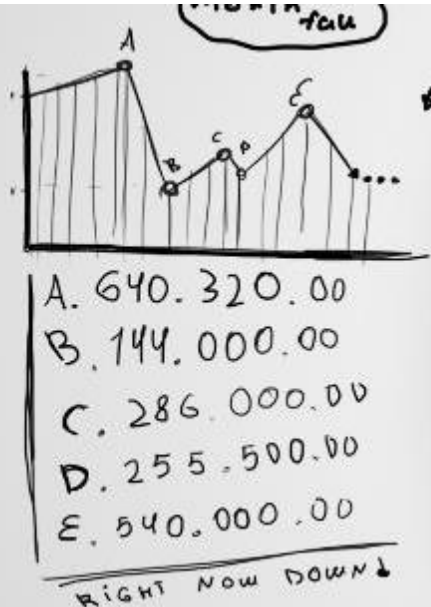


19. FFHS-Business Breakfast

25. Oktober 2018, Zürich



Roboter als Chance für KMU?

In Zusammenarbeit mit:



Tage der Technik

«Industrie 4.0 – Wann beginnt die Revolution?»

FFHS 

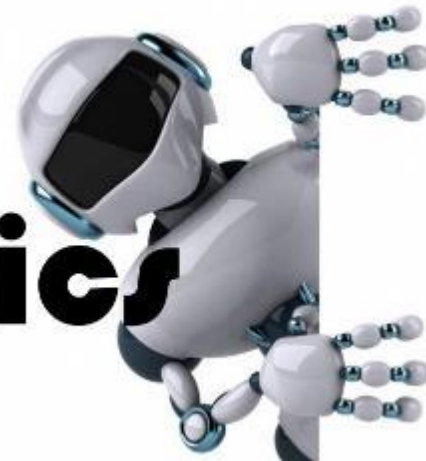
Fernfachhochschule Schweiz
Zürich | Basel | Bern | Brig

Mitglied der SUPSI

Simone Häberli, Dozentin MAS Industrie 4.0

David Gemmet, Studiengangsleitung MAS Industrie 4.0

Robotics



**„Pepper“ ... war gestern... heute ist
„Panda“...**



Industrie 4.0 – die Revolution betrifft sämtliche Bereiche....

Beschäftigung & Arbeitslosigkeit



Kompetenzen &
Qualifikationen

Soziale
Sicherheit

Arbeitsbedingungen & Gesundheit

NZZ am Sonntag, 09. September 2018

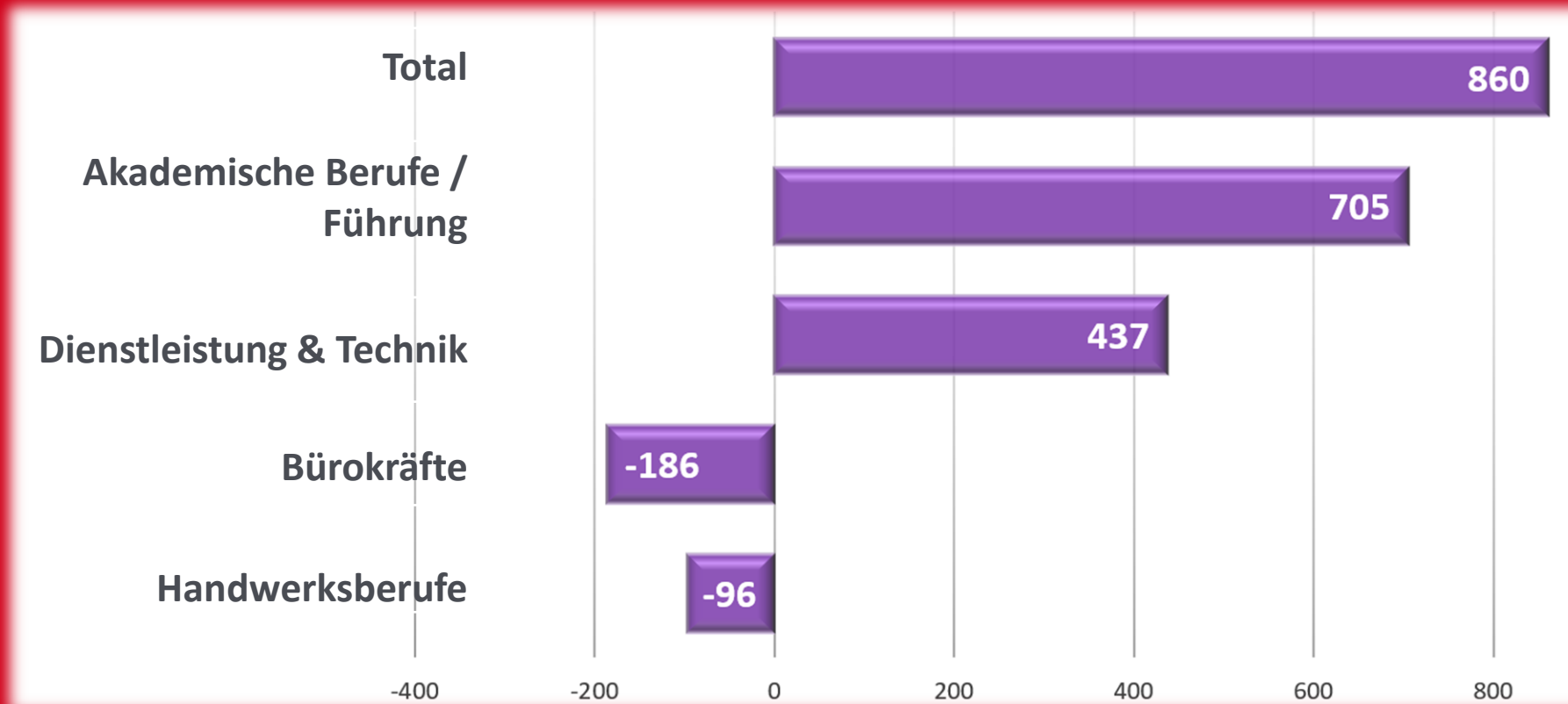


In Schweizer Maschinen steckt immer mehr Elektronik und Software: Ein Angestellter des Werkzeugmaschinenherstellers Tornos testet eine Maschine. (Moutier, 21. August 2017)

