs. Once completed, deployment of the same configuration is almost instantaneous.

1 Single box delivery

2 Quick setup

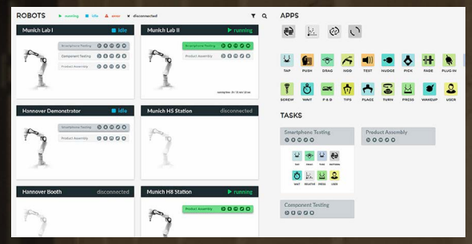
10 minutes

3 Easy programming

10 minutes

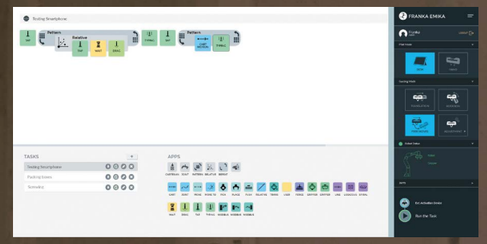
4 Load a Task

Load the Task from the Franka Cloud and deploy it on your Panda or open it from your Desk Library.



5 Create or re-arrange a Task

Add, delete or re-arrange Apps according to your needs.



6 Train and test

Teach positions by taking Panda by the hand. Adjust the Apps and edit parameters by using the Pilot guided by a step-by-step dialog...

...test your Task in original speed within your station...

...re-teach if necessary.

7 Deploy your robots

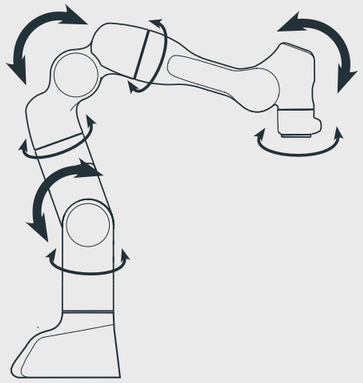
and let them work automatically

Lean back and think about next Tasks for Panda.

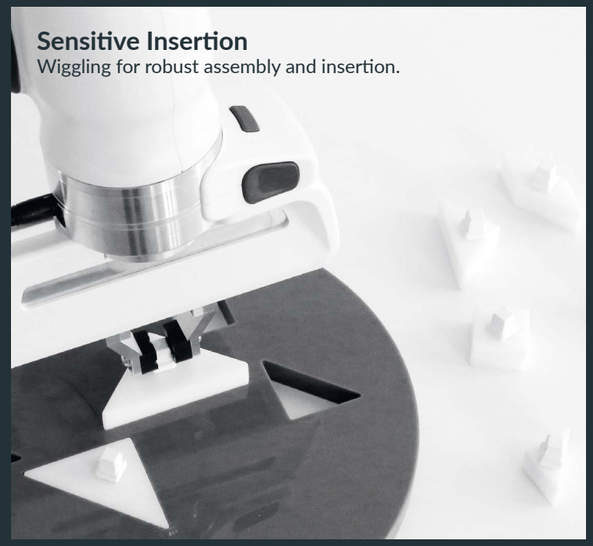
Joint torque controlled with a sense of touch

Panda is a first-generation, collaborative robot system designed specifically to assist humans. The complete modularity, ultra-lightweight construction, highly integrated mechatronic design, sensitive torque sensors in all joints, and human-like kinematics, make the system unique. Based on the „soft-robotics-control“, inspired by human beings, Panda is able to recognize and process even the slightest touch by using its artificial reflex system to react within milliseconds.

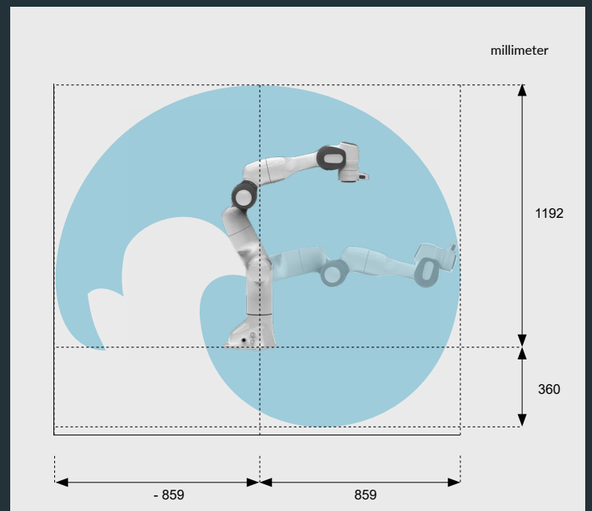
7 degrees of freedom
Agile and sensitive like a human arm.



