

Vision In Motion

Founded to enable organizations greater resilience and business continuity in an ever-changing world. Driven by the goal to be the benchmark for safer, smarter industrial mobility – for everyone, everywhere.

创立是为了要让客户公司在不断变化的世界中更具韧性和业务连续性
受为所有人、在各地成为更安全、更智能的工业移动性之基准的目标驱动

COMPANY DECK 公司简介

OCTOBER 2021年10月

Industrial automation is booming! So what's the problem?

工业自动化正蓬勃发展！那有什么问题吗？



The AMR* solution challenge

自主移动机器人解决方案的挑战



**AMRs
are expensive**

昂贵的
1.5吨载重的
自主叉车成
本要10万到25
万美元

1.5-ton payload
autonomous forklift
costs cost \$100K-\$250K



**AMRs are
limited in functionality**

Narrow field of view – tunnel
vision, limited ability to map
and understand the entire
environment and foresee
safety events

功能有限
视野狭窄、
隧道视觉、
测绘和了解
整体环境以
及预见安全
事件的能力
有限



**AMRs
lack interoperability**

The SW bottleneck problem -
different OS, navigation, and
different fleet management
systems

缺乏互操作性

软件瓶颈问题，
不同的作业系
统、导航和不同
的车队管理系统

*Autonomous Mobile Robots 自主移动机器人

Meet MAESTRO

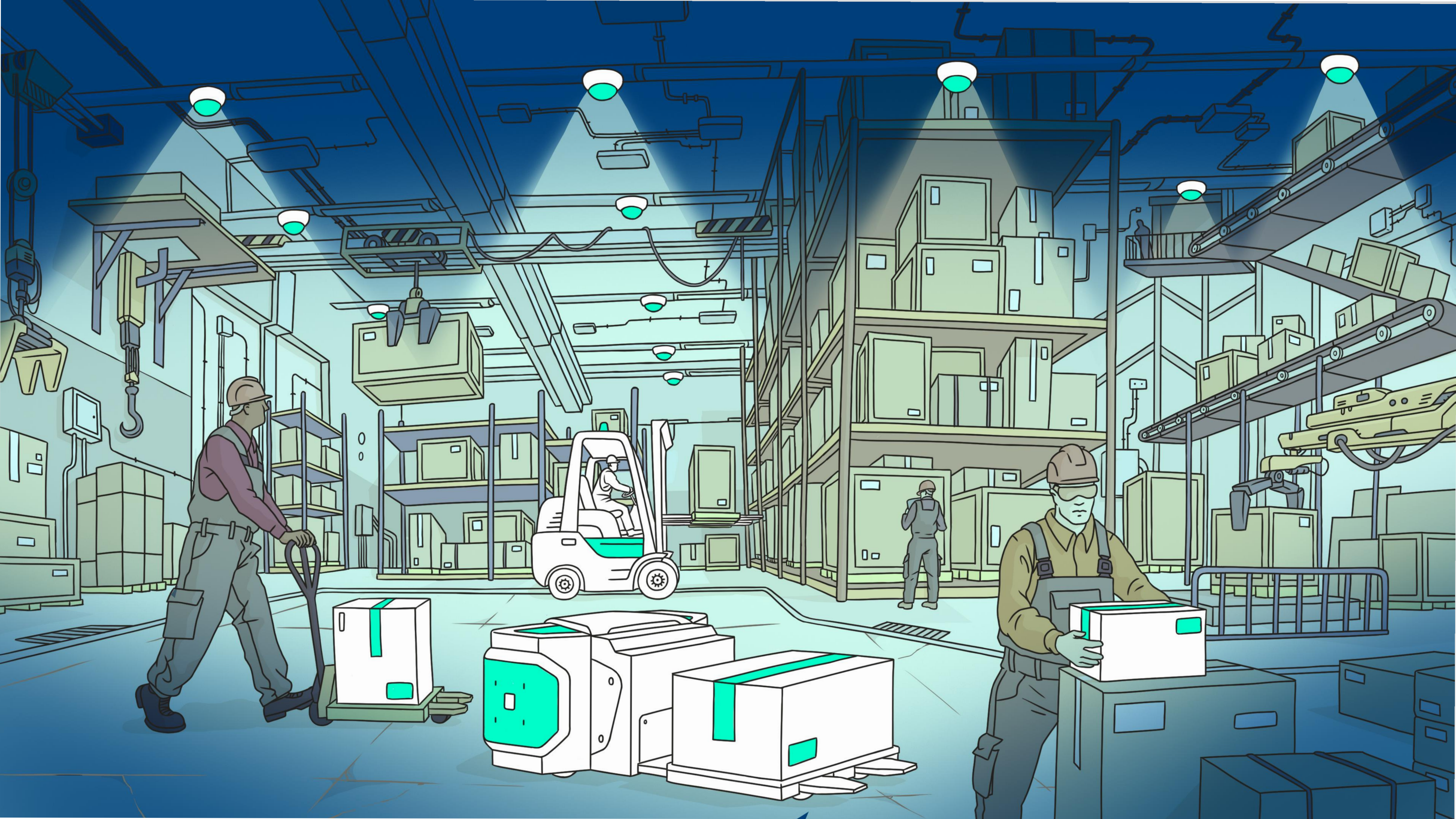
The enabler of the next-gen industrial indoor mobility management.

下一代工业室内移动管理的推手

A control tower that orchestrates anything moving on a floor.