Schweizer Helden der Arbeit

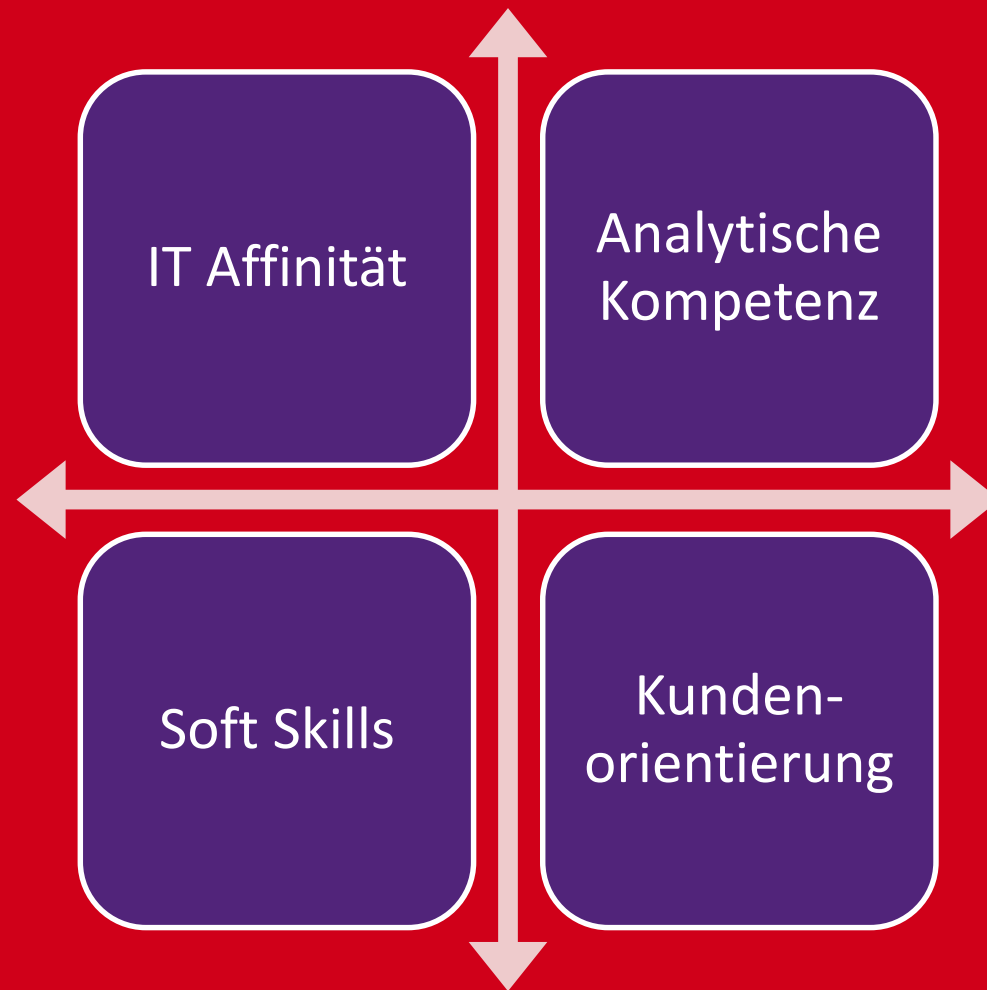
Die Industrie ist nach der Überwindung des Franken-Schocks in einer bemerkenswert guten Verfassung. Die Digitalisierung erlaubt Firmen sogar, Stellen in die Schweiz zurückzubringen. **Von Markus Städeli**

62% der Manager gehen davon aus, dass die fortschreitende Entwicklung mehr «neue» Jobs schaffen als «traditionelle» Tätigkeiten verdrängen wird. (Studie KMPG, 2018)

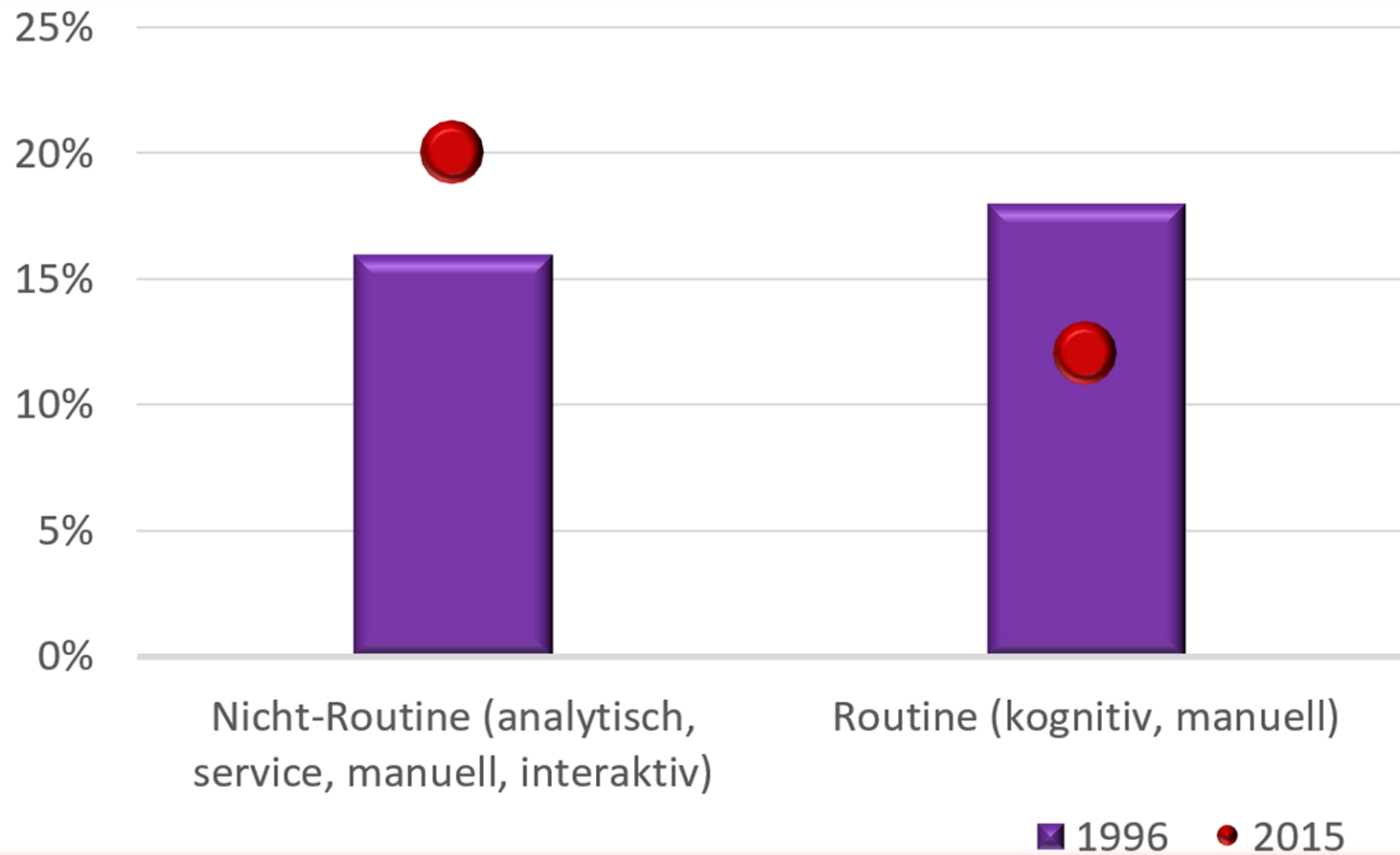


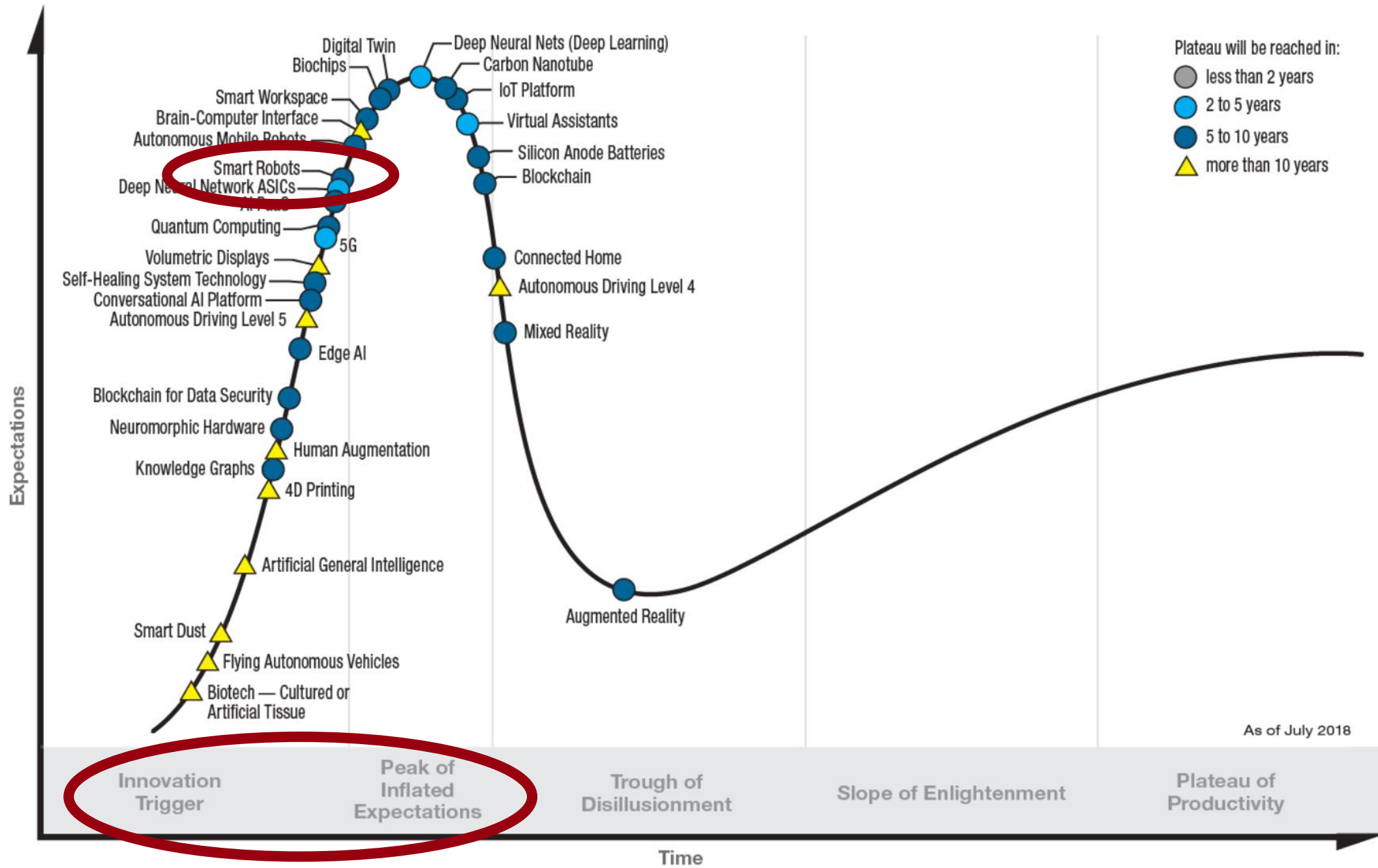
Quelle: Studie Bund zur Digitalisierung 2017, Entwicklung Berufsgruppen seit 1996

