



INOHK HONG KONG CENTER FOR CONSTRUCTION ROBOTICS



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- New Engineering Education
- Innovation Camp



01 Center Profile



Introduction

The InnoHK Hong Kong Center for Construction Robotics (HKCRC) is a world-leading innovation platform dedicated to advancing smart construction. Established in 2020 under the Hong Kong SAR government's InnoHK initiative, HKCRC is a collaboration between the Hong Kong University of Science and Technology (HKUST) and the University of California, Berkeley.

Led by Professor Li Zexiang from HKUST, HKCRC brings together a team of top global researchers and industry experts, focusing on three core domains: Construction Robotics, Smart Machinery, and Smart Operations and Maintenance.

HKCRC delivers breakthrough technologies that redefine productivity, safety, and sustainability, creating real-world impact across the construction ecosystem.

2020

- HKCRC Established
- Takes up Residence at Hong Kong Science Park
- First Industry Advisory Committee Formed
- First R&D Team Moves into HKCRC



2022

- Organized Industry Seminar on Intelligent Construction Projects
- InnoHK Innovation Hong Kong Research Platform Launched
- Held the Summer “Dream Building Plan” Technology Innovation Training Camp
- Participated in the Construction Innovation Expo 2022



2024

- Signed a MOU with the Housing Bureau
- Participated in the LEAP technology exhibition in Saudi Arabia, marking the first overseas exhibition of our products
- Awarded the Grand Prize at the Geneva International Exhibition of Inventions, the Red Dot Award, and the Hong Kong Awards for Industries
- Participated in the International Construction Robotics Day, Beijing International Construction Expo, BEX Asia in Singapore, and The Big 5 Global in Dubai, expanding influence both domestically and internationally



- Organized the Hong Kong Future Technology Summit
- Co-organized the 2nd “Future Construction with Intelligent Innovaiton” Construction Robotics Competition
- Co-organized the Winter Training Camp
- The Center was successfully renewed
- Successfully incubated two innovative companies : Insight Technology and Beaver Intelligence



2021

- The First Science and Innovation Training Camp Held
- First HKCRC-HKUST Joint Master’s Program Enrolls Students