Innovative new areas of use of AI and ML in the Manufacturing Industry

Presented by: Dr. Stefan Elmer

For: ETSI Summit on Artificial Intelligence

04.04.2019

Structure

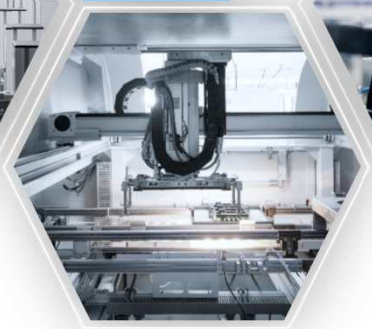
- Festo at a glance
- What is this the idea behind Industrie 4.0
- Artificial Intelligence in a nutshell
- Applying AI as an example
- Our Vision at Festo

Festo at a glance

› 30.000
catalogue
products

Customer
Solutions

› 10.000
individualised
solutions



Electric
Automation

Pneumatic
Automation

Customers
Automation
› 300,000

Employees
worldwide:
20,100

Turnover:
3.1 Billion Euro

Customers
Didactic
› 56,000

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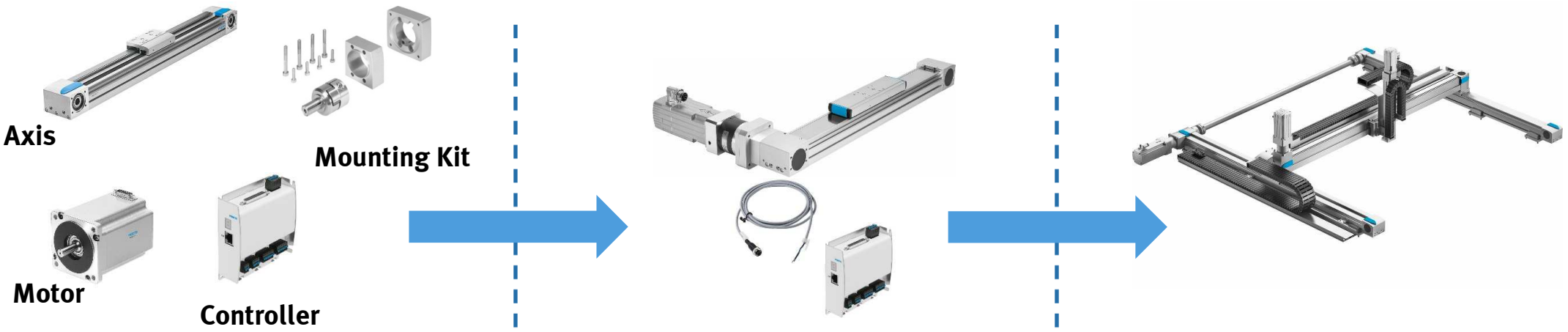
It‘s a complex world we live in…



Basic Components
(thousands)

Drive Trains
(millions)

Complex Cartesian Systems
(quadrillions)

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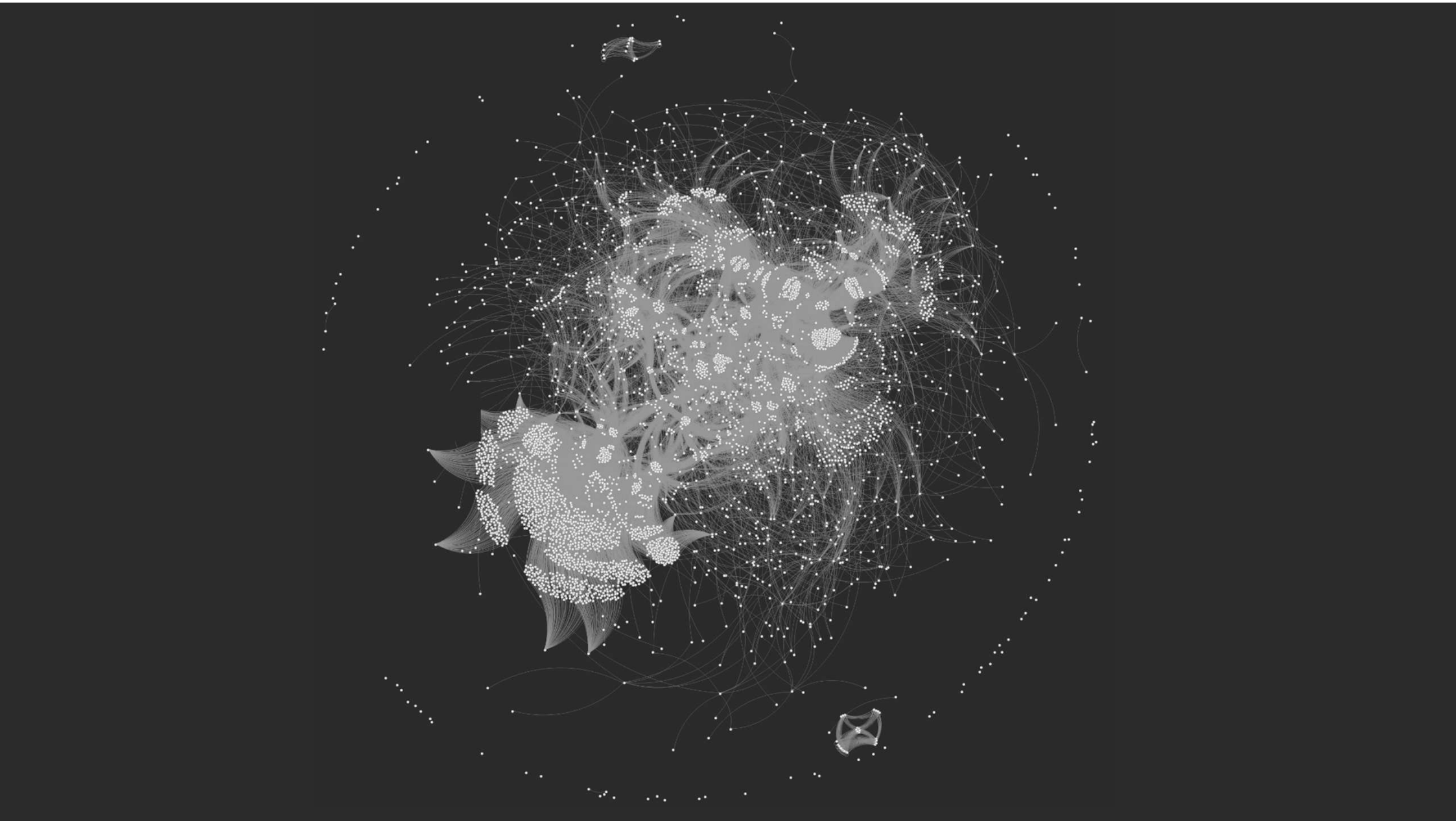
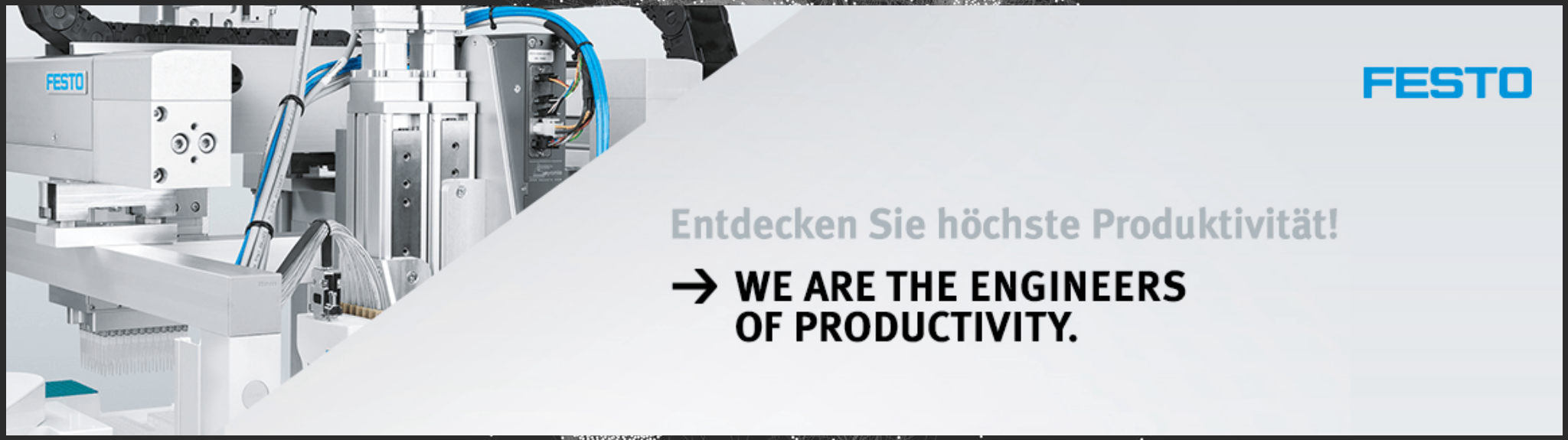