Welche Kompetenzen brauchen wir in diesem Umfeld?



Wie entwickeln sich unsere Tätigkeitsprofile?





Quelle: «Hype Cycle Emerging Technologies, 2018», Gartner

«Robotik Innovation und Trends – ein Überblick, sowie ein konkretes Beispiel im humanitären Bereich»



Dr. Jürg Germann, Head of Engineering



Robots & us



Robots everywhere



Why do robots change the game?

- Efficiency
- Accuracy
- Productivity
- Work in hazardous/dangerous situations
- Repetitive tasks
- Robustness
- Adaptive, intelligent and autonomous
- Easy-to-use
- Affordable

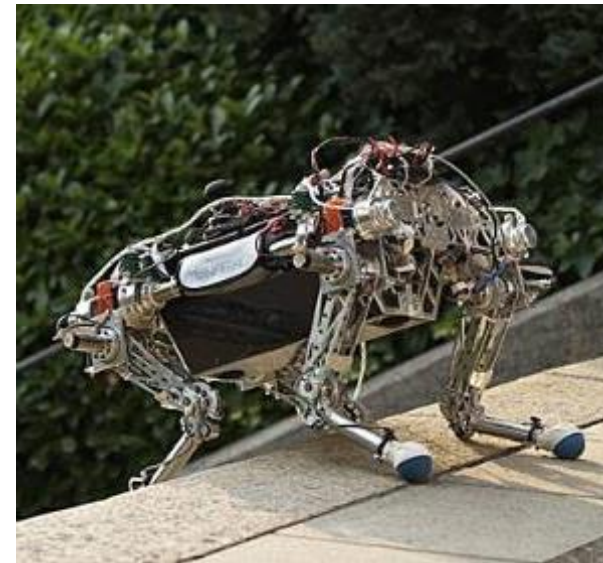
Robotics Evolution



KUKA, 70s



KUKA, 90s



StarLETH, 2010s

Manipulators

Industrial robots

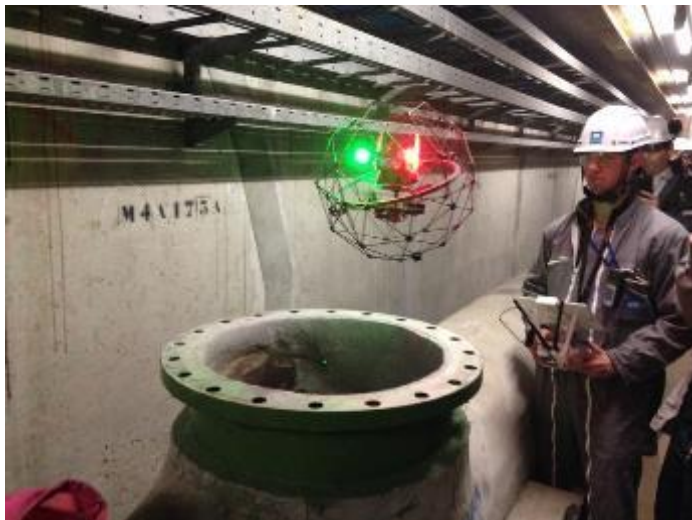
Intelligent robots

Collaborative,
personal and swarm
robots

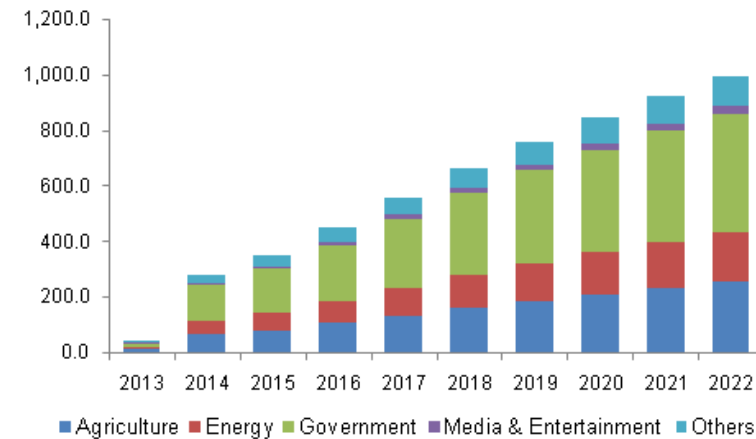
Flying Robots - Drones

■ Industrial Aerial Drone Applications

- Surveying and mapping
 - Land surveying, Urban planning
- Mining
 - Inventory, Site survey, Traffic management, water management, Collaboration
- Construction and inspection
- Agriculture