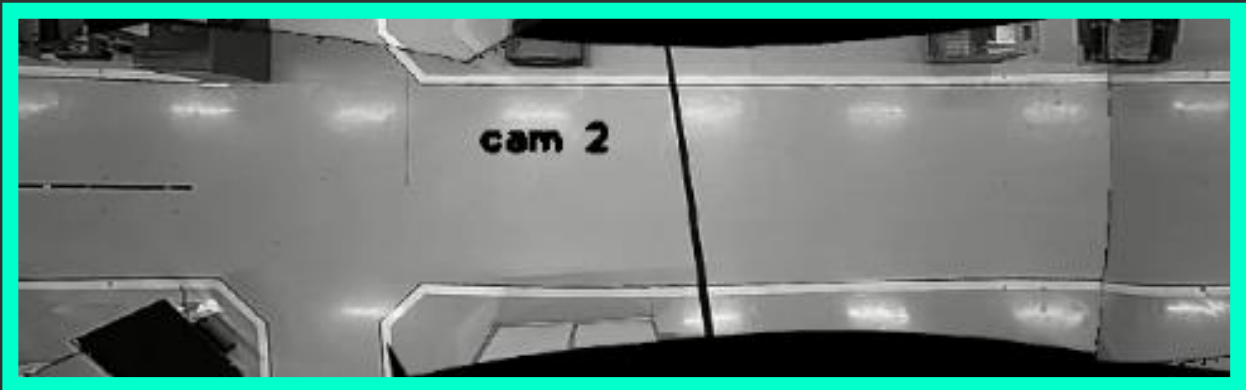
就像一个控制塔，协调在地面上移动的所有物件





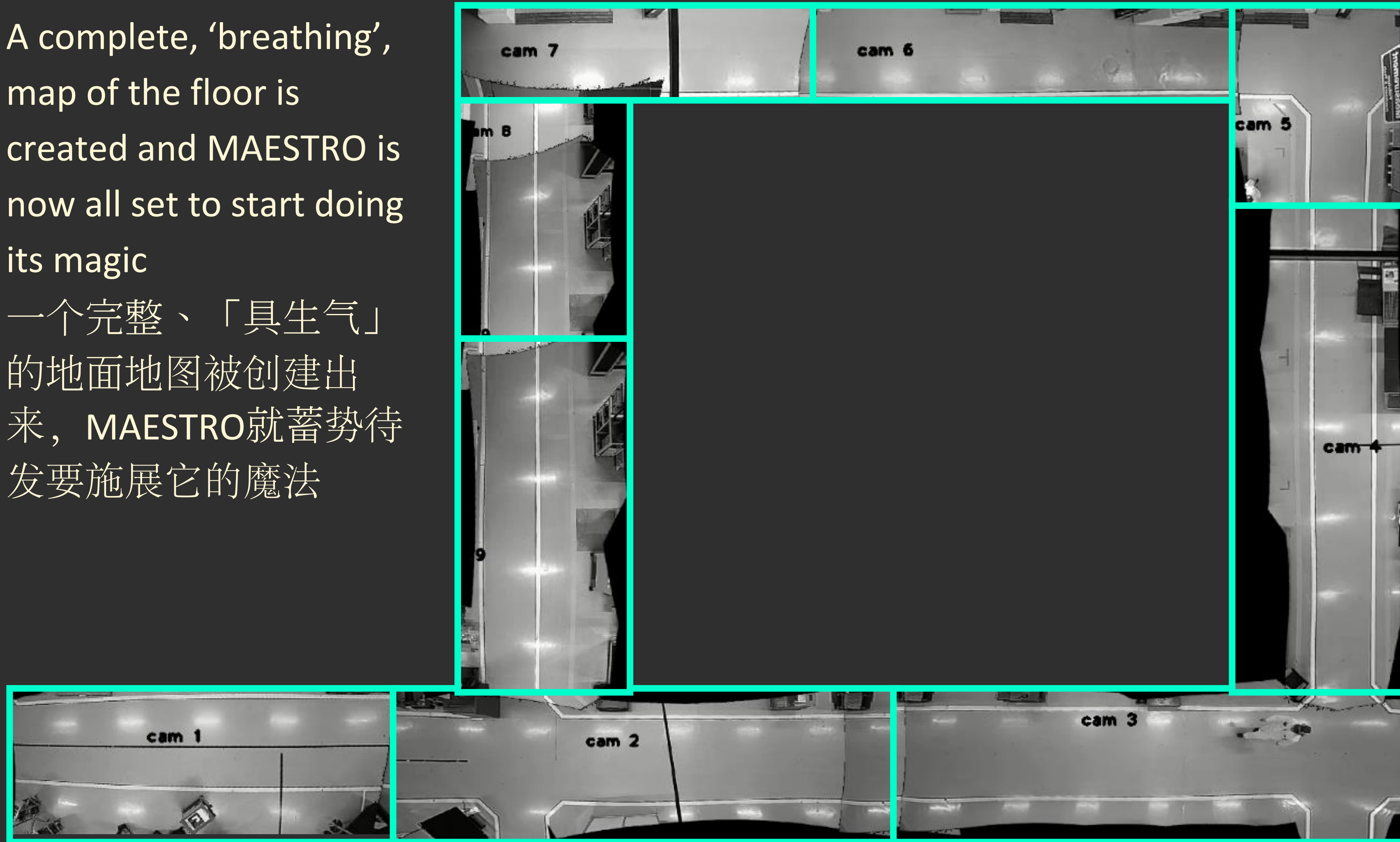
Continuous video stream
from discrete cameras is
stitched together and
rectified using a proprietary
computer vision technology.

离散摄像头的
连续视频流
会被拼接在
一起，并利
用具专利的
计算机视觉
技术进行
矫正

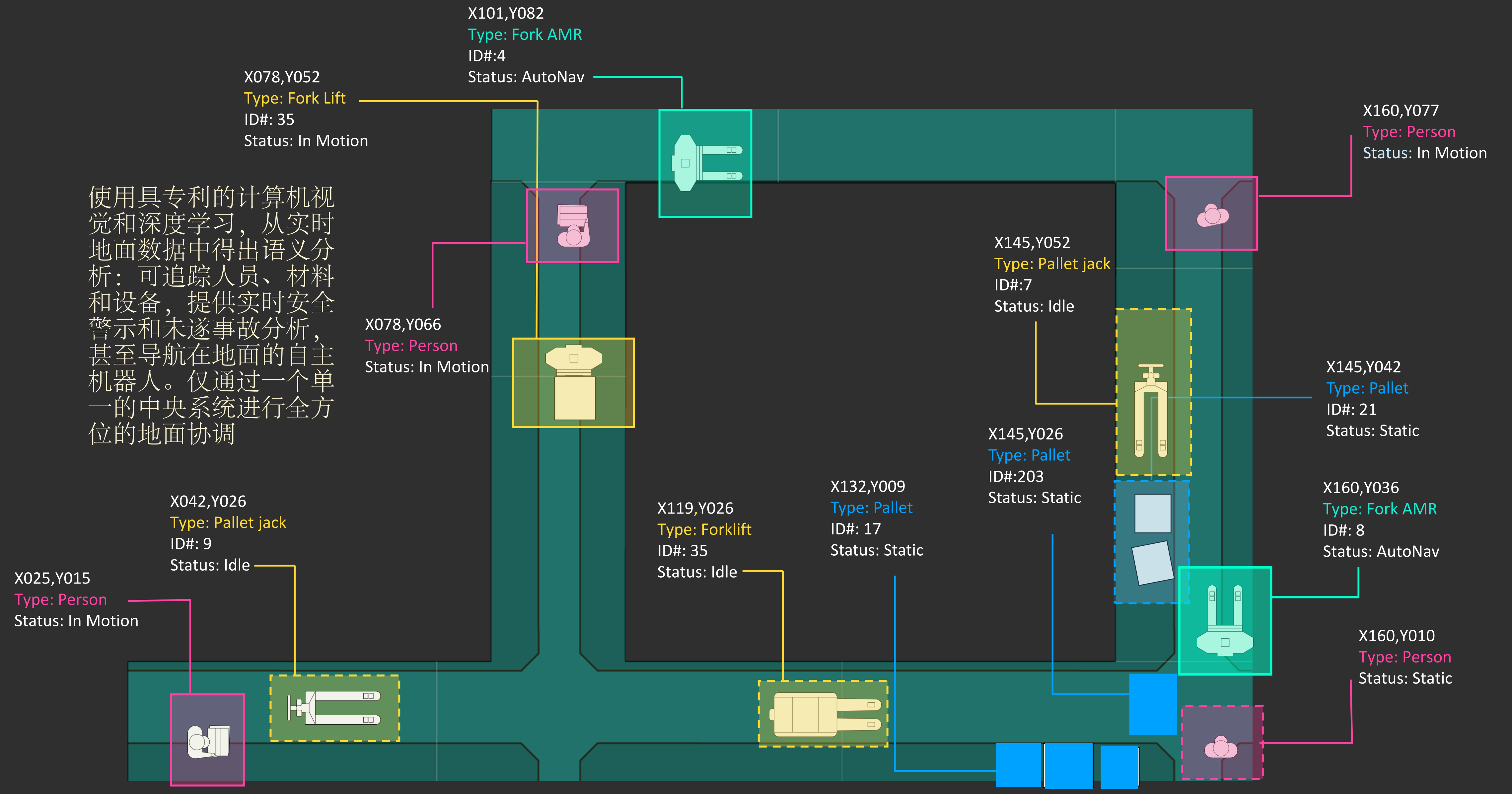


A complete, 'breathing',
map of the floor is
created and MAESTRO is
now all set to start doing
its magic