FESTO
FESTO
Entdecken Sie höchste Produktivität!
→ WE ARE THE ENGINEERS
OF PRODUCTIVITY.

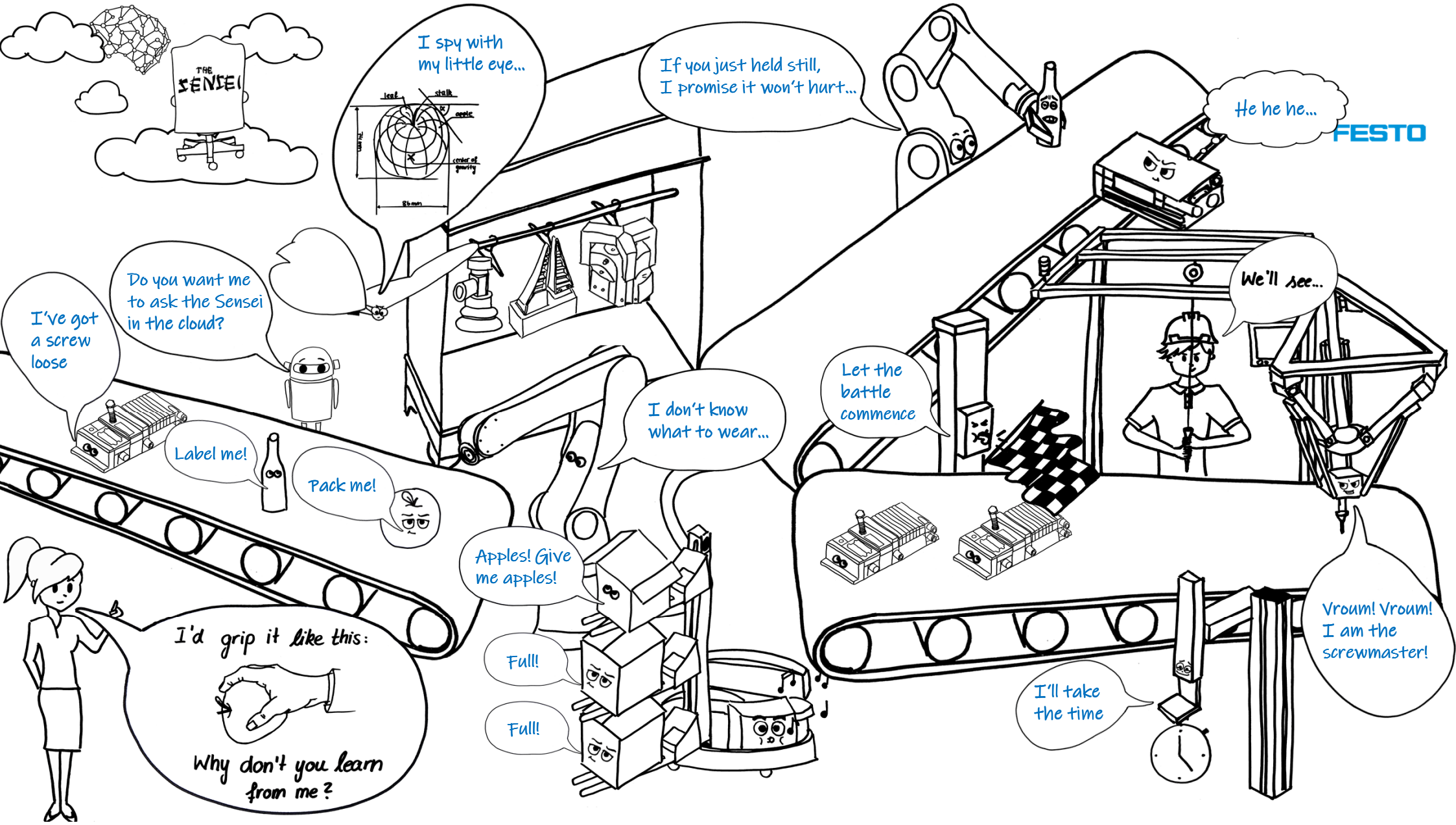
Longterm evolution of our Digital Solutions
to an I4.0 Full Service Portfolio for OEM & End User