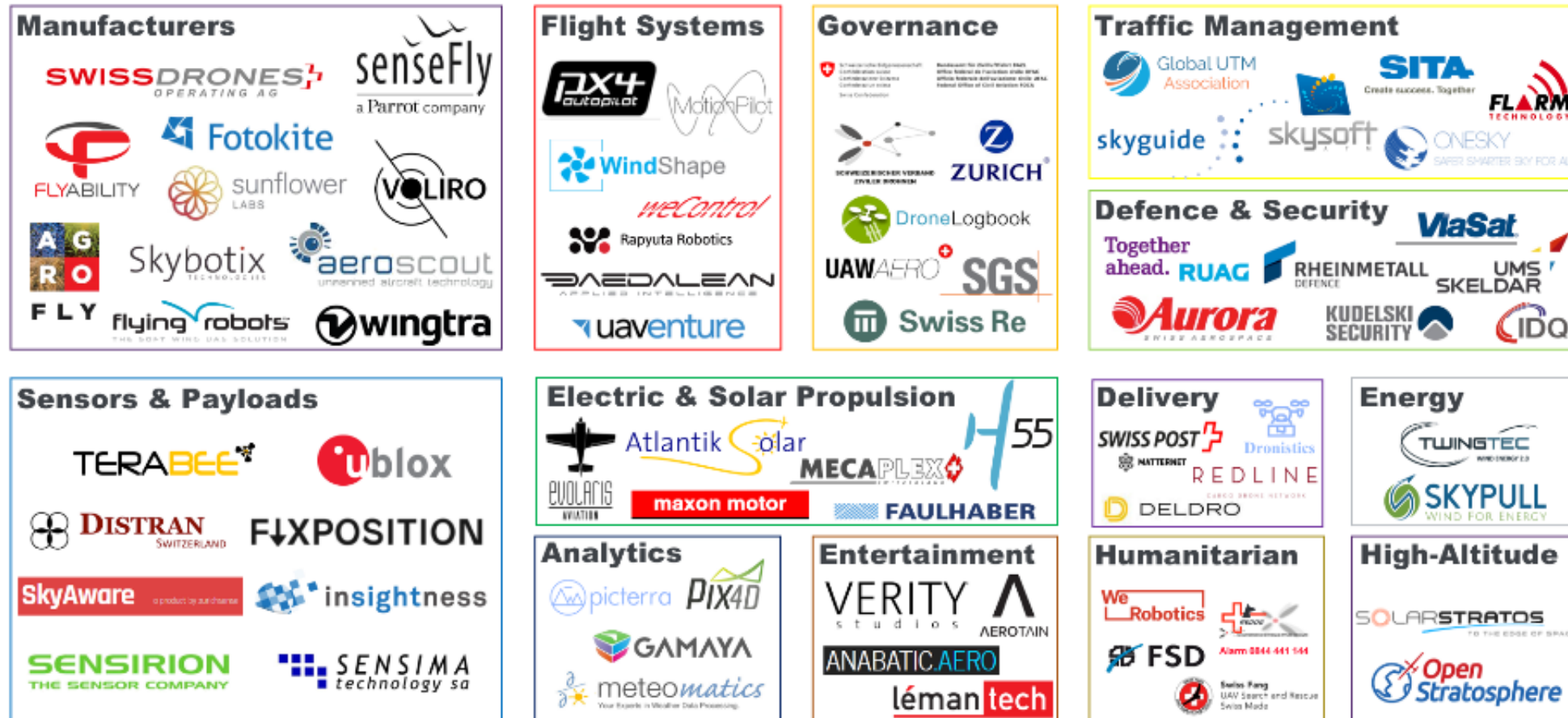


U.S. commercial drone market, by application, 2012 - 2022 (USD Million)



Switzerland Home of Drones

Swiss Drone Industry Map



Robots for the benefit of all



Robotics for social good

Public health-care robotics

- Mosquito control
- Medical cargo to remote areas

Humanitarian robotics

- Disaster response - Mapping
- Cargo drones for first aid

EcoRobotics

- Agriculture – Sustainable farming
- Nature conservation – protecting elephants, coral reefs

DevRobotics

- Business incubation programs
- Infrastructure issues – land grabbing



Use-Case: Mosquito-Control

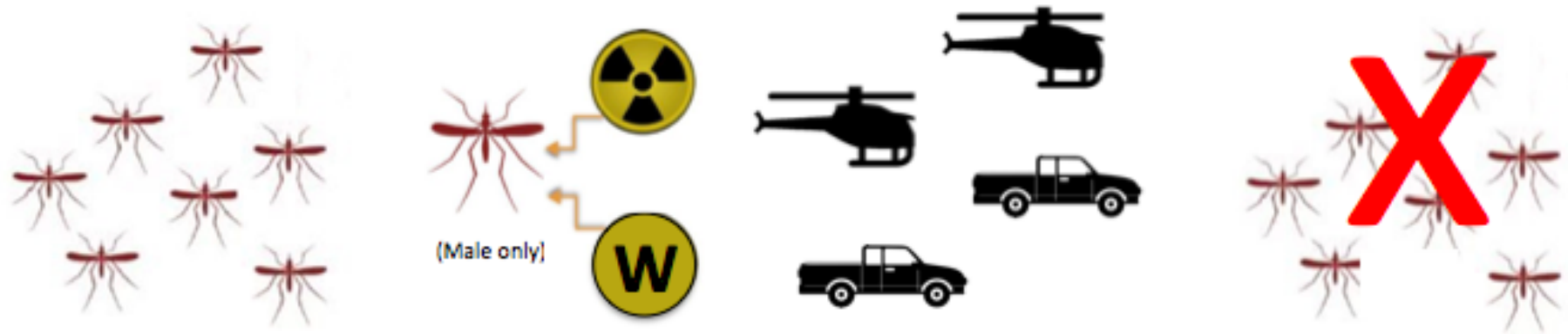


Traditional Mosquito-Control



Expensive and not sustainable...

Sterile Insect Technique (SIT)



Insect rearing → Treatment → Release → Population suppression

90% drop in mosquito population
- USAID Workshop, July 2016

Challenge: Mosquito-Release



Sterile Insect Technique with Drones



Opportunities

- Homogeneous release
- Autonomous operation
- Access hard to reach areas
- Low cost

Challenges

- Logistics
- Mechanics
- Planning & Control

WeRobotics + IAEA

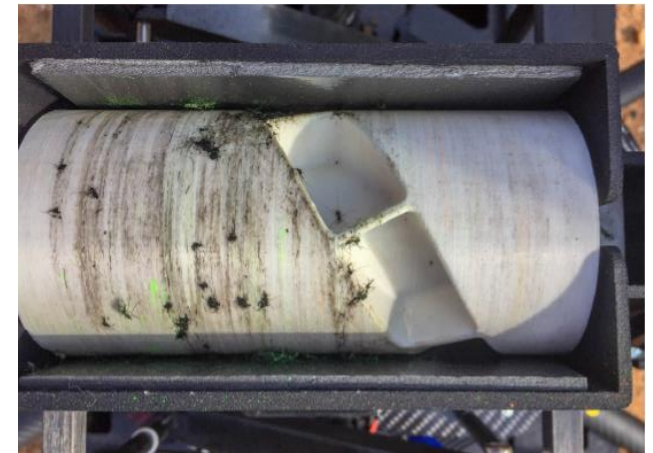
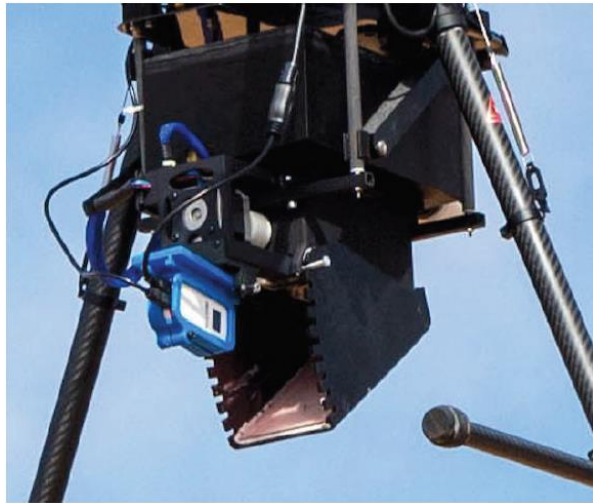
Developed first generation drone mosquito release system

- Chilled mosquito storage canister
- Packing procedure
- Automated dosing and release mechanism
- Drone interface and release planning software