一个完整、「具生气」
的地面地图被创建出
来，MAESTRO就蓄势待
发要施展它的魔法

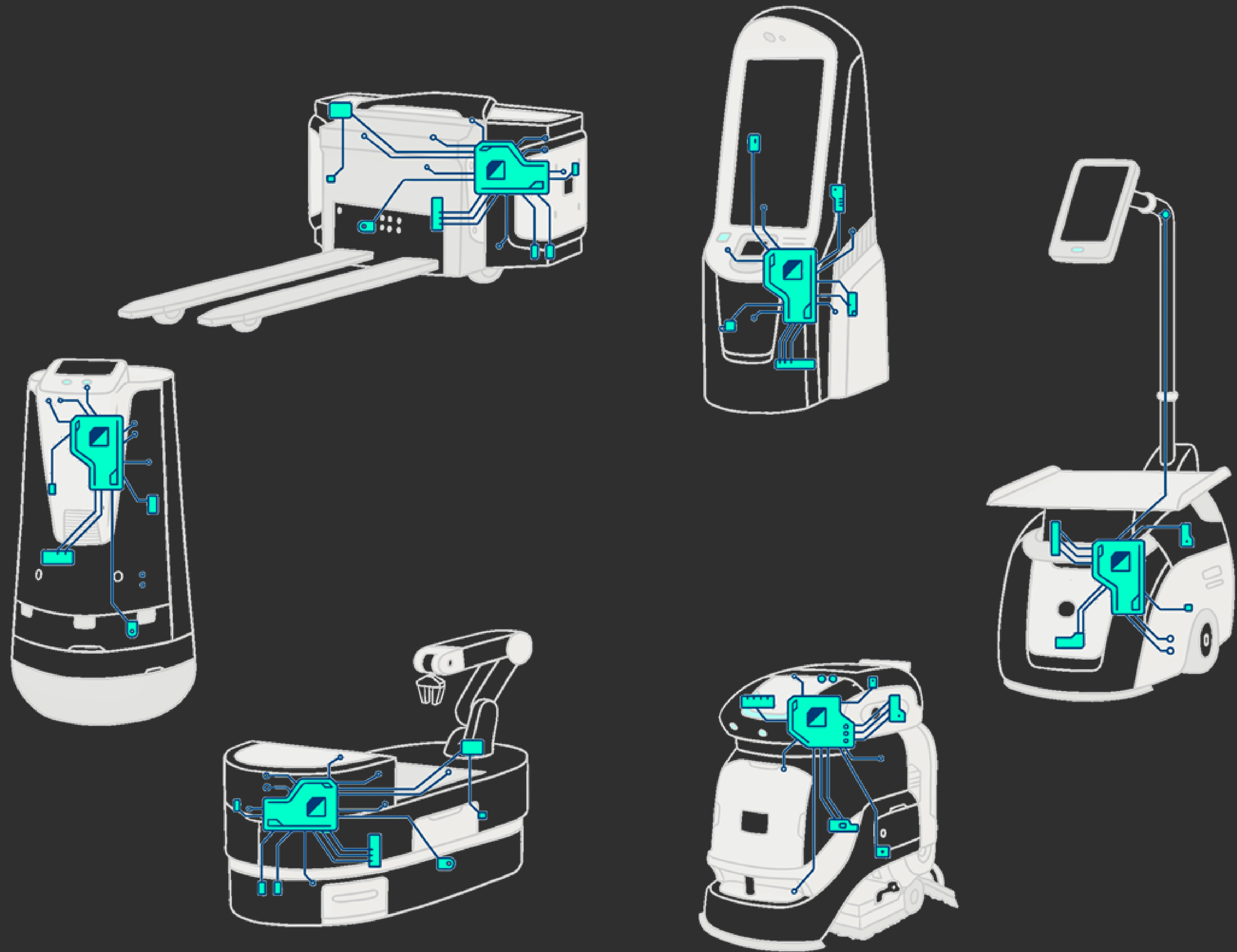


使用具专利的计算机视觉和深度学习，从实时地面数据中得出语义分析：可追踪人员、材料和设备，提供实时安全警示和未遂事故分析，甚至导航在地面的自主机器人。仅通过一个单一的中央系统进行全方位的地面协调



MAESTRO uses proprietary computer vision and Deep Learning to draw semantic analytics from real time floor data – from tracking people, material and equipment, providing real time safety alerts and near misses' analysis, and even navigating robots autonomously on the floor. All-around s floor orchestration through a single, central system.

