sevensense

Sevensense Robotics

We build the eyes and brains for autonomous robots,
empowering them to navigate where no-one else can

MANAGEMENT, BOARD & TEAM

We are a team of outstanding robotics experts

LEADERSHIP

Dr. Gregory Hitz
CEO &
Board member

Dr. Marcin Dymczyk
CPO

Dr. Renaud Dubé
CTO

Gianluca Cesari
CBDO

Andreas Pfrunder
CFO

BOARD

Dr. Beat Kälin
Chairman of the Board

komax HUBER+SUHNER CabTec

Prof. Dr. Roland Siegwart
Board Member

ETH zürich NZZ Mediengruppe wingtra ANYbotics komax

Nora Teuwsen
Board member

ABB

Eric Lohrer
Board member

FONDATION BEYELER DePuy Synthes J&J

TEAM

A diverse team of 39 people of 20 nationalities

Spinoff ETH zürich

26 Engineers & Software developers

8 Sales, Marketing & Key Accounts

5 Management

9 PhDs in Robotics & Computer Science

17 Master degrees

STAGE

Founded in 2018, the company is at **scale-up stage**, with a total of **>13M CHF in investments** from investors such as ABB, ETH Zurich, and the Wyss Foundation.

ABB TECHNOLOGY VENTURES

ETH zürich

THE WYSS FOUNDATION

TODAY'S TECHNOLOGICAL MISMATCH

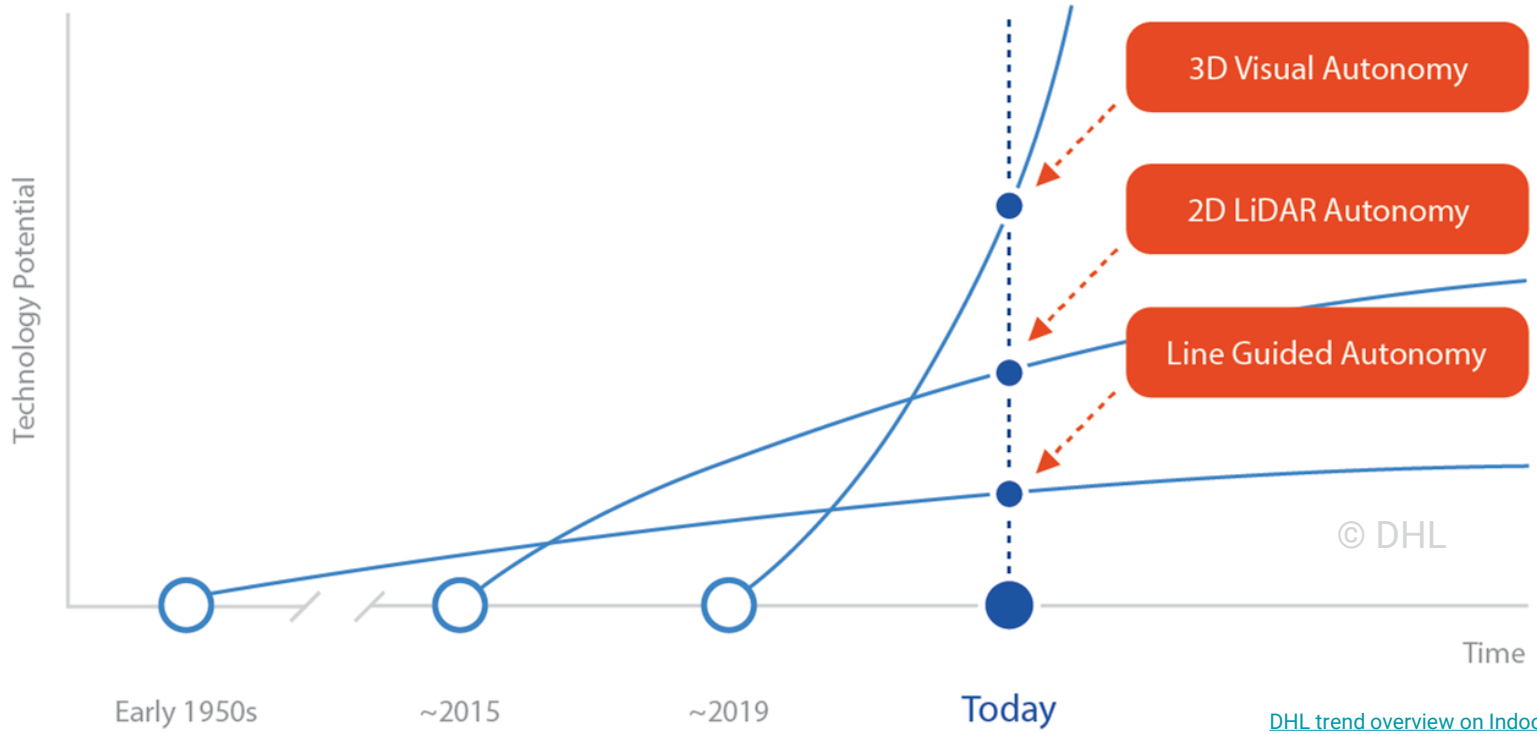
Mobile robots require human-like intelligence