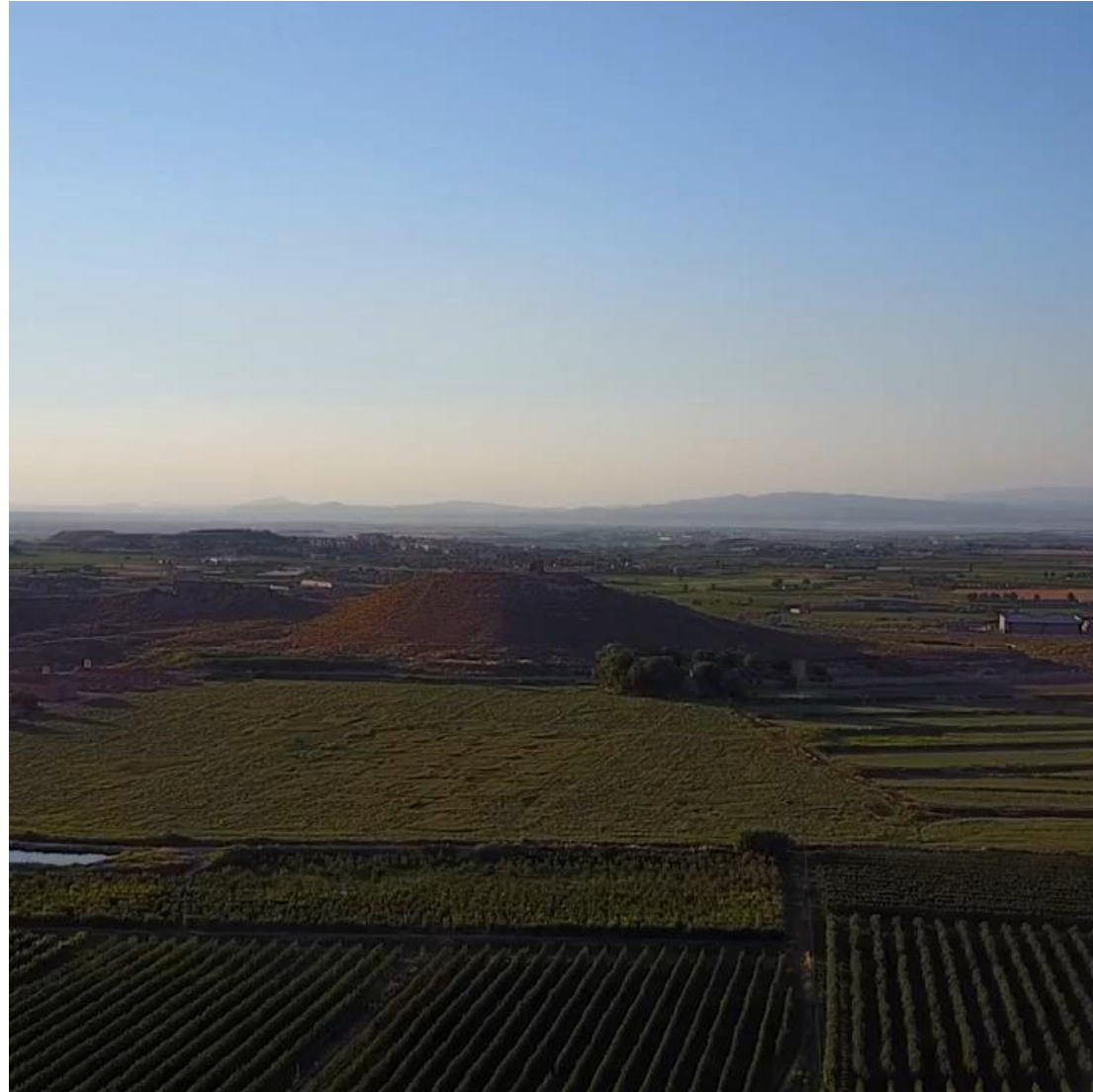


Field tests in Brazil

- 1 canister = 50,000 mosquitoes
- Temperature and humidity sensors
- PCM packs in insulation for temperature control during transportation to field site
- Separate mosquitoes into small doses (1-2k per dose)
- Electronically controlled, release on command

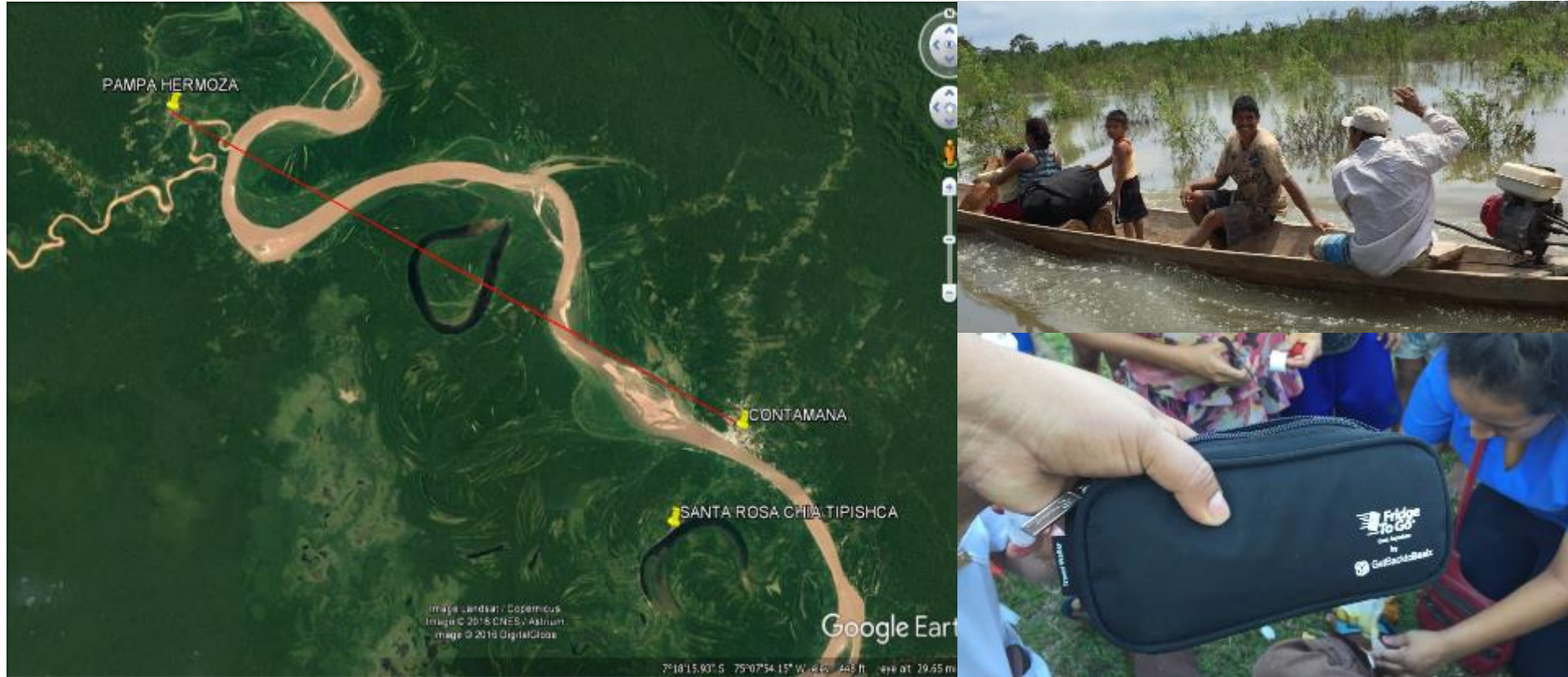


Sterile Insect Technique with Drones



Use-case: Cargo drones

Imagine living in the amazon ...