**MOBILE ROBOTS
TRANSFORMATION
移动机器人的转型**

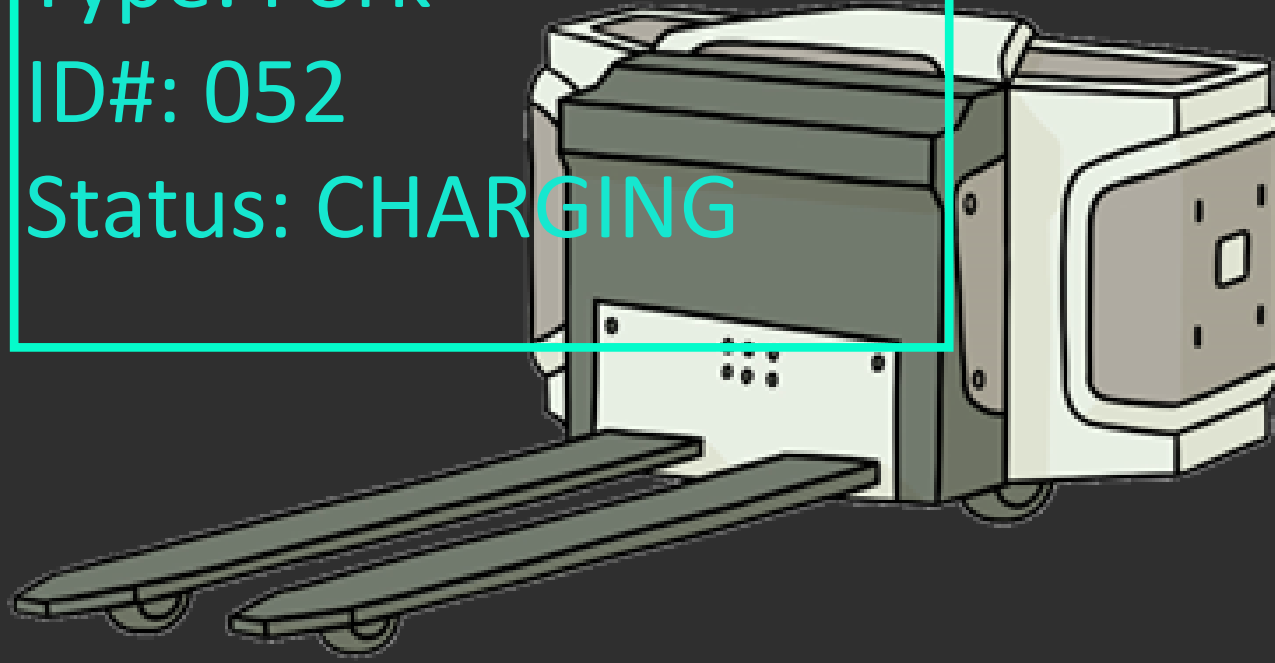


X345,Y456

Type: Fork

ID#: 052

Status: CHARGING

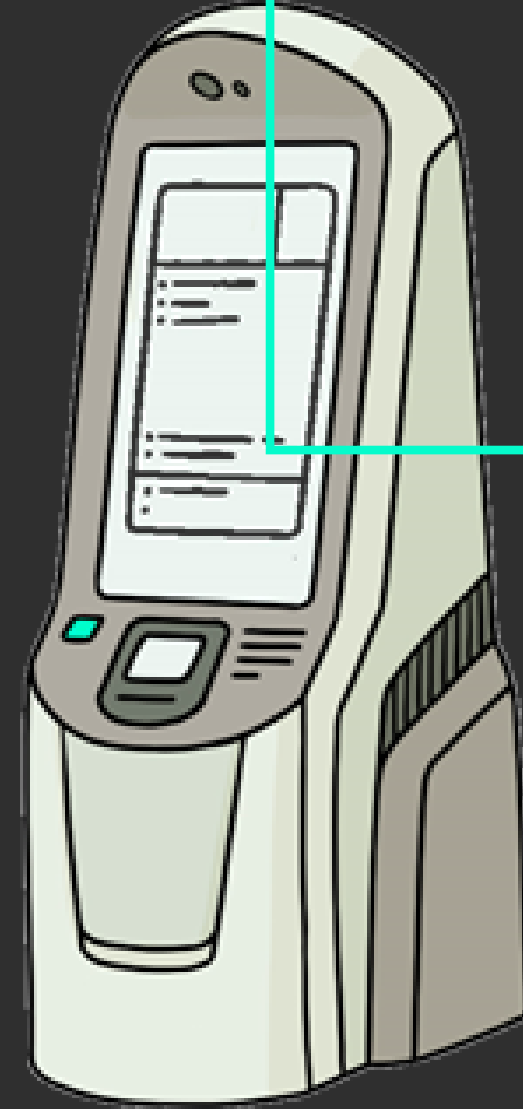


X345,Y456

Type: Kiosk

ID#: 102

Status: IDLE

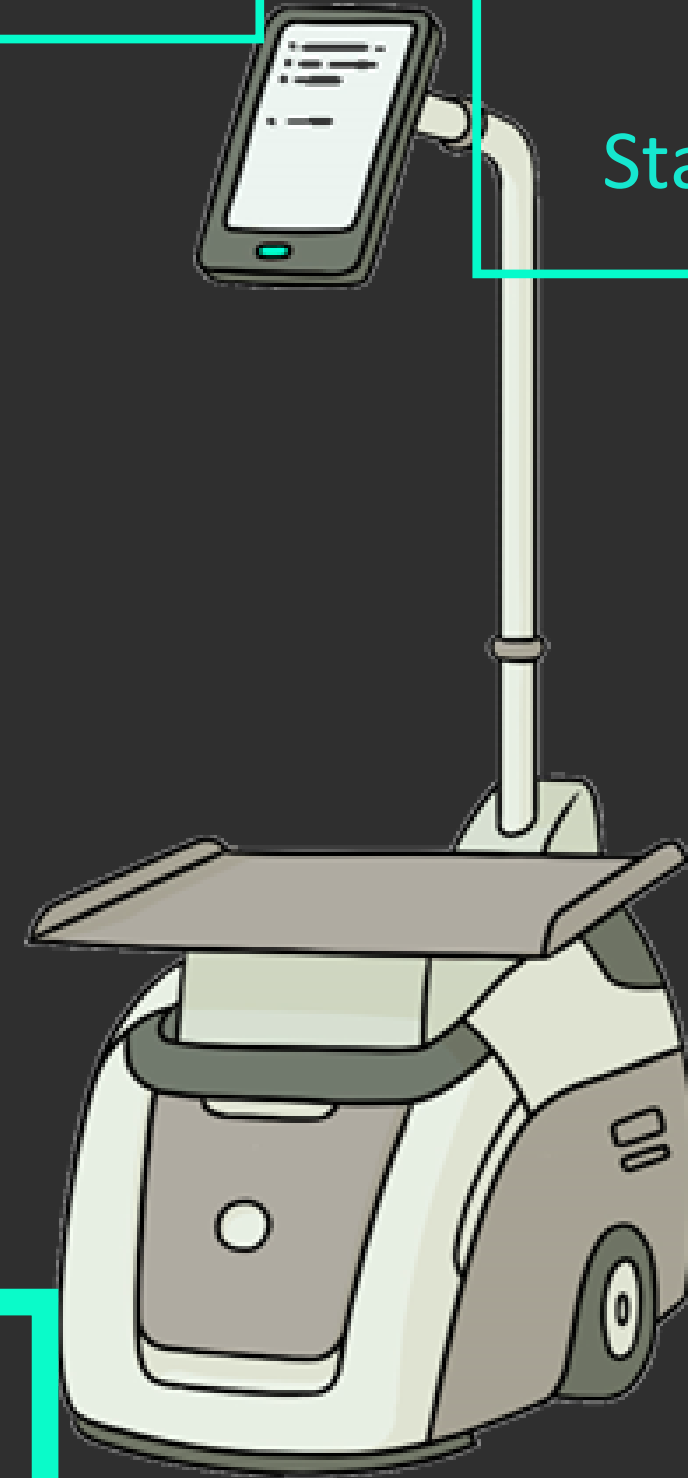


X392,Y445

Type: G2P

ID#: 004

Status: AutoNav

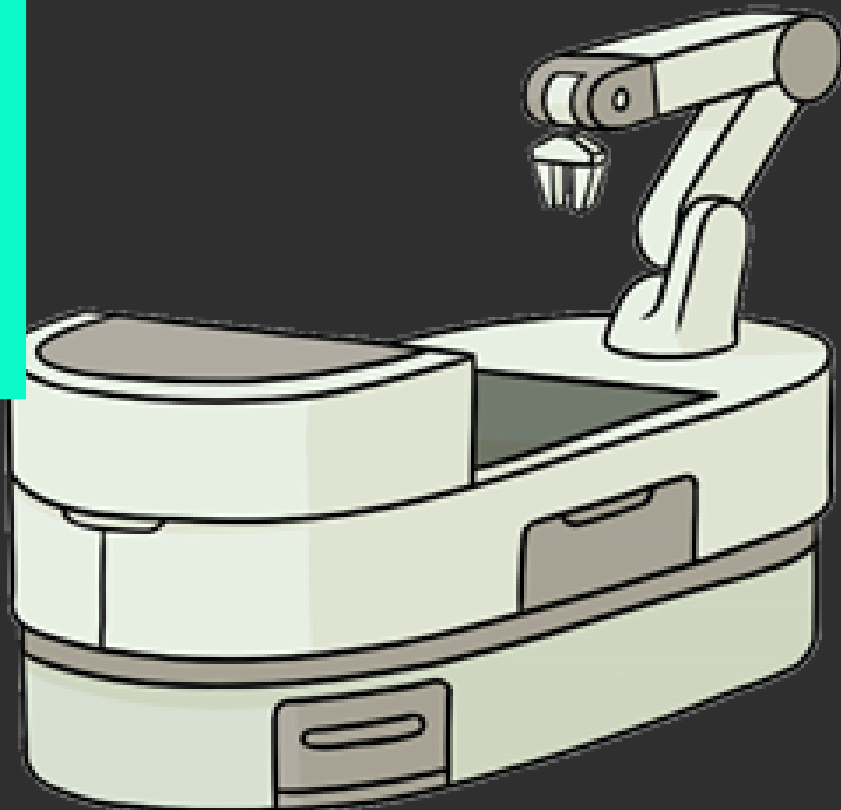
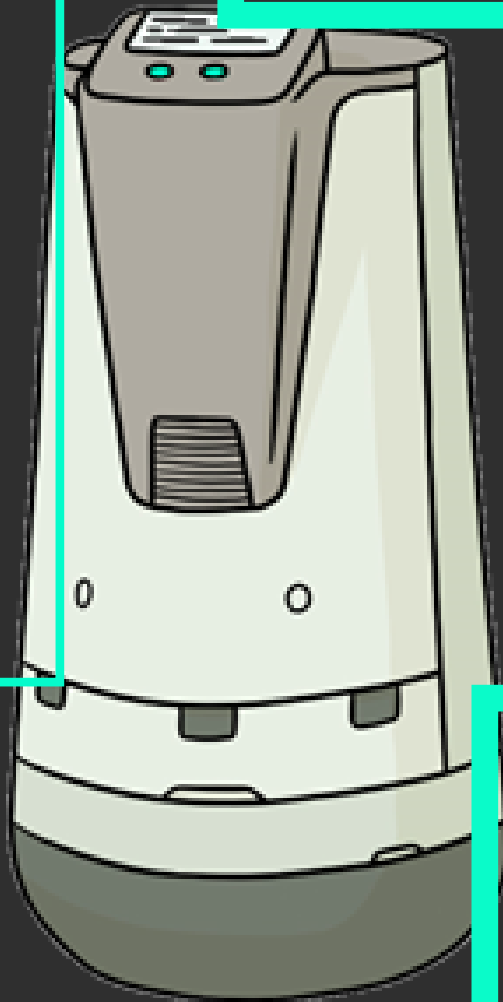


X325,Y427

Type: Security

ID#: 042

Status: STATIC



X340,Y390

Type: PICKER

ID#: 004

Status: AutoNav

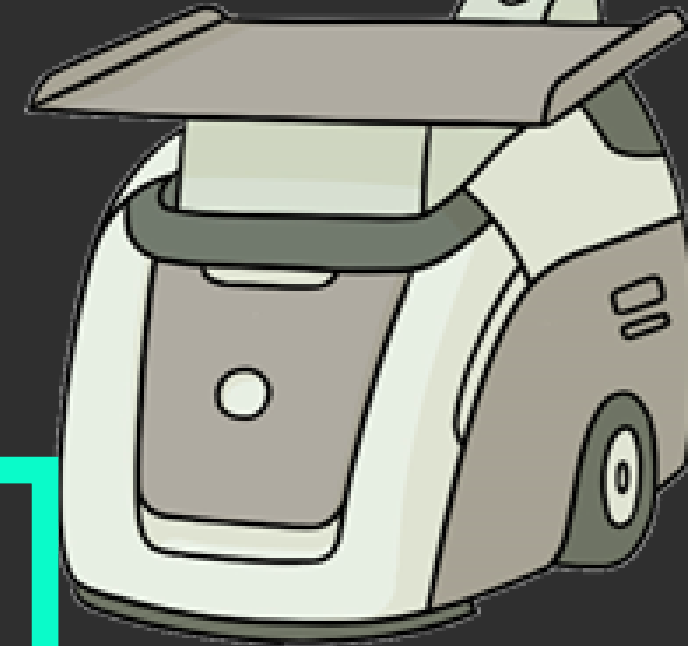


X367,Y390

Type: Scrubber

ID#: 027

Status: AutoNav



```
avg_FPS:9.288
frame time:0.105
read time:0.000
process time:0.097
post process time:0.000
DDS time:0.001
```



```
display time:0.026
Obstacle reduce time:0.000
First intersection step time:0.000
Unify time:0.000
get sdvState time:0.000
manual deletion by 'p' time:0.000
Second intersection step time:0.000
Obstacle deletion near sdvs time:0.001
block camera time:0.000
```