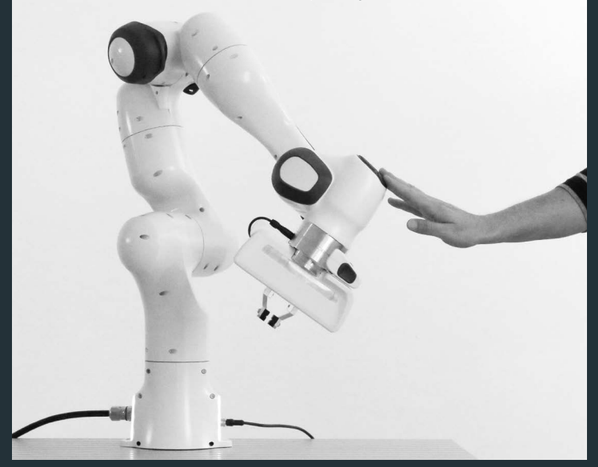
Sensitive Insertion
Wiggling for robust assembly and insertion.



Repeatability
Positional repeatability in every direction.



Collision vs. Interaction
Most accurate contact detection, interpretation and reaction.

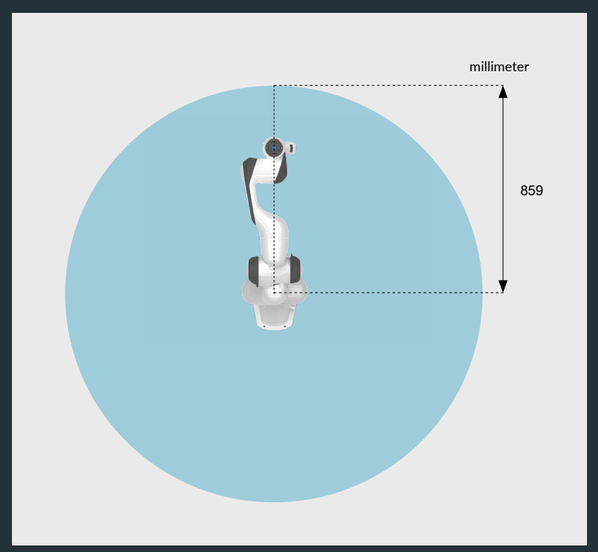


PANDA IS UNIQUE

Torque controlled with a sense of touch

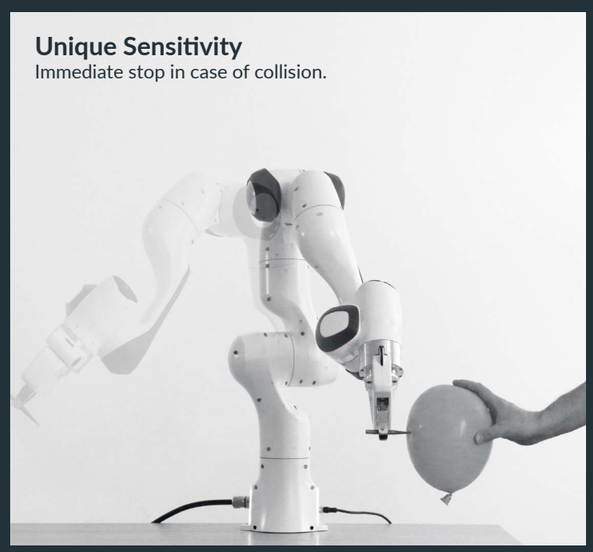
Wide-range workspace

Close-range workspace, even near the base



Follow contures
Precise, agile and weightless with soft robotics control.

Unique Sensitivity
Immediate stop in case of collision.



Learning Capability

Today's Artificial Intelligence(s) and Machine Learners are able to analyze large data volumes, to recognize patterns and to draw conclusions. However, physical interaction with the real world is still a challenge. Existing robotic systems are massive mechanical positioning machines that simply cannot feel, because they are not made for interaction with the world. Franka Emika is born with this ability and through learning it expands its skill set.