FESTO

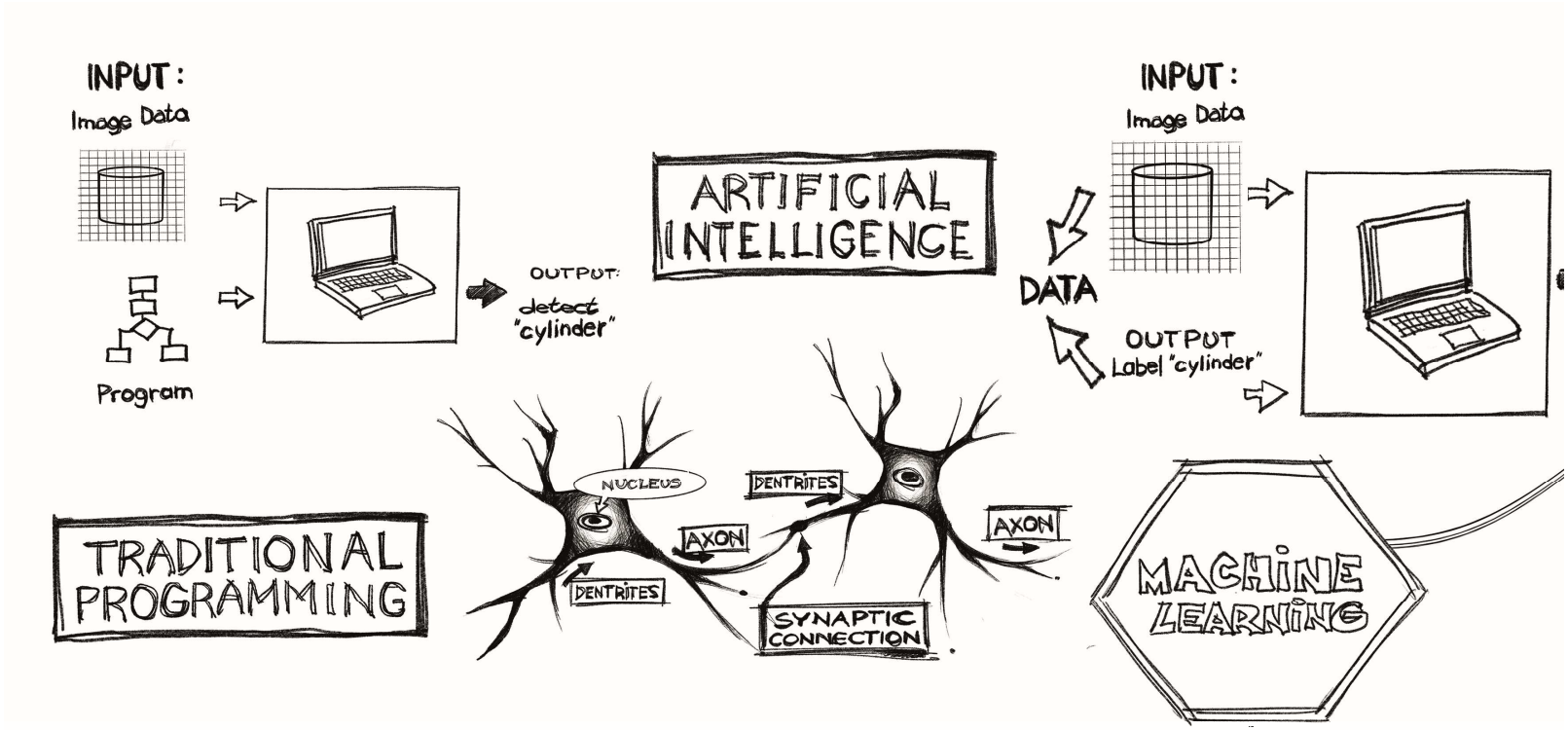
OEM
"We make machines ready for industry 4.0"

END USER
"We maximize the OEE through digital industry solutions"

Engineering | Commissioning | Operation | Maintenance


THE SENSEI
I spy with my little eye...
If you just held still, I promise it won't hurt...
He he he...
FESTO
I've got a screw loose
Do you want me to ask the Sensei in the cloud?
We'll see...
Label me!
Pack me!
I don't know what to wear...
Let the battle commence
Apples! Give me apples!
Full!
Full!
I'd grip it like this:
Why don't you learn from me?
I'll take the time
Vroum! Vroum! I am the screwmaster!

Speaking of Artificial Intelligence…



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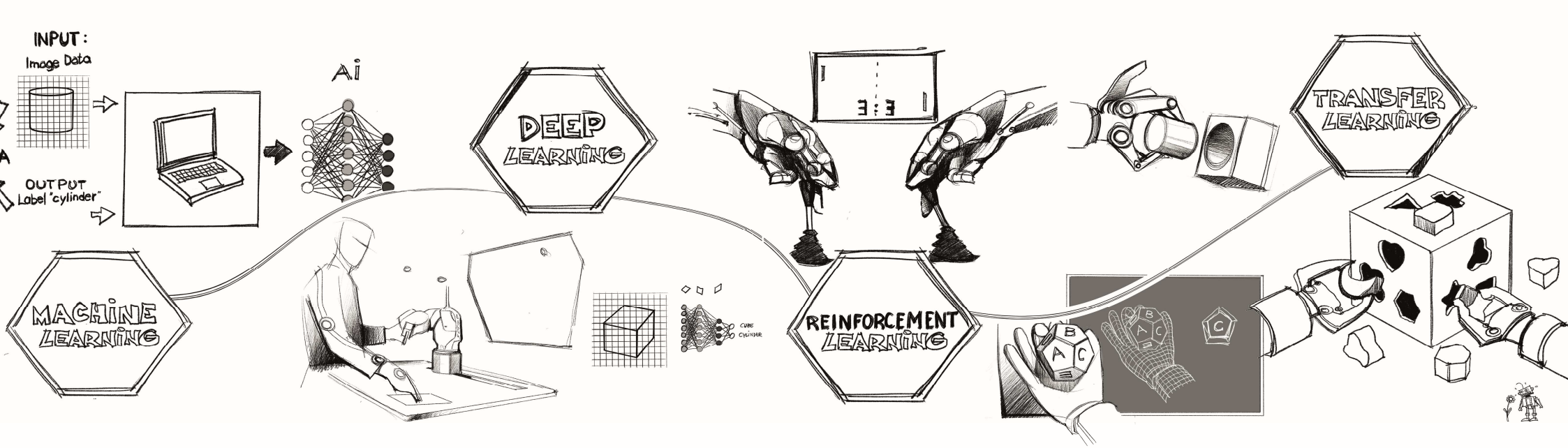
The Evolution of Machine Learning