Distance of ~40 kilometers by air ...
takes 6 hours by boat ... or 35min by drone

Medical cargo drones: Opportunities <2kg



Blood



Vaccines



Anti-Venoms



Lab samples



Oxytocin

Medical cargo drones: Requirements



Automatic & Simple use

Reliable & Easy Maintenance



Conclusion

- Robots will benefit us all if they are
 - Affordable
 - Easy-to-use
 - Efficient (more accurate & faster)
 - Autonomous in the real world
 - Robust

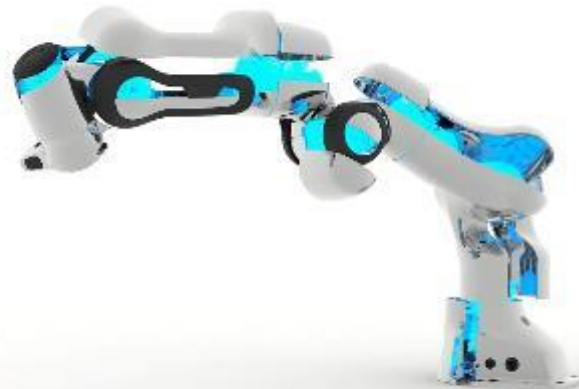
**We
Robotics**

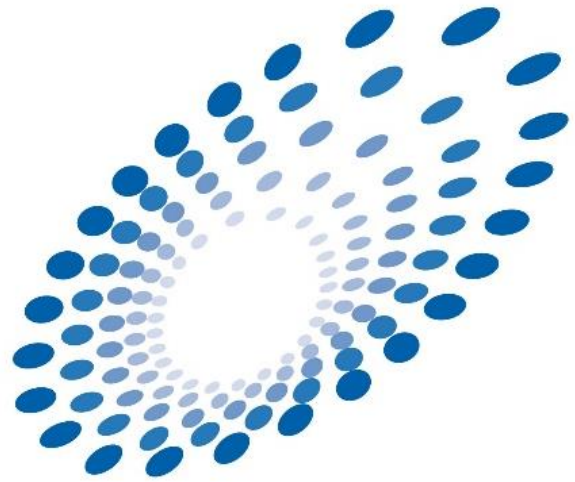


«Panda, der Gewinner des deutschen Zukunftspreis 2017 – Robotik & KMU's»

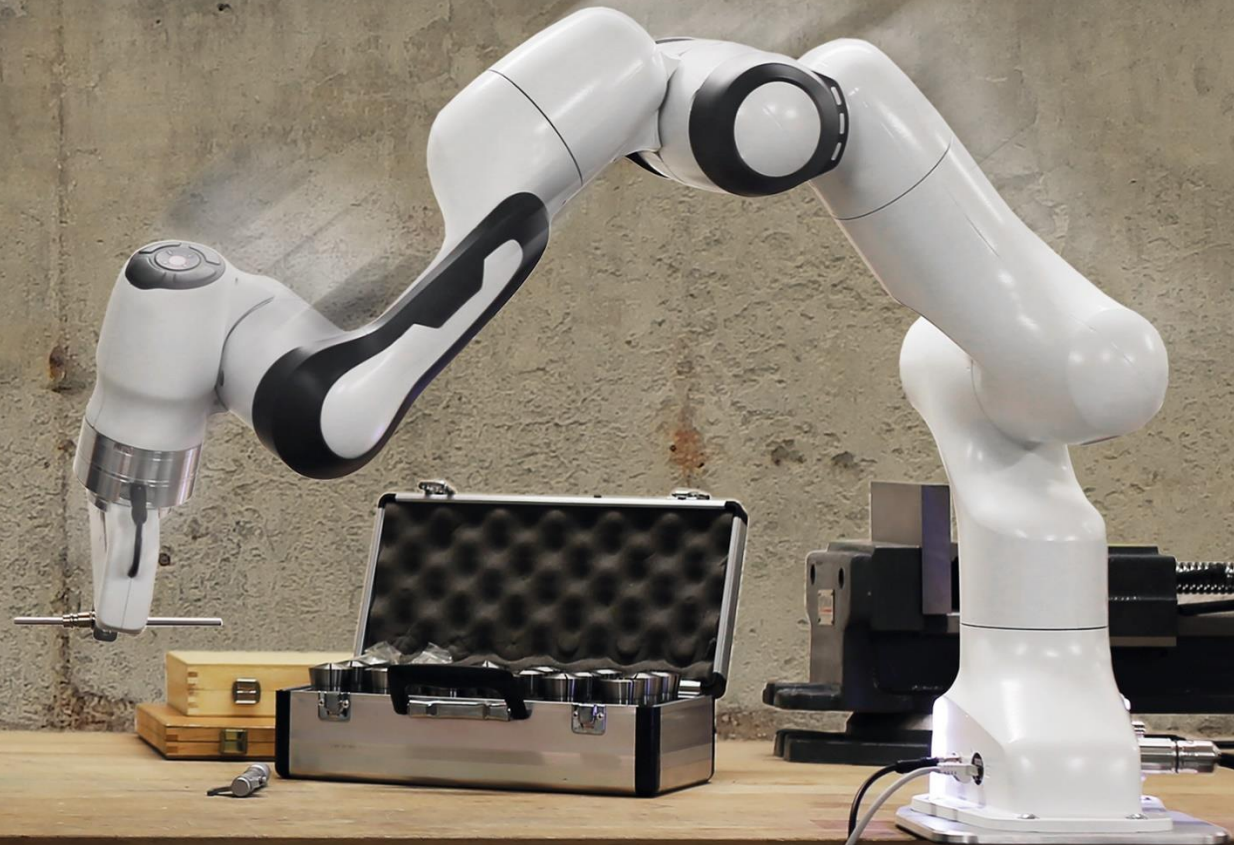


Michel Perret, Geschäftsführer / CEO





DEUTSCHER ZUKUNFTSPREIS
Preis des Bundespräsidenten
für Technik und Innovation



Fokus der Präsentation



Panda Roboter



Einsatzmöglichkeiten

Die Bestandteile von PANDA



Was an PANDA ist bahnbrechend?