10

FPS: 19.054711315243118

drift: 0
distance from destination in cm: 2549
direction: 4

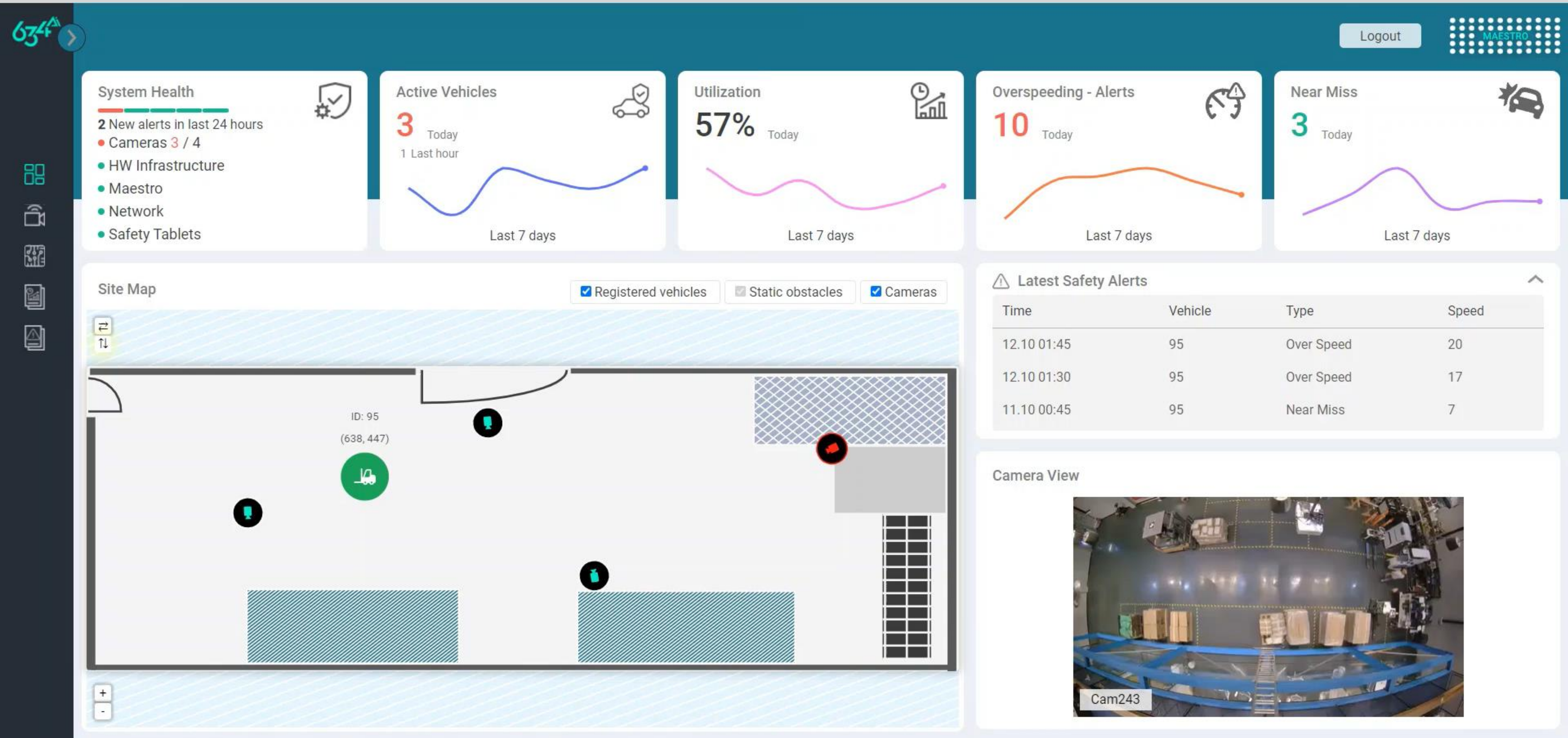
robotState: RobotState.DoingTask
mission: 61040d229add9d068717b9
special status: 0

(x=66, y=28) ~ R:0 G:0 B:255

Obst

Best of 2D
Bar ID: 67
(2576, 4988)
(59, 5074)

MAESTRO's User Interface 用戶界面



The dashboard features a top navigation bar with a logo on the left, a 'Logout' button, and the 'MAESTRO' brand name on the right. The main content area is divided into several sections:

- System Health:** Shows a progress bar and reports '2 New alerts in last 24 hours'. A list of components includes Cameras (3/4), HW Infrastructure, Maestro, Network, and Safety Tablets.
- Active Vehicles:** Displays '3 Today' and '1 Last hour' with a line graph for the last 7 days.
- Utilization:** Shows '57% Today' with a line graph for the last 7 days.
- Overspeeding - Alerts:** Displays '10 Today' with a line graph for the last 7 days.
- Near Miss:** Displays '3 Today' with a line graph for the last 7 days.
- Site Map:** A 2D map showing vehicle positions (ID: 95 at 638, 447), static obstacles, and camera locations. It includes toggle buttons for 'Registered vehicles', 'Static obstacles', and 'Cameras'.
- Latest Safety Alerts:** A table listing recent incidents.
- Camera View:** A live video feed from 'Cam243' showing a warehouse interior.

Time	Vehicle	Type	Speed
12.10 01:45	95	Over Speed	20
12.10 01:30	95	Over Speed	17
11.10 00:45	95	Near Miss	7

With semantic applications that enable robots to understand their environment at a much deeper level, and panoptic view of the floor for complete indoor mobility synchronization, MAESTRO is the new benchmark for a safer and smarter industrial mobility.