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Applying AI…

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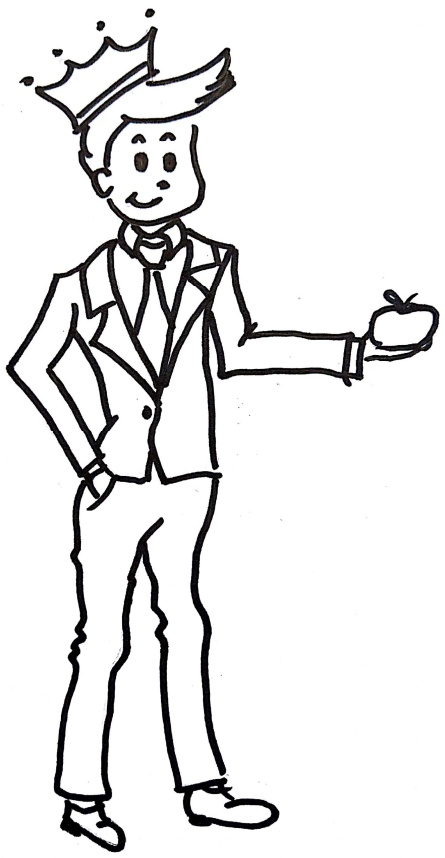
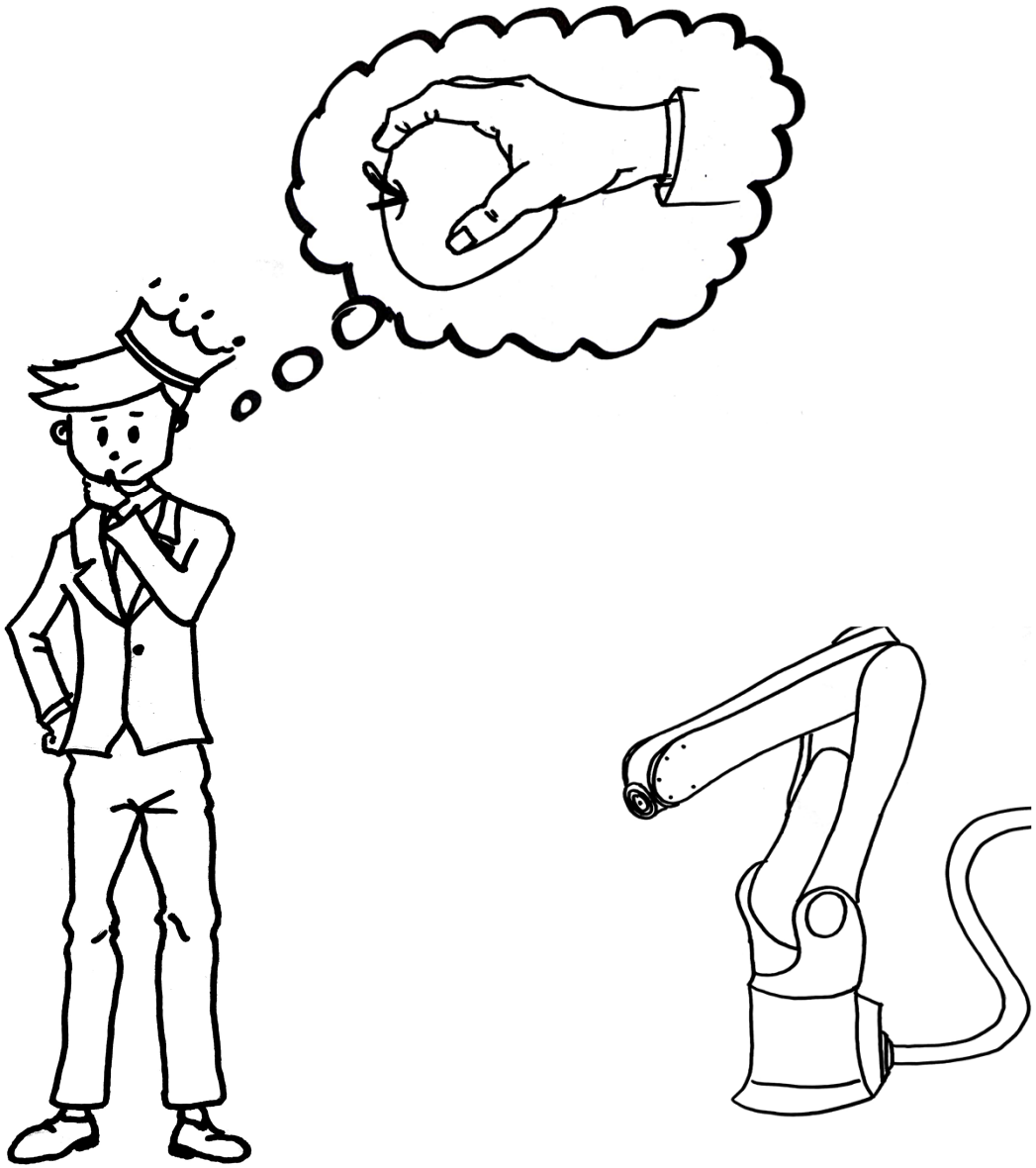
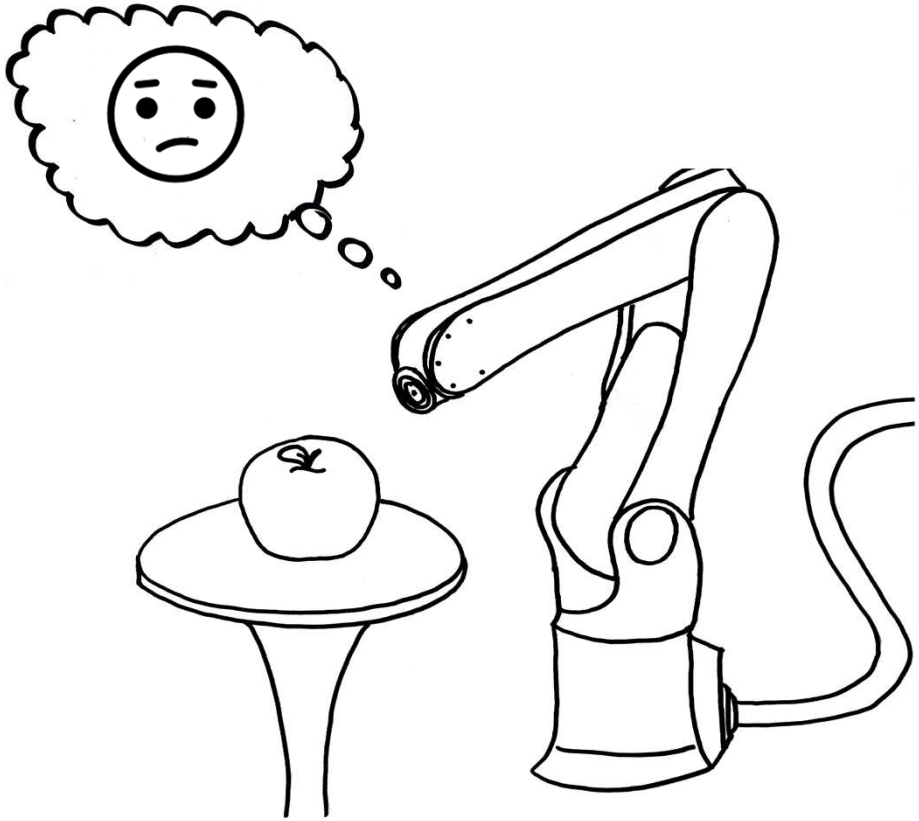