menschenähnliche
Fähigkeiten



Smartphone
ähnliche
Programmierung



disruptive „low cost“
Hard-, Software &
Integration

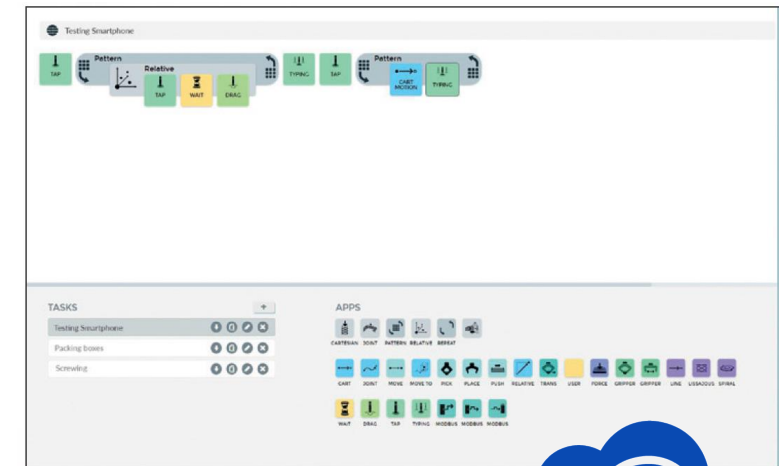
Installation & Task-Erstellung



auspacken



befestigen,
anschliessen



programmieren

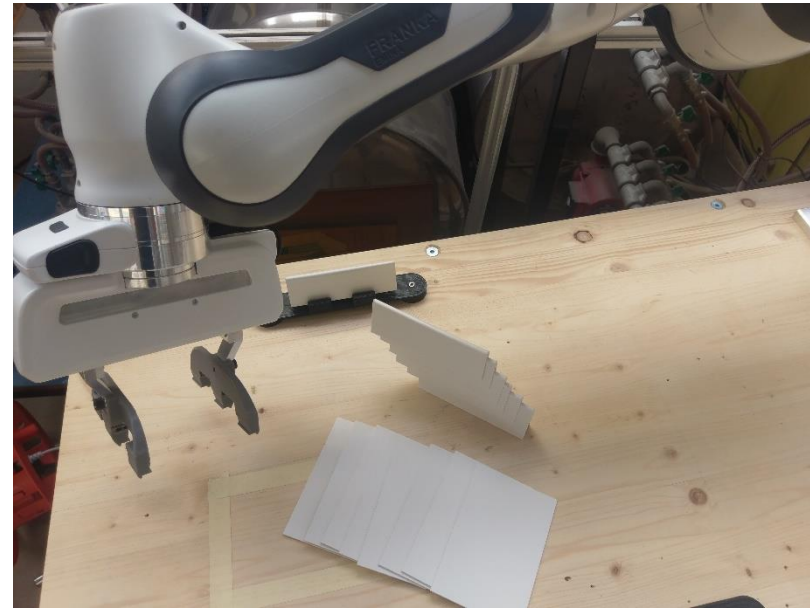
Einsatz Panda Roboter

bei CH-Kunden



testen

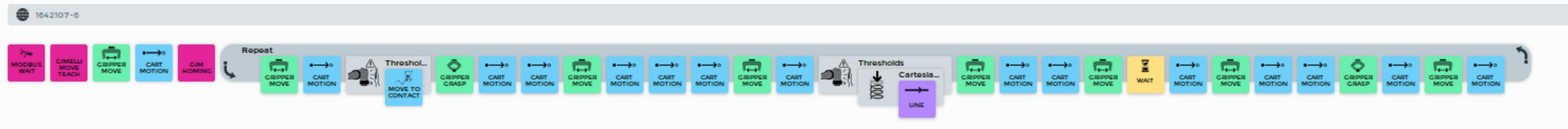
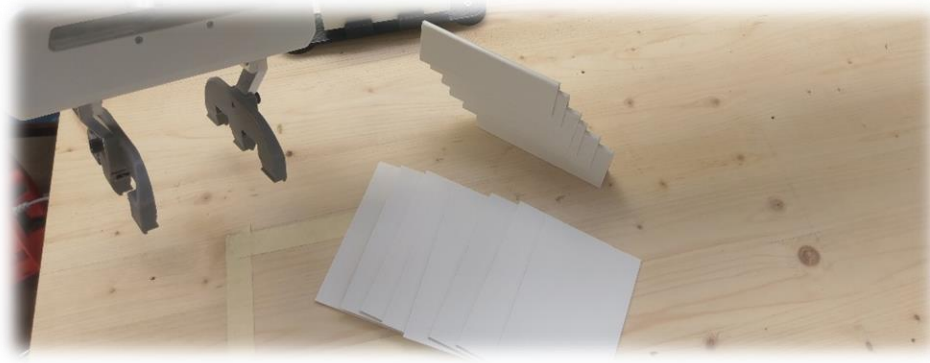
<https://youtu.be/4gGQGJ6HrhA>



produzieren

<https://youtu.be/hC9kz51oCwA>

Setup produzieren



- 11 Apps verwendet
 - davon 3 spezifische Apps
- Programmieraufwand:
 - Grobablauf $\sim 0.5h$
 - Abstapeln $\sim 0.5h$
 - Aufstapeln $\sim 0.5h$

Der Panda lebt von „Apps“

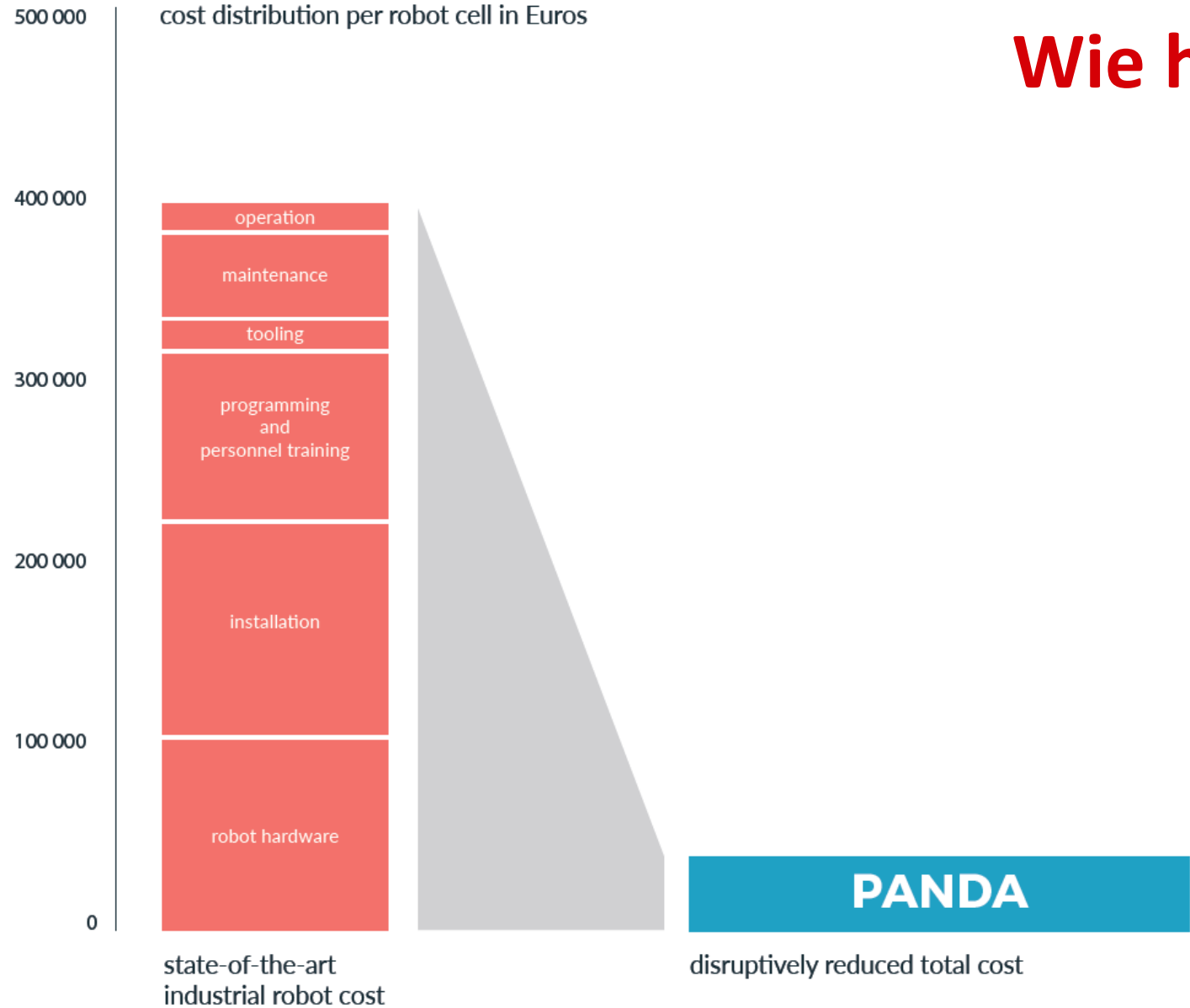


Der Panda lebt von „Apps“

The image shows a screenshot of the FRANKA EMIKA PANDA PCB Testing application interface. The main window displays a task titled "SHOW ME HOW TO RELEASE THE CHIP!". The interface is divided into several sections:

- Header:** "PANDA PCB Testing" and "FRANKA EMIKA".
- Task List:** A list of tasks with "RELEASE PCB" selected. Other tasks include "GRASP PCB".
- MOTION:** A section with a "MOTION" arrow pointing to the right.
- Diagram:** A diagram showing a robotic hand positioned above a PCB. The hand is labeled "Position above" and "Open fingers". A callout box says "Place position" and "Press Resize to re-teach this step.".
- Guiding Mode:** A section with four icons representing different guiding modes.
- Pilot Mode:** A section with two icons labeled "DESK" and "HAND".
- Run Button:** A large button labeled "RUN THE TASK" with a play icon.

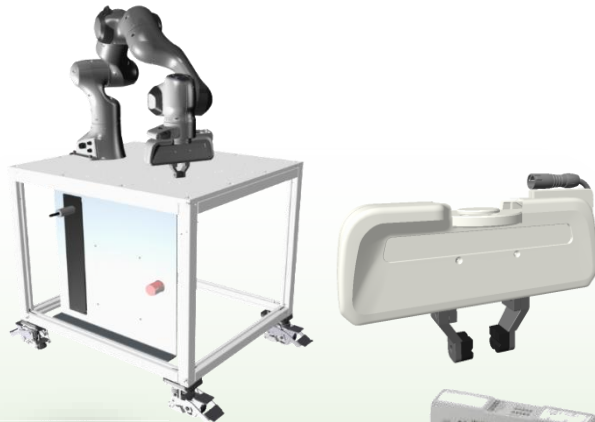
Wie hoch ist die Investition?