- Today, the vast majority of tasks and processes that would benefit from using mobile robots **are still executed manually**, e.g. only 6% of warehouses employ mobile robots.
- In many industries, legacy technologies such as laser scanners and magnetic lines **cannot drive transformative automation**:
  a. Inflexible and limited capabilities
  b. Poor performance, especially in dynamic environments
  c. Expensive and tedious to install and maintain
  d. Requires personnel with special technical skills
- **Camera-based Visual AI** uniquely addresses these limitations for **all types of mobile (ground) vehicles.**

Source for warehouse statistics:
https://www.g2.com/articles/warehouse-automation-statistics

VISUAL AI THE CRITICAL TECHNOLOGY

Visual AI is the key enabler of autonomous mobile robots



DHL trend overview on Indoor Mobile Robots

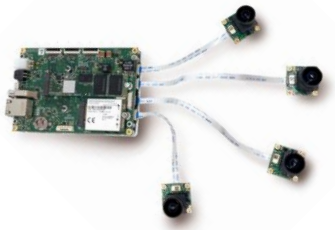
SOLUTION

Sevensense makes autonomy easy

We **address this market gap with** with

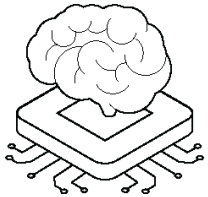
Alphasense Autonomy

- Hardware+Software product
- Sevensense is a Tier 1 Supplier for machine OEMs



Proprietary multi-camera system

+



Best-in-class AI software

Our customer: "Reflector needed every 10m, takes 30mins to install."

Assume 5km →
250 hrs of expert time!