This is Tom
Tom has an apple…



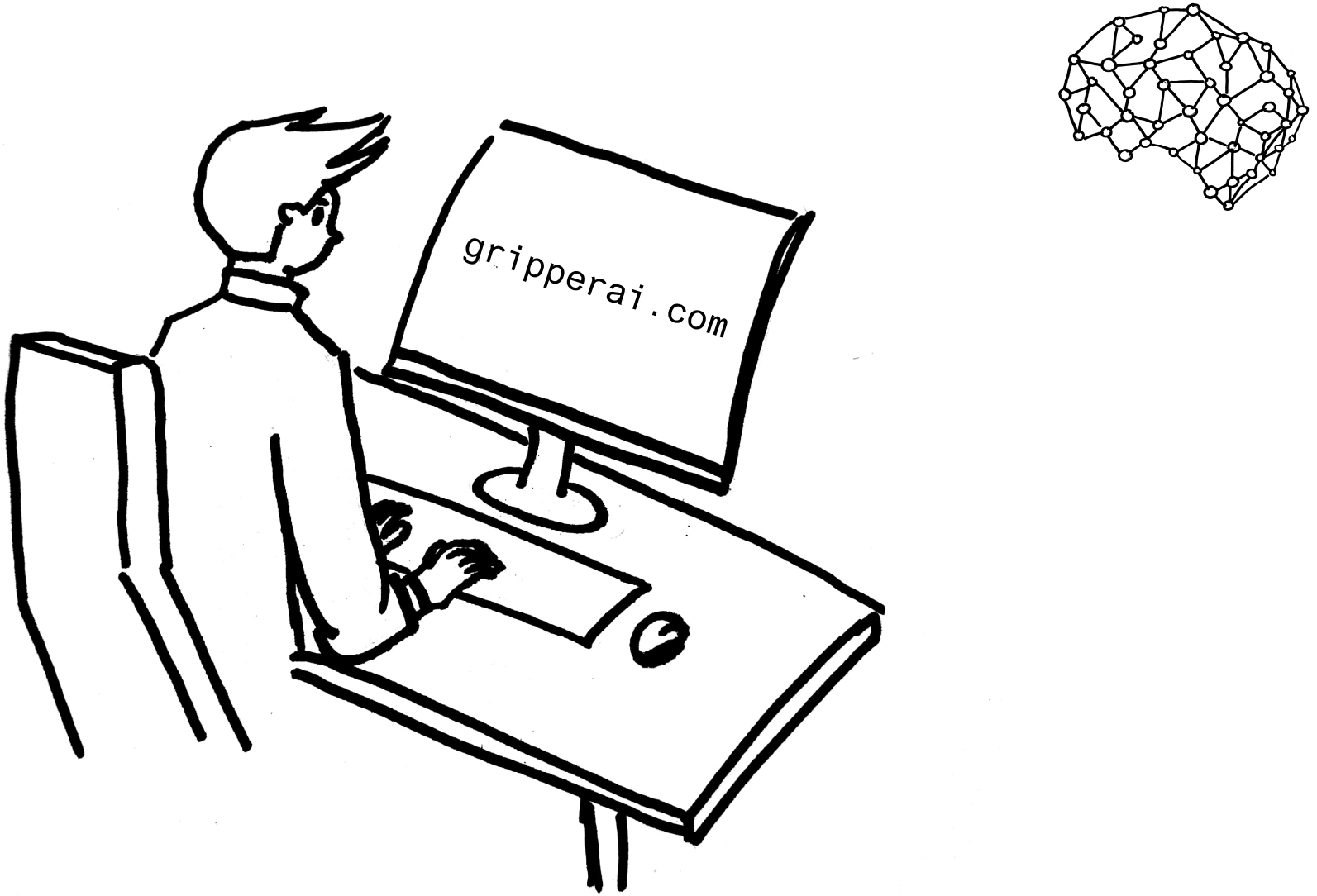
This is Tom
Tom has an apple
Tom wants his robot to grasp the apple
His robot is named Frank