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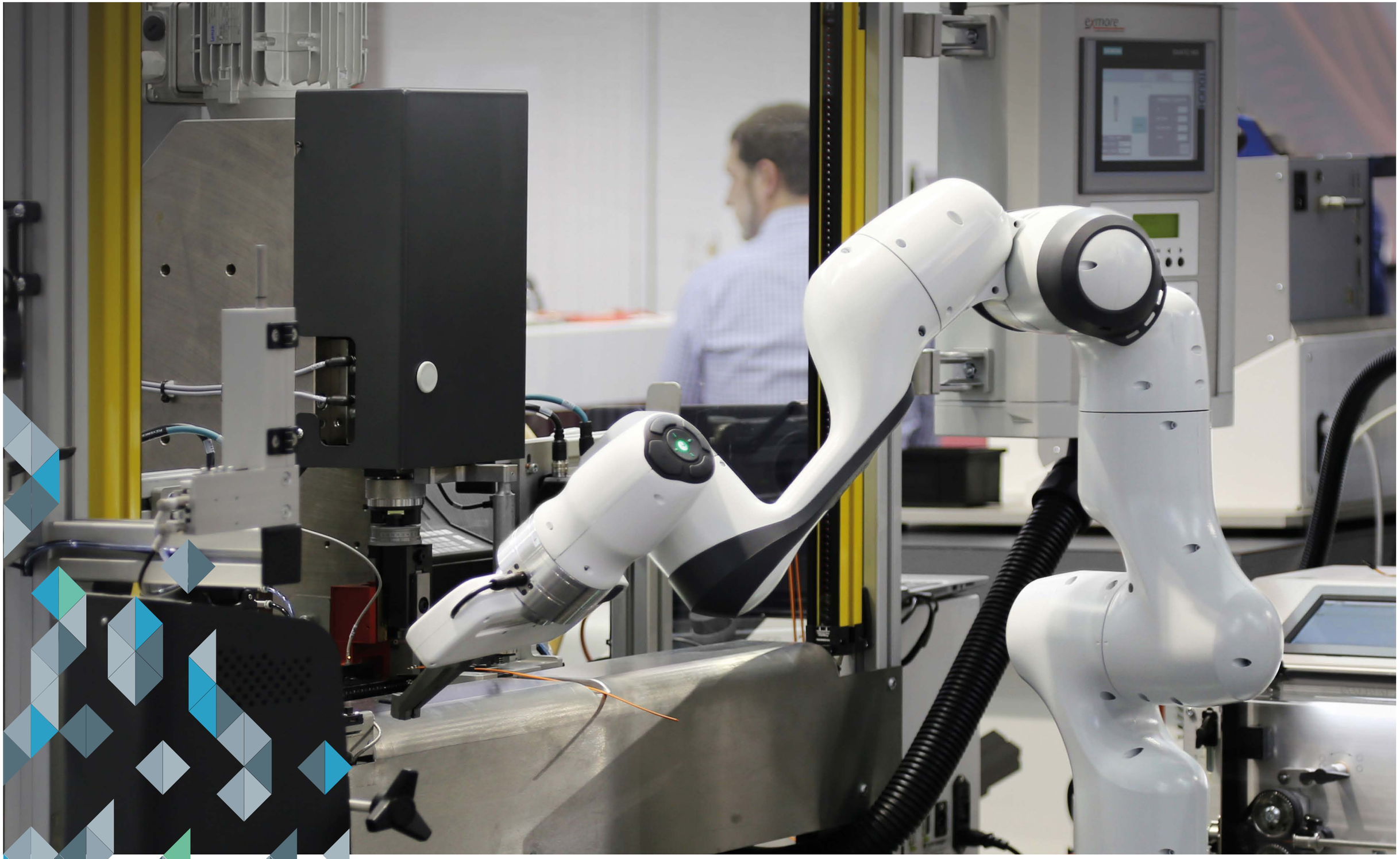

Panda @ exmore

You want to learn more?

Visit our website: www.franka.de

Join the Franka Academy

With the basic course you will learn in a few steps and hours how to use our sensitive, lightweight robot Panda, as a high-performance tool in a wide range of applications. The course consists of theory lessons and several practical modules. After training, you will be able to easily set up, program and teach Panda to carry out your desired tasks.

- Languages: English and German
- https://www.franka.de/training
- For more information: academy@franka.de

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