Quick go-to-market for OEMs

- A complete autonomy suite
- Plug-and-play → quick low-cost integration

Superior camera-based technology

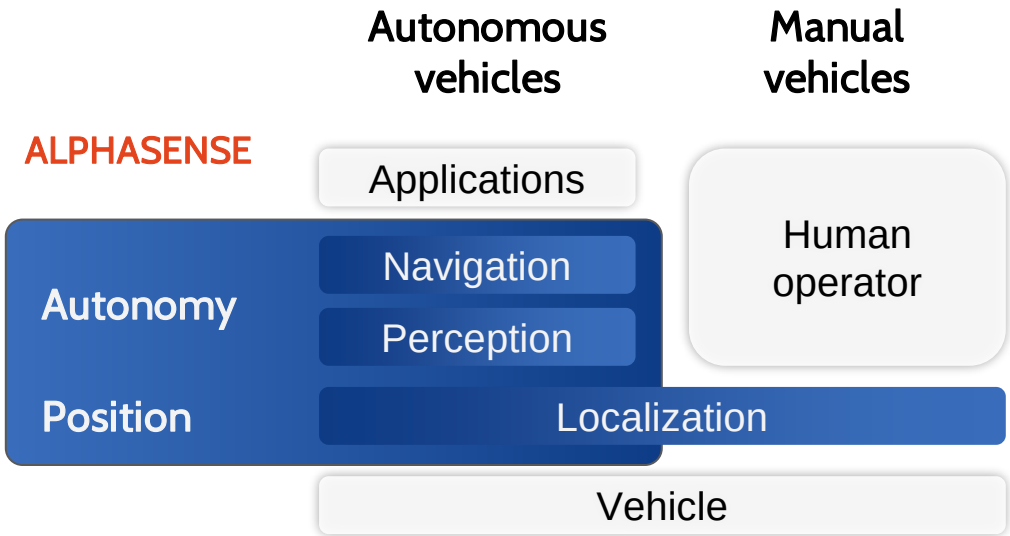
- Very quick to setup robots (reduction from weeks to hours)
- High precision (~4 mm) with no external infrastructure

Visual AI

- Artificial Intelligence on the Edge
- Human-like smartness when navigating

OUR PRODUCT

We enable all kinds of machine manufacturers to build smart robots



NAVIGATION SKILLS

AI enables autonomy in toughest environments

Video link: https://youtu.be/w3yFVBc44V4

Legacy tech:

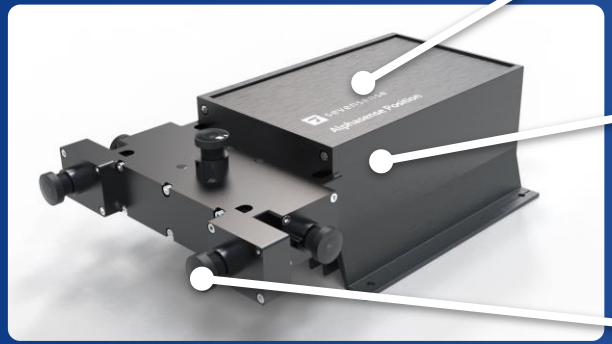
A **typical robot would simply get stuck** when its fixed path is blocked.

Sevensense tech:

A robot equipped with **Sevensense tech copes well with changing environment** and finds a way to the goal.

SENSING & PROCESSING

Robots need human-like intelligence



Alphasense Autonomy

AI engine

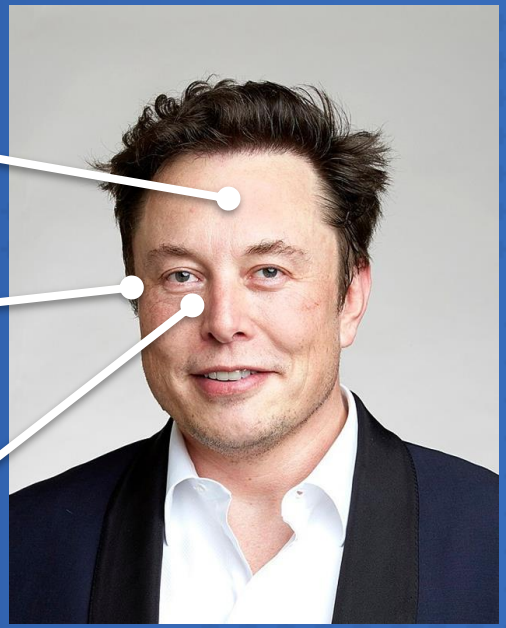
3 x 10^{10} neurons
500g
6W

Inner ear

2 accelerometers
3 gyroscopes

Eyes (stereovision)