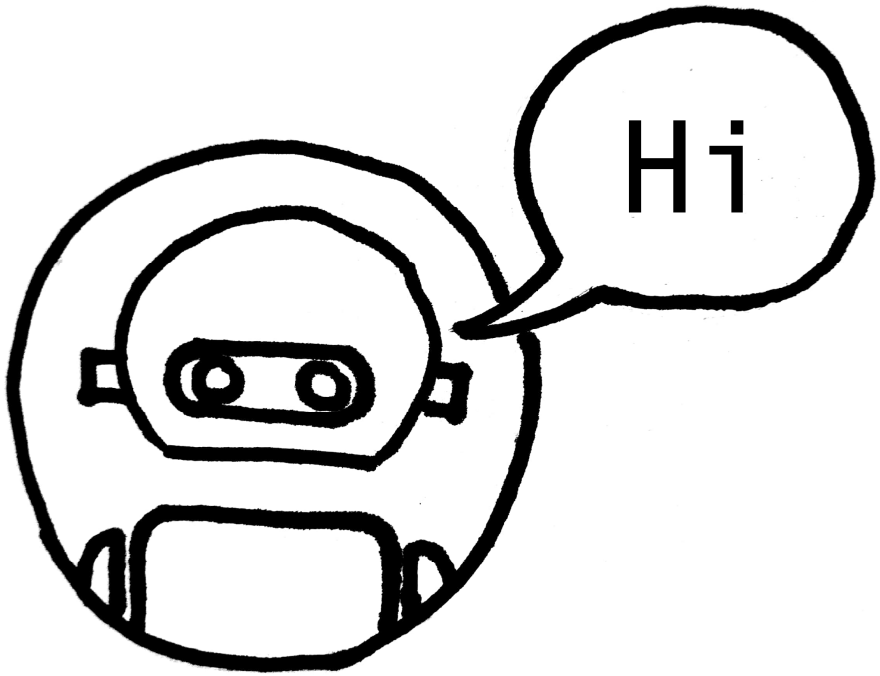
This is Frank…

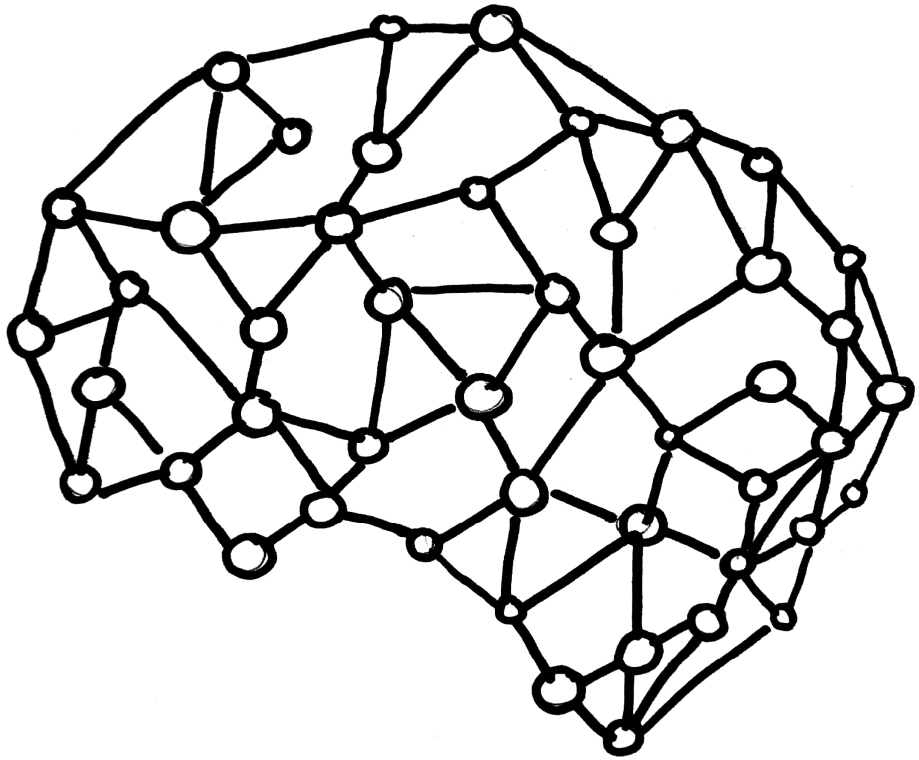


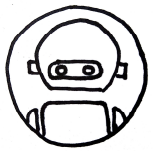
Frank doesn‘t know what an apple is
Frank can not grasp an apple
Frank is confused…

Tom heard about Festo‘s new GripperAI


gripperai.com

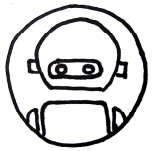

Hi





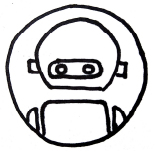
How can I help you?

I want my robot to grasp an apple



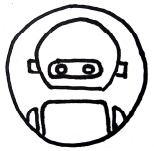
Great… I know what an apple is.
How do you want to grasp your apple?

It should be placed upside down after handling it and has a sensible surface.