通过语义应用让机器人能更深入地了解所在的环境，并由地面全景完全掌握室内移动性的同步，
MAESTRO是更安全也更智能的工业移动新基准

X345,Y456
Type: Employee
Status: In Motion

X350,Y280
Type: Pallet Jack
ID#: 347
Status: In Motion

X355,Y270
Type: Fork AMR
ID#: 052
Status: In Motion

X415,Y650
Type: Forklift
ID#: 17
Status: In Motion

X422,Y265
Type: Pallet
ID#: 218
Status: In Motion

X520,Y630
Type: Employee
Status: Static

X565, Y250
Type: Employee
Status: Static

X566, Y249
Type: Box
ID#: 643
Status: Static

The market 市场

移动机器人市场的发展前景

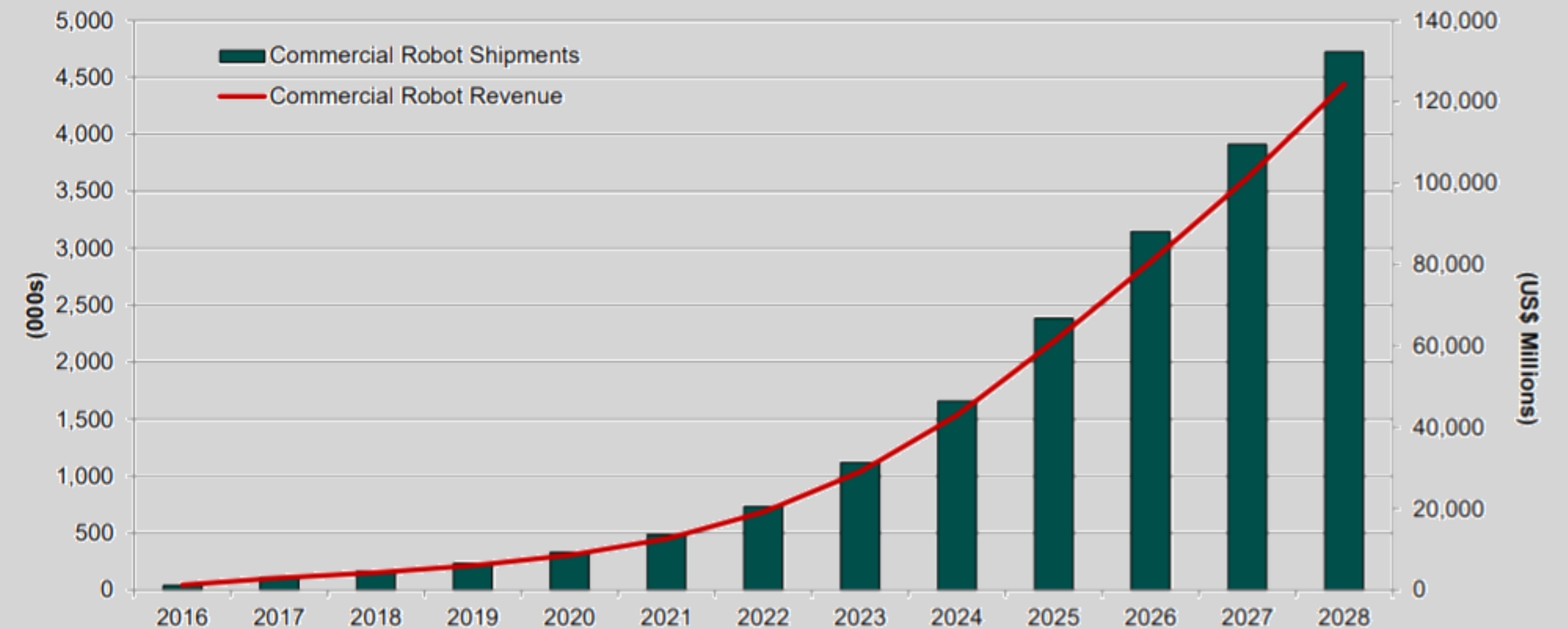
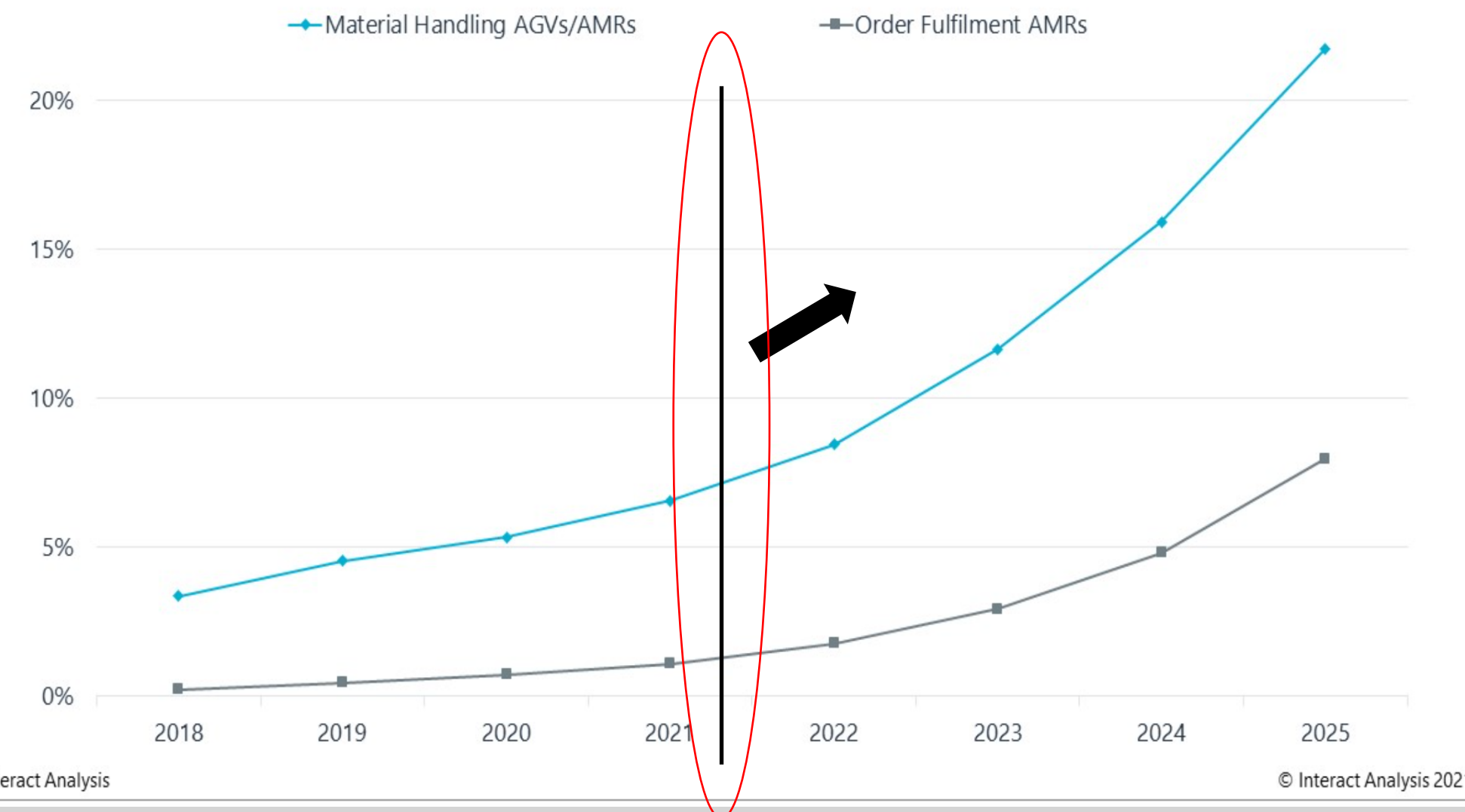
到2028年，全球将会有数百万个，全球年营收超过1200亿美元

The Mobile Robot Market Going Forward

Millions of Units and over US\$ 120 billion in global annual revenue by 2028

Penetration of Mobile Robots (Deployments/Total Customer Sites)

移动机器人的渗透率（部署数/客户总数）



- RTLS market size in 2020: **\$3.8B**, estimated at **\$24B** by 2028 (10 year CAGR of **28.7%**)
2020年实时定位系统市场规模：38亿美元，估计到2028年会达240亿美元（十年复合增长率为28.7%）
- Main growth drivers: logistics, healthcare, retail, manufacturing, automotive and transportation
主要增长驱动：物流、医疗、零售、制造、汽车和运输
- AMR market still in its virginal stage. **\$15B** in 2019; estimated at **\$120B** by 2028
自主移动机器人市场仍处于起步阶段。2019年为150亿美元；预计到2028年会达到1200亿美元
- Robots and automation management software reached **\$3.3B** in 2019; estimated at **\$160B** by 2030
机器人和自动化管理软件在2019年达到33亿美元；估计在2030年会达到1600亿美元

Competitive Analysis 竞争分析



RTLS 实时定位系统

Humatics, Comnovo
(Kion), Kinexon,
Uwinlock, Ubisense

Zebra

Broadcom

Zebra, Pole Star,
Quuppa, Intranav

634AI, Intranav

	UWB 超宽带	RFID 射频识别	Wi-Fi 无线网络	BLE 低功耗蓝牙	Vision based 基于视觉
Accuracy 准确性	10-30 cm厘米	3-5 m米	10-15 m米	3 m米	5-10 cm厘米
Coverage 覆盖	30-50 m米	100 m米	100 m米	20-50m米	100-300 m米
Latency 延迟	1 ms毫秒	1 s秒	3 s秒	3 s秒	300 ms毫秒
Battery Life (End Node) 电池寿命(终端节点)	2 years年	None无	10 days天	2-4 years年	none无
Disadvantages 缺点	Signals can be blocked by large metallic objects 信号可能被大型金属物体阻挡	Unsecure communication 通信不安全	Use of ISM band interference 用ISM波段干扰	Use of ISM band interference, low range 用ISM频段干扰 低范围	Requires line of sight 需要视线

Emerging 新兴

Most popular 最热门

MAESTRO provides superior accuracy, coverage area and ease of use real time object detection, classification and tracking without external energy source