20 bit dynamic range
120 megapixels
3 colors

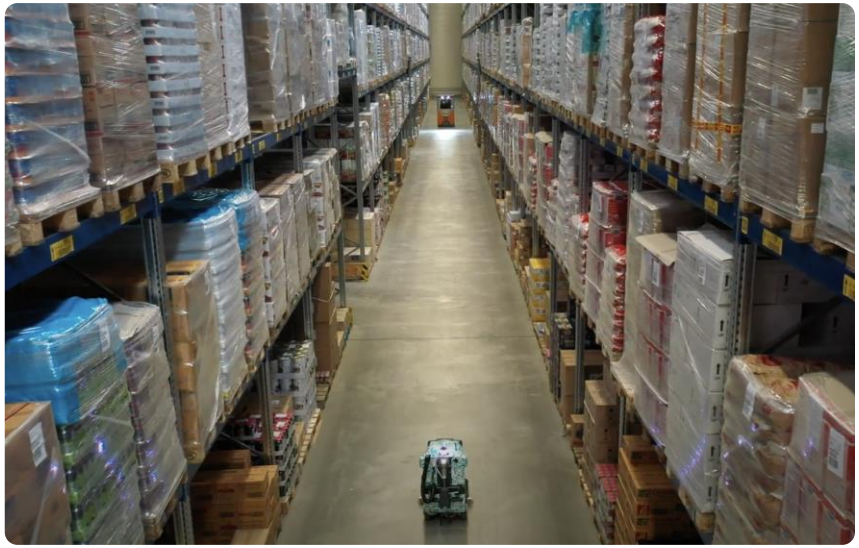


Elon Musk

"Humans drive through the eyes that see, and a brain made up of biological neural networks that analyze the information."

SEVENSENSE VISUAL AI

Our system tracks the environment like humans do



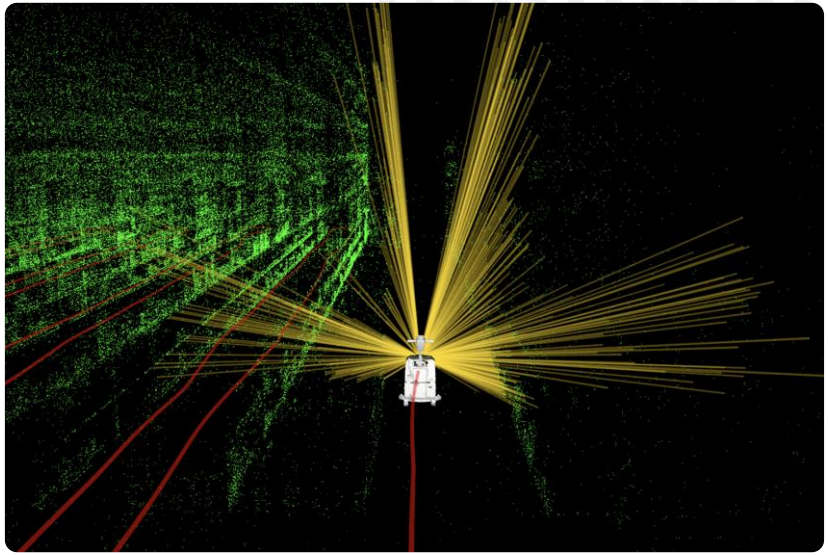
Highly dynamic environment, with **frequent changes at a floor level**.

Stream of frames with **Visual AI tracking**.