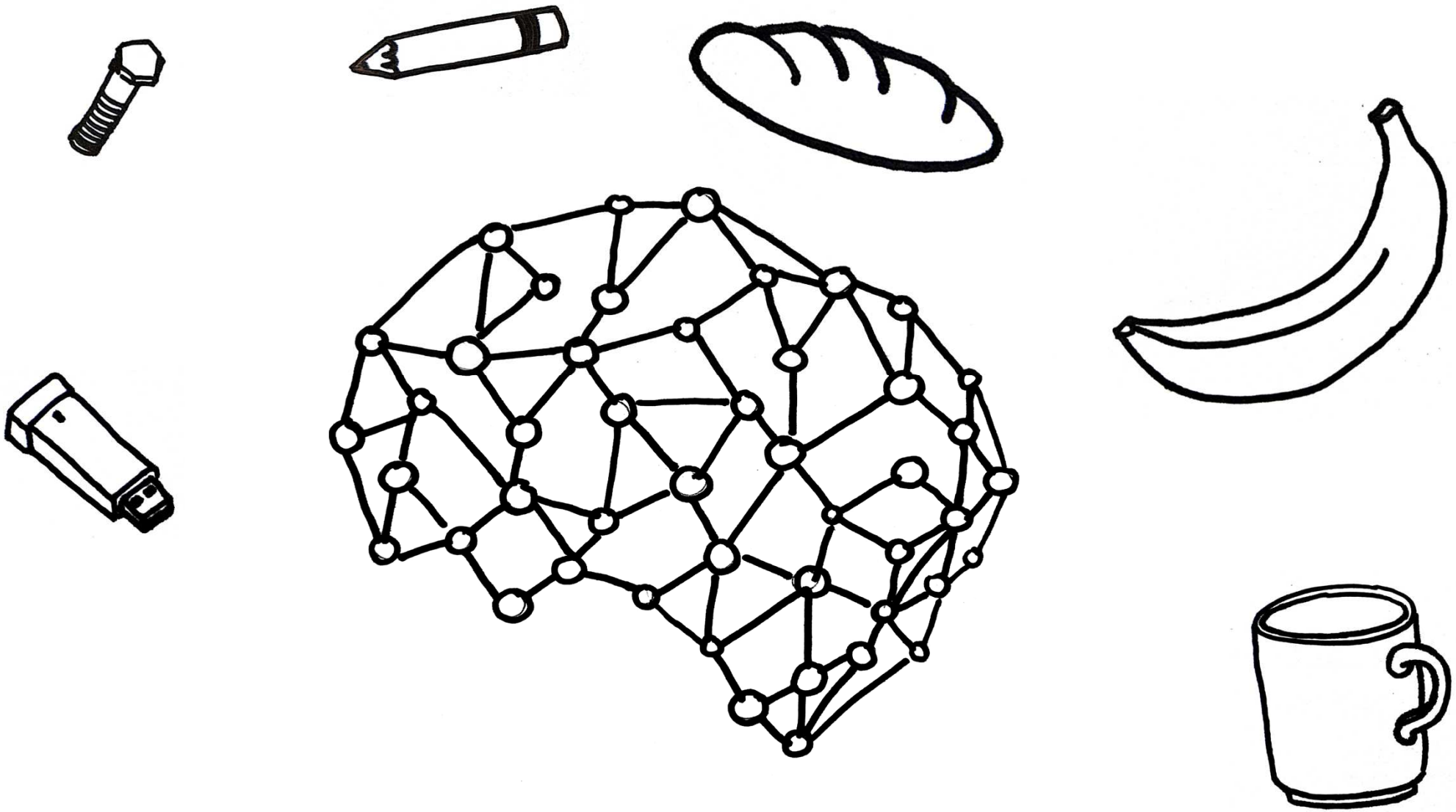


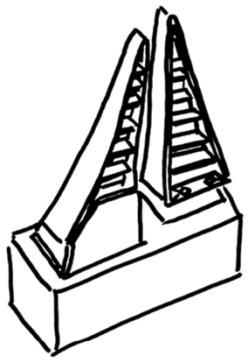
Okay, understood.
What kind of robot do you want to use?

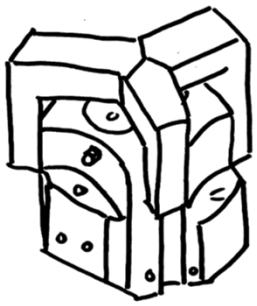
I have Frank.

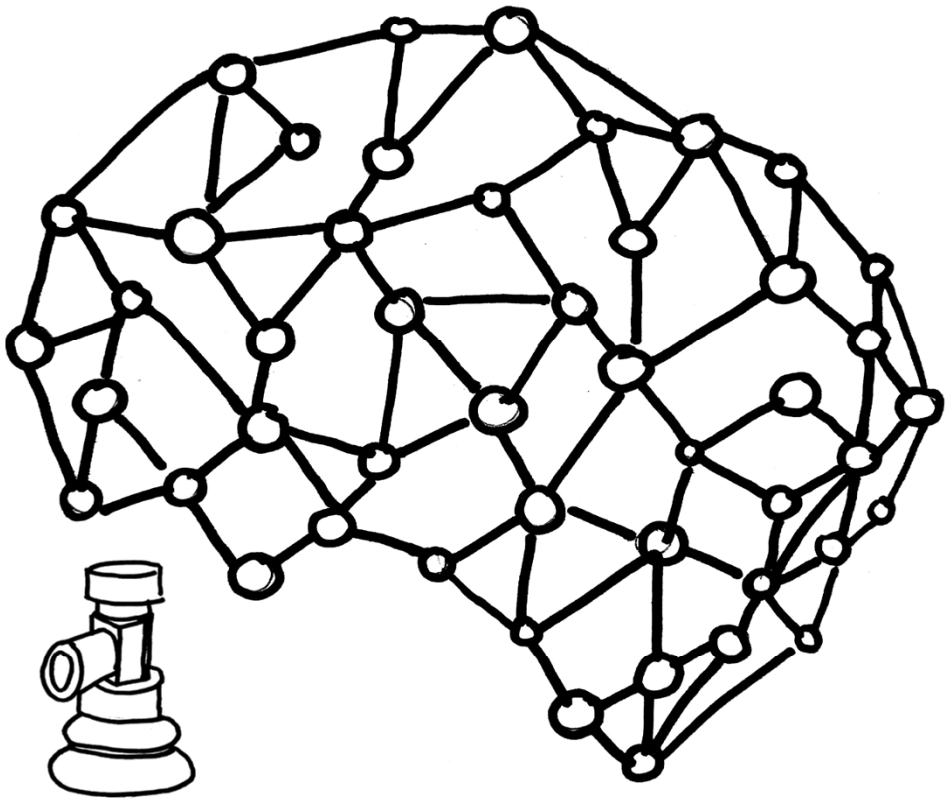


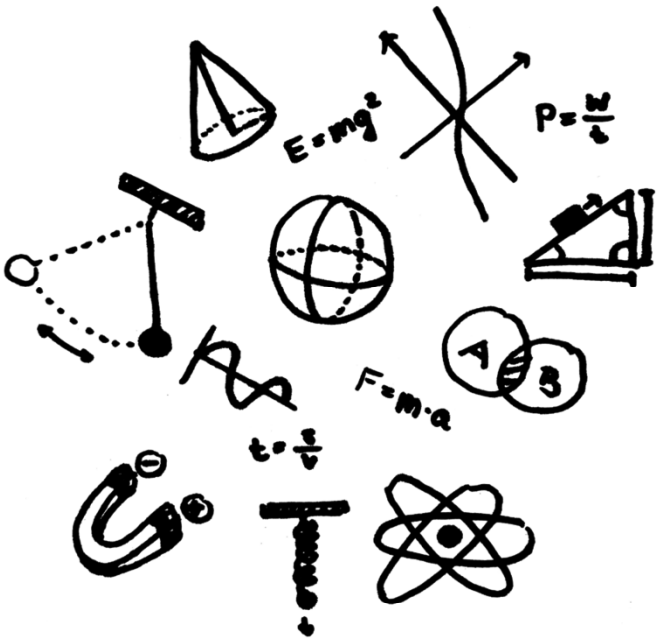
I know Frank! He‘s a great guy! I don‘t want him to be confused.
Let me check that.