Wie hoch ist die Investition?

durchschnittliche Anwendung mit Flexibilität

50'000 EUR



Hardware Zubehör

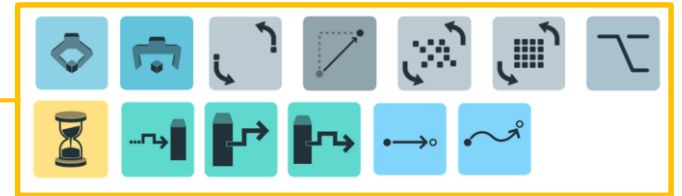
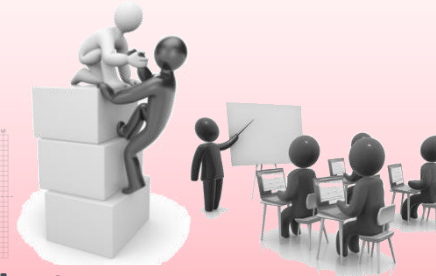
Software Roboter (8-13 Standard Apps)

Hardware (Roboter, Controller, Kabel, Taster)

0 EUR

€

Dienstleistung



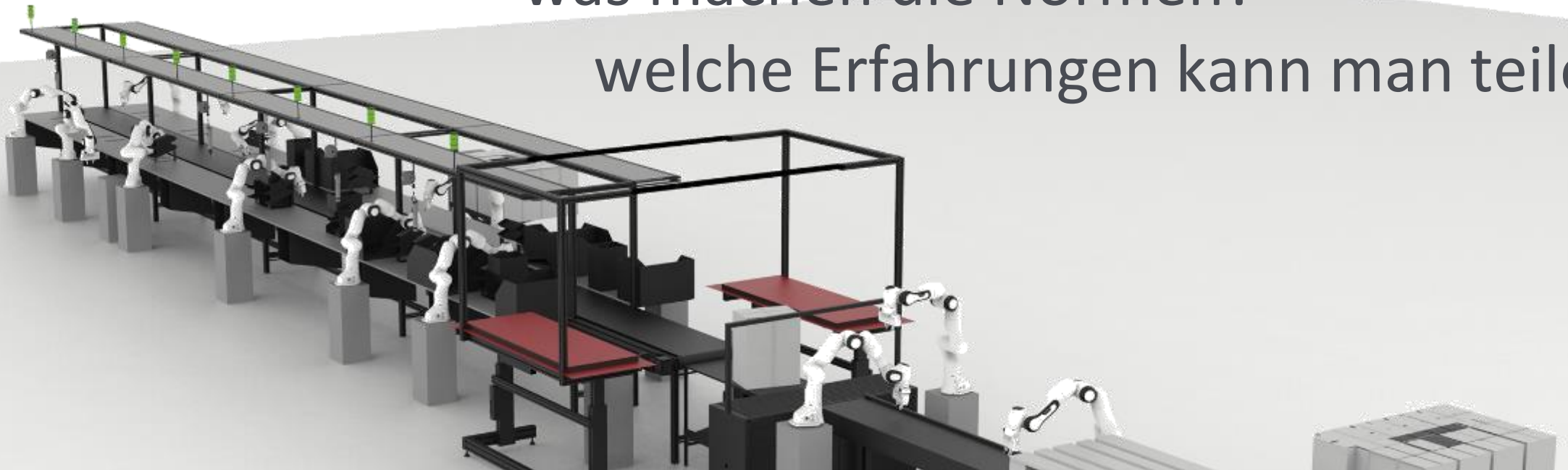
Chancen & Risiken

wirklich so?

wo bleibt der Mensch?

was machen die Normen?

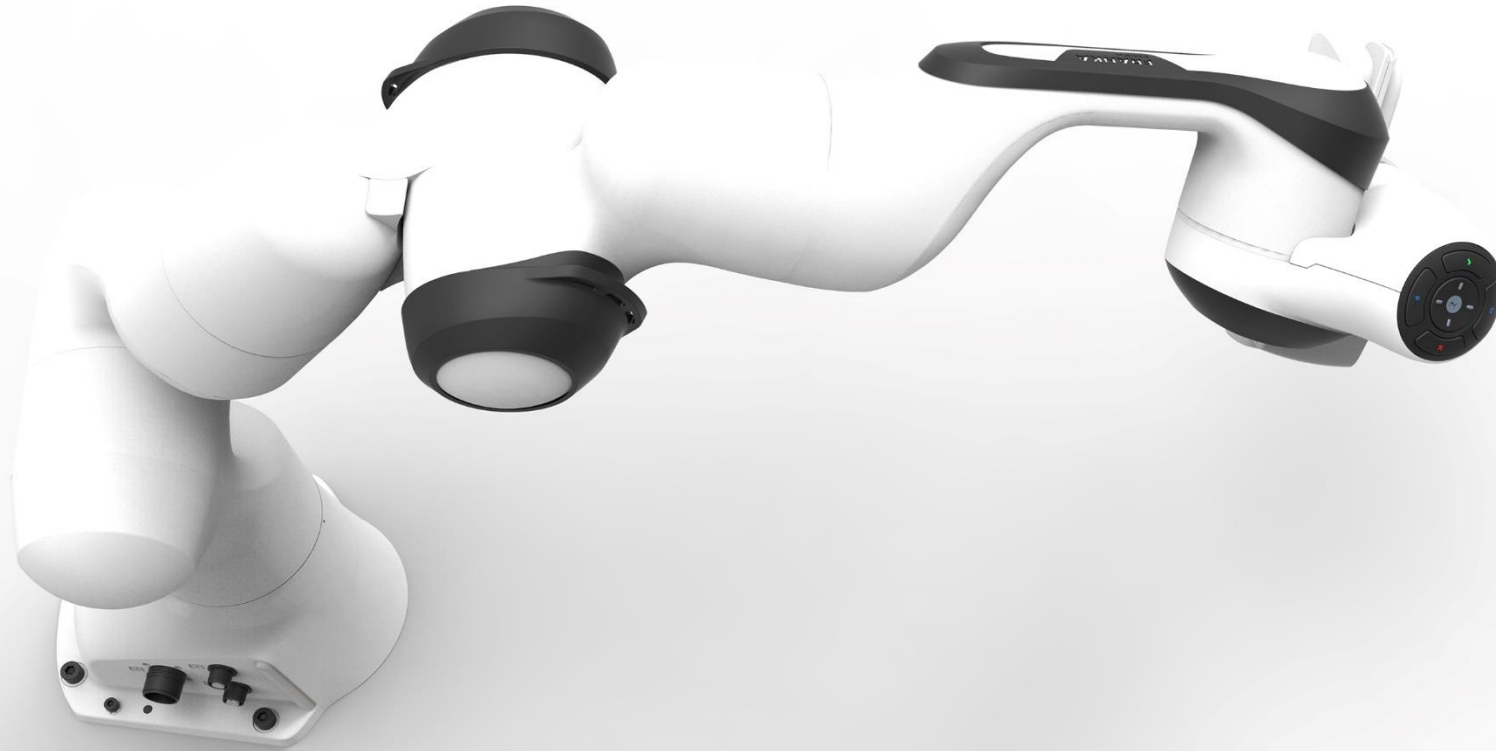
welche Erfahrungen kann man teilen?



Die Einsteigerfragen

- Welches sind die realistischen Kosten eines bestimmten Roboters?
- Wie realistisch ist die Machbarkeit?
- Ist der Roboter zukunftssicher?
- Welches sind die wirklichen Bedürfnisse in der Produktion?
- Welchen Mehrwert bringt ein Roboter?
- Können wir die Technologie in unsere Prozesse integrieren?
- Beinhaltet unsere Prozesslandschaft bereits automatisierte Systeme?

Wohin geht es?



FRANKA EMIKA

gimelli
ENGINEERING



Diskussion

Nächstes FFHS-Business Breakfast

Psychologie der Geschäftsmodell-Innovation

22. November 2018, Zürich