SEVENSENSE VISUAL AI

Our system tracks the environment like humans do

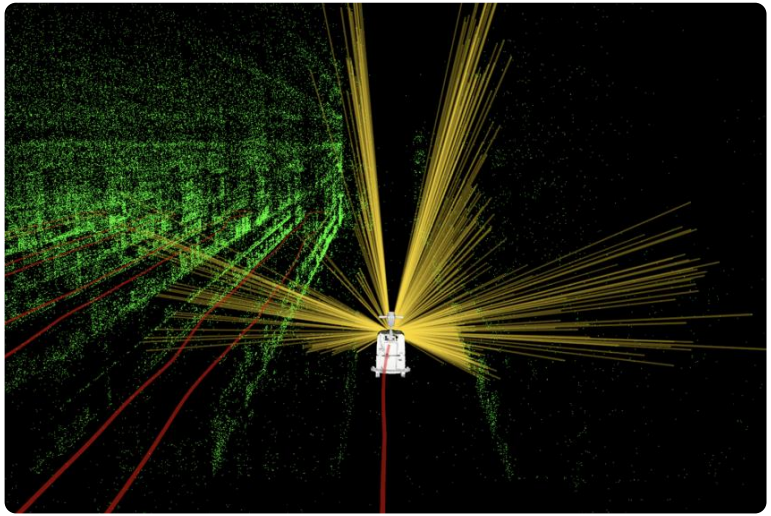
Stream of frames with **Visual AI tracking**.



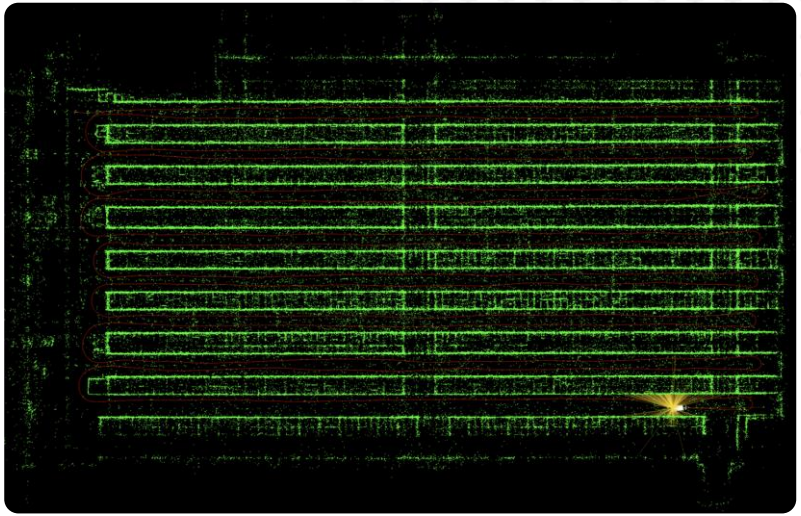
A **3D map (“digital twin”)** constructed from the Visual AI information.