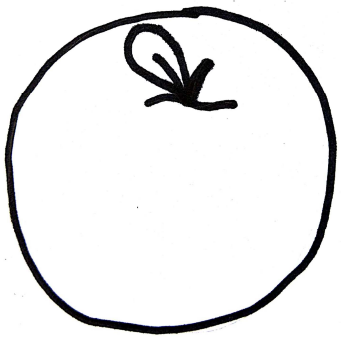


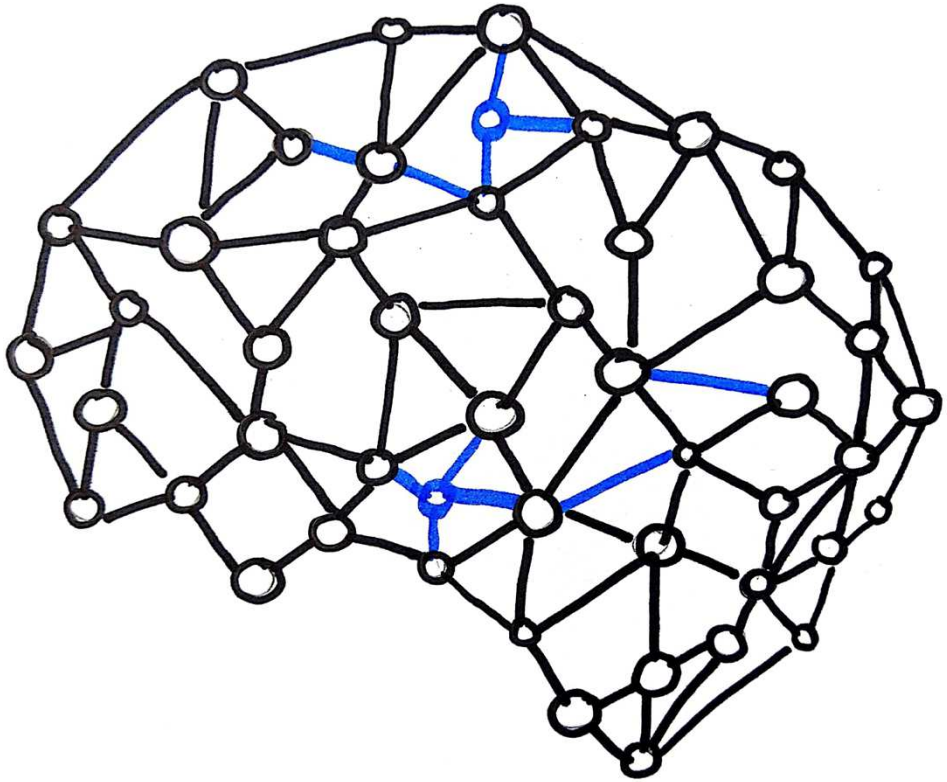


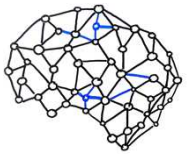





E=mg²
P=W/t
A
B
F=m·a
t=s/v





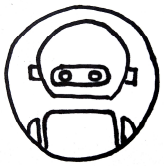


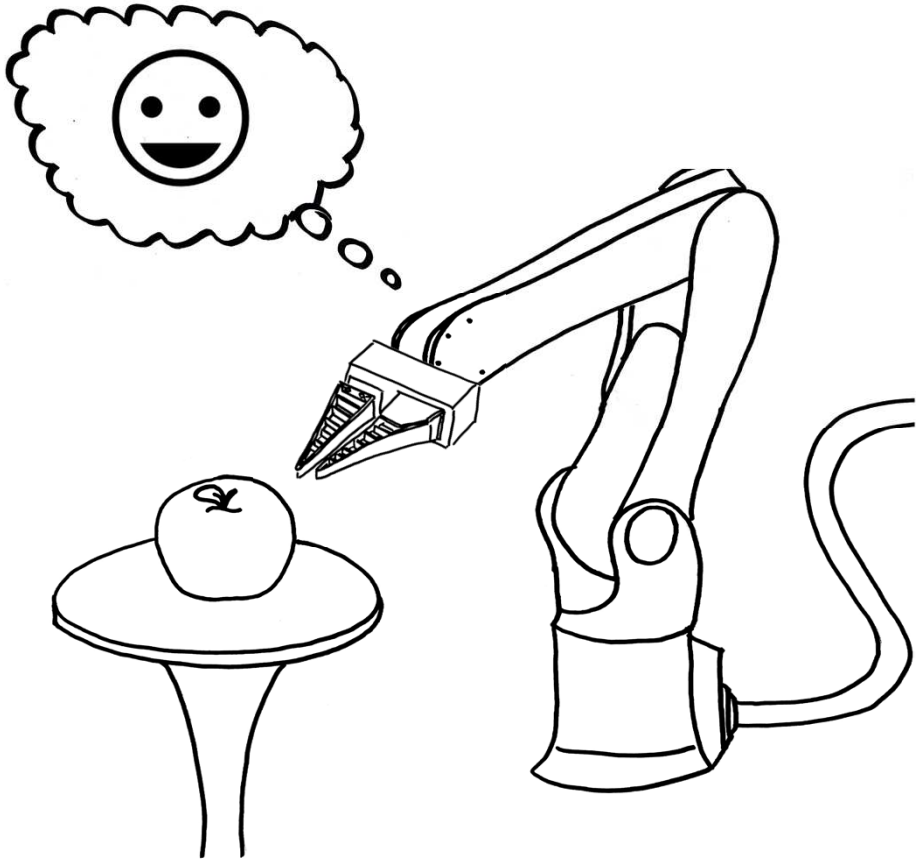
I now know how Frank can grasp an apple
Frank needs two Finray Fingers
> type: DHAS

Frank needs a parallel Gripper with long stroke
> type: HGPL

Frank can use the following control code
> motion_control.py

Thanks GripperAI!
I‘ll tell Tom!





Thanks to GripperAI Frank now knows what an apple is

Frank now knows how to recognize and grasp an apple (and an orange,…)

Frank is happy…

Thanks to GripperAI Frank now knows what an apple is

Frank now knows how to recognize and grasp an apple (and an orange,…)

Frank is happy…

If Frank is happy, Tom is happy

If Tom is happy, **FESTO** is happy!

WHAT is then next STEP?

COMBINING
Artificial Intelligence
with Human Skills

https://www.youtube.com/watch?v=5e0F14IRxVc

This Presentation was supported by:

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Simone Mangold
Dionysios Satikidis
Dr. Elias Knubben
& the Festo Bionik Team

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