MAESTRO提供卓越的精度、覆盖面积和易用性，无需外部能源即可进行实时物体检测、分类和追踪

AMR 自主移动机器人

Fetch, Vecna,
Agilox, Nipper

Seegrid, Gideon
Brothers

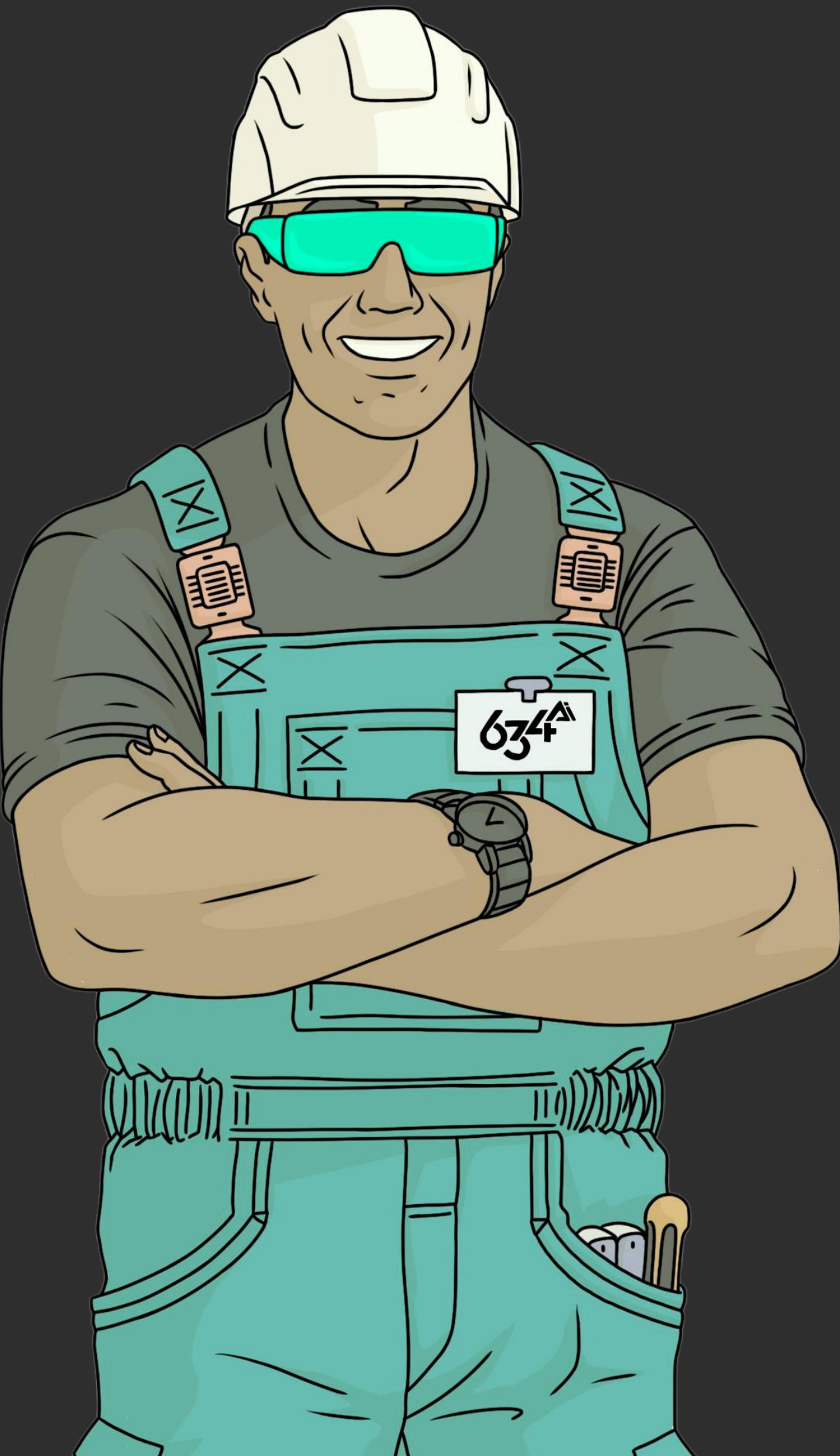
634AI, Logivations

	Traditional (Lidar-based) AMR 传统的(基于激光雷达)	On Board Vision based AMR 基于板载视觉	Ceiling/Wall Vision based AMR 基于天花板/墙面视觉
Safety 安全	several meters ahead. Man driven vehicles unaware of AMR 只向前看数米，注意不到由人所驾驶的车具	several meters ahead. Man driven vehicles unaware of AMR 只向前看数米，注意不到由人所驾驶的车具	All around visibility. Man driven vehicles aware of AMR 全能能见度：可以注意到人所驾驶的车具
Obstacle detection/ Efficiency 障碍物检测/效率	Fiew meters/Medium 几米/中	Fiew meters/ Medium 几米/中	All around/ High 全面/高
Interoperability 互操作性	Limited有限	Limited有限	Full and built in 跨平台并内置
Price (5 years) 价格(5年)	\$165K - \$300K	\$165K - \$300K	\$105K

MAESTRO proposes a new breed of AMR, with all around floor understanding, superior collision avoidance and superior uptime and efficiency at a new standard of price (40% lower TCO)

MAESTRO提出的是自主移动机器人的新品种，以新的价格标准(总拥有成本降低40%)，提供具全方位地面理解、极佳防碰撞功能和优秀正常运行时间和效率的自主移动机器人

Business model 商业模式



TIER 1 一级

VISION 视觉

- ✓ Real Time object detection, tracking & classification
实时物体检测、追踪和分类
- ✓ Productivity data
生产力数据
- ✓ Spaghetti diagrams & Heat Maps
意大利面条图和热力图

TIER 2 二级

VISION + CAUTION 视觉 + 警觉

Tier 1 functionalities plus:
第1级功能再加上

- ✓ Real Time obstacles detection
实时的障碍物检测
- ✓ Real Time collision detection & alerts
实时碰撞检测和警示
- ✓ Driving patterns and speed analysis
行驶模式和速度分析
- ✓ Near Miss detection and analysis
未遂事故检测和分析

TIER 3 三级

GUIDANCE 引导

- ✓ Vision-guided, AI powered AMR
视觉引导、人工智能驱动的自主移动机器人
- ✓ AMR autonomous task generation & navigation
自主移动机器人会自主生成任务和导航
- ✓ Fleet Management
车队管理
- ✓ Teleoperation
远程操作

TIER 4 四级

FLOOR MGMT. 地面管理

All functionalities:
所有功能

- ✓ All around indoor mobility orchestration
全方位的室内移动协调
- ✓ Full AMR-AGV-Man driven vehicles Interoperability
完全的自主移动机器人-自动导引车-人驱动车辆的互操作性

- NO UPFRONT CAPEX
没有前期的资本支出
- MONTHLY SUBSCRIPTION FEE 月订阅费
- UP AND RUNNING WITHIN DAYS
几天内即可投入运行
- OPEX EFFICIENCIES FROM DAY 1
从第一天起就让运营成本有效率

Go to market 进入市场

Cloud service providers
云服务供应商

Fleet Management SW
车队管理软件



Autonomy Solution Providers
自主性解决方案供应商

AMR Manufacturers
自主移动机器人制造商

RTLS Manufacturers /
Integrators
实时定位系统制造商/集成商

Key facts 要点

- Founded in 12/2019 成立于2019年12月
- Carve out and spin off in 10/2020 于2020年10月分割和分拆
- Raised more than \$7.6M to date (10/2021)
直到2021年10月为止，融资金额超过760万美元
- Japanese Musashi Seimitsu, a multi Billion-dollar global Tier-1 Auto part manufacturer and a Honda Motor subsidiary as shareholder and first customer
有日本武藏精密工业，一个本田汽车子公司、价值数十亿美元的全球一级汽车零部件制造商作为股东和第一批客户
- 3 successful POCs in Japan and Germany
在日本和德国有3个成功的概念验证
- Partnerships with Matrix (Israel and Europe) and with InOrbit (US)
在以色列和欧洲与Matrix，在美国则与InOrbit建立伙伴关系
- Advanced collaboration discussions with Continental, Schaeffler, VDL, P&G
与大陆集团、舍弗勒、VDL、宝洁公司进行进阶合作洽谈



About us 关于我们



Founded by visionaries, enthusiasts & technology experts to make life better for humans + robots.

由远见者、爱好者和技术专家成立，让人类加上机器人的生活更美好

The team 团队



Onn Fenig, CEO 首席执行官

Entrepreneur and senior executive; Ex Rioglass Solar Systems CEO, assumed senior leadership positions in companies such as Siemens and Cisco Systems

创业家和高管身份、前Rioglass Solar首席执行官、也曾担任西门子和思科等公司高管



Eyal Yoskovitz, PHD, VP Product 产品副总

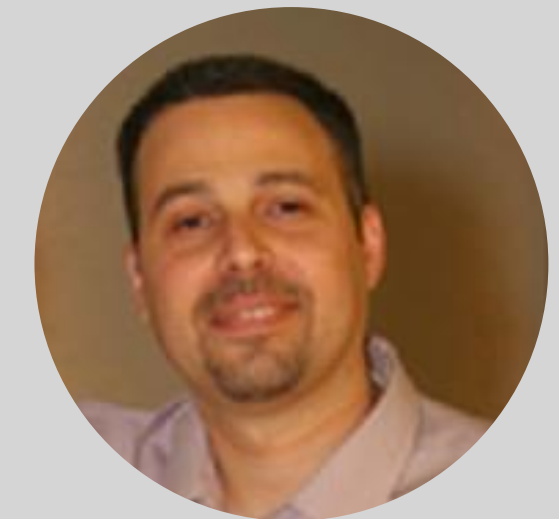
Entrepreneur and senior executive; PHD in Nano Optics; Ex CEO of Bactusense Technologies, assumed technical leadership positions in companies such as Intel and Cisco Systems

创业家和高管身份、纳米光学博士、Bactusense Technologies前首席执行官、也在英特尔和思科等公司担任过技术领导职务



Arik Rofe, CTO 首席技术官

Ex Powermat Lead Engineer, Hardware experts with over 20 years of engineering experience
前Powermat首席工程师，拥有超过20年工程经验的硬件专家



Sagi Dolberg, Head of Algo & AI 算法和人工智能总监

Ex Head of Algo & AI Group at Vayavision; Machine Learning and image processing expert; assumed technical leadership positions in companies such as Bird Aeronautics, Alvarion and IAI

Vayavision前算法和人工智能部门负责人、机器学习和图像处理专家、曾在Bird Aeronautics、Alvarion和以色列航天航太工业等公司担任技术领导职务