SEVENSENSE VISUAL AI

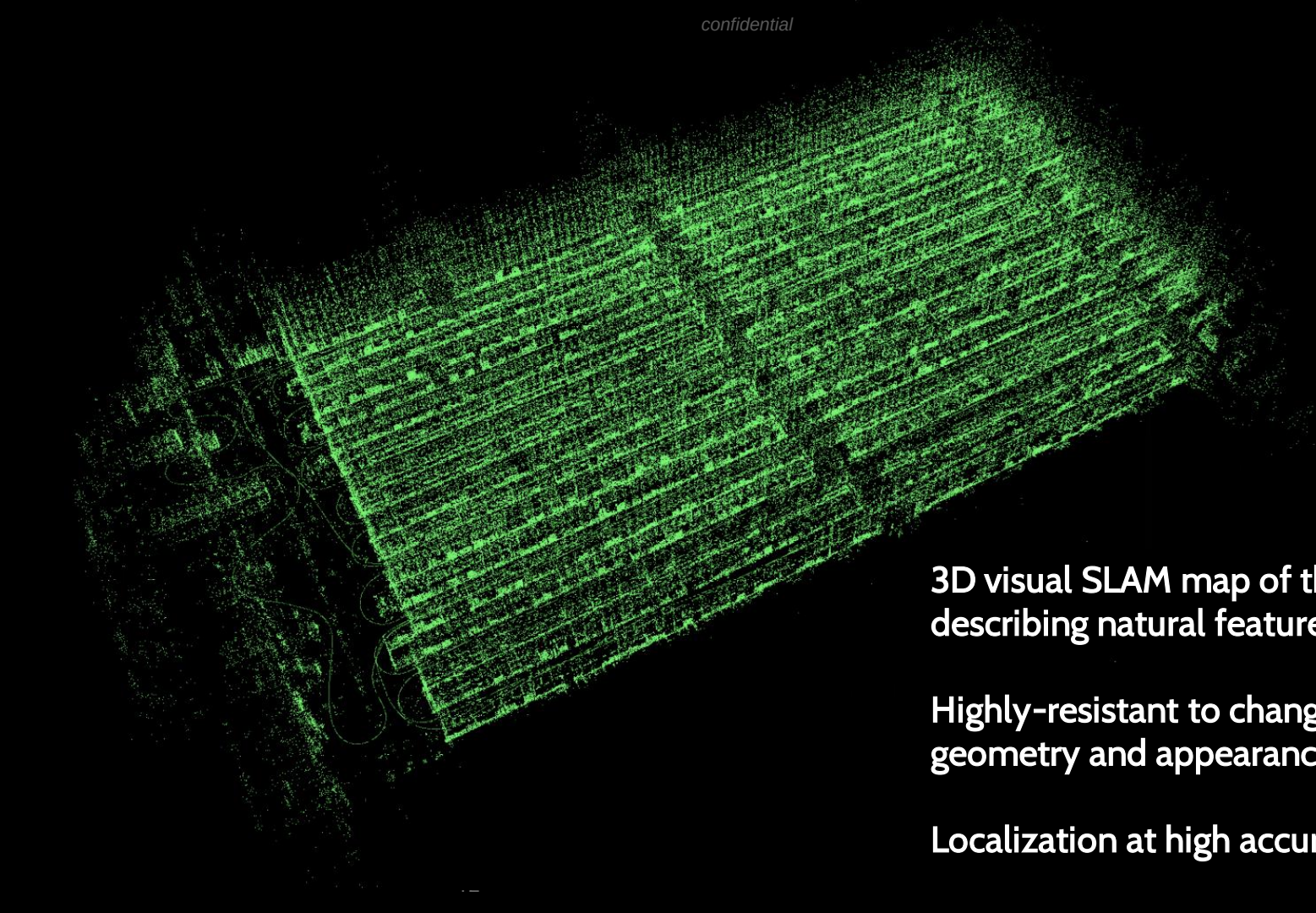
While moving, it creates a 3D model step-by-step



A **3D map (“digital twin”)** constructed from the Visual AI information.



Full, metric map of the entire environment.



3D visual SLAM map of the environment describing natural features in the space.

Highly-resistant to changes of the geometry and appearance.

Localization at high accuracy (< 1cm).

SUCCESS STORIES

Our technology is transformative for our customers

wetrok

Wetrok Discomatic Mambo, a **manual scrubber-dryer machine**

+

Alphasense
provides the eyes and brain

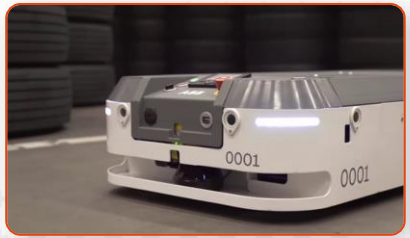
Robomatic Marvin, an autonomous cleaning robot

ABB

ABB-ASTI automated guided vehicles with **magnetic/lasers**

+

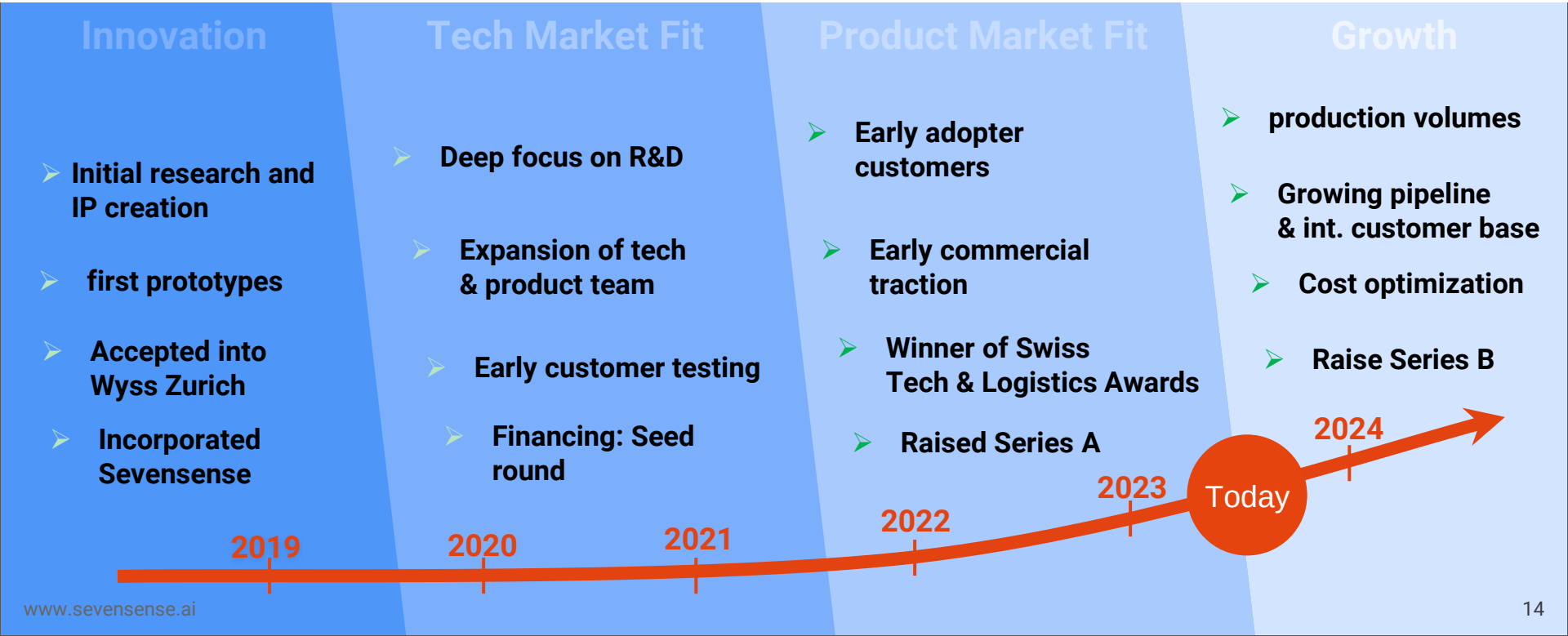
Alphasense
provides the eyes and brain



Flexley Tug T702V, a smart robot for flexible manufacturing

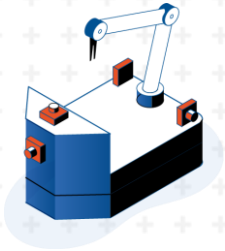
COMPANY ROADMAP

Progressing From Research to Commercial Scaling



Where are the technology gaps?

- The industry needs **Flexibility**:
  - **Smart sensing** to provide adequate **situational awareness**.
  - Standards for **interoperability**: Allows experts to concentrate on parts of the value chain.
  - **LiDAR free safety**: Expensive safety equipment is a blocker in many business cases.
  - **Flexible fleet orchestration**: Mixed operations with mobile robots, humans, and manually operated machines need adequate planning.



Spinoff ETH zürich

Wyss Zurich
Translating
Science into Life

VENTURE KICK

robotics Spin Fund

esa business incubation centre Switzerland

WISSENSCHAFT. BEWEGEN
GEBERT RÜF STIFTUNG

ETH Foundation