Rotem Tzuk, VP R&D 研发副总

Ex VP R&D BioEye, Ex Head of Engineering at Waves; Over 20 years of progressive software development experience

BioEye前研发副总裁、Waves前工程主管、有超过20年的渐进式软件开发经验



Shlomi Hatan, VP Biz Dev 商务拓展副总

Ex Netafim Head of Industry 4.0, Ex Rioglass COO, assumed senior leadership positions in companies such as Siemens and HP

Netafim前工业4.0部门负责人、Rioglass前首席运营官、也曾西门子和惠普等公司担任高级领导职务



Ran Poliakine, Co-Founder, Chairman 联合创始人、董事长

Serial Entrepreneur with over 30 years of experience; Founder of Powermat, Wellsense, Illumigyn, Nanox (NASDAQ: NNOX), SIXAI

联合创始人、董事长 拥有超过30年经验的连续创业家、是Powermat、Wellsense、Illumigyn、Nanox(NASDAQ: nnox)、SIXAI的创始人



Hiroshi Otsuka, Co-Founder 联合创始人

Chairman, President and CEO of Musashi Seimitsu Industry, a Honda Motor company

本田汽车公司旗下武藏精机工业公司董事长、总裁和首席执行官

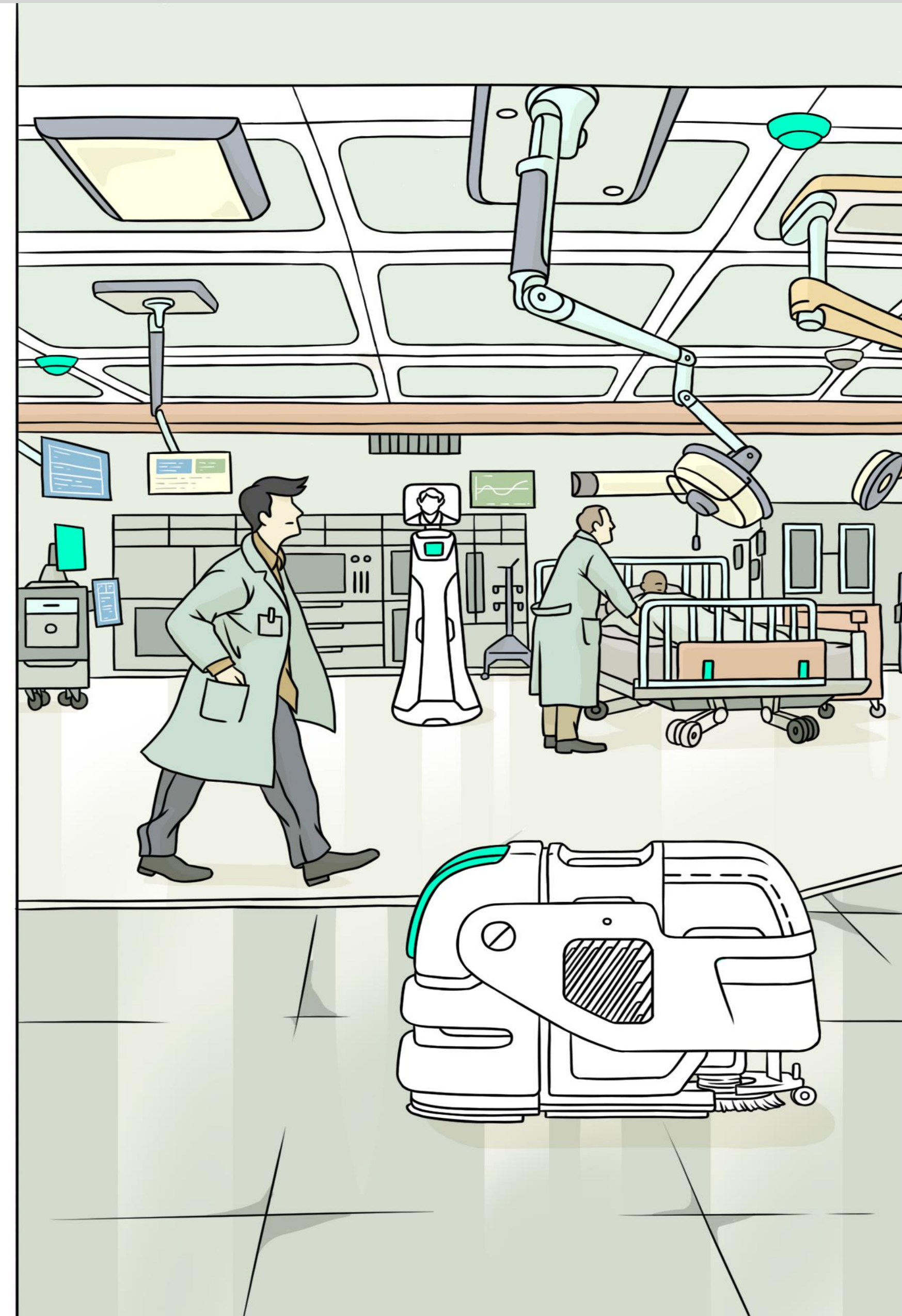
Take home message 总结

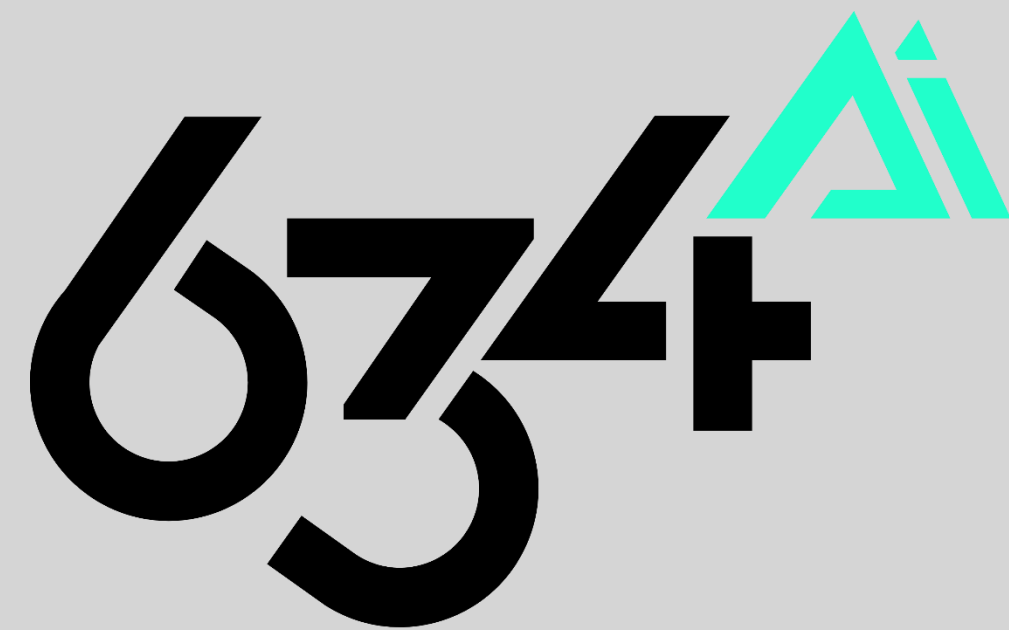
- The only fully integrated floor management solution for a busy man-robot environment
唯一为繁忙的人与机器人交互环境提供的全集成地面管理解决方案
- Space and platform agnostic system, able to complement with and integrate into almost any existing platform
跨空间和跨平台的系统，能够补充和集成到几乎任何现有平台上
- Plug & play, suitable for Greenfield and Brownfield operations alike
即插即用，适用于绿地和棕地等相似应用
- Floor management solution superior in price, effectiveness, safety and interoperability
在价格、有效性、安全性和互操作性方面具优势的地面管理解决方案
- Strong and flexible business model, allowing fast market scale
强大而灵活的商业模式，允许快速扩展市场规模
- Committed strategic investors who are long term players
有具承诺战略投资者的长期参与
- Experienced execution team, speaking both the 'Dinosaurs' and the 'Astronauts' language
经验丰富的执行团队，懂得行内外的语言

We offer practical and affordable tools for indoor mobility in the digital autonomy era.

We're on a mission to make any indoor task autonomous – from warehouses and industrial floors, to the hotel, hospital, airport and beyond.

我们为数字自主时代的室内移动提供实用又实惠的工具
我们的使命是让任何室内任务都能自主完成，从仓库和工业车间，到酒店、医院、机场和其他地方





Vision In Motion

Join our orchestra!
加入我们!

Onn.f@634.ai

www.634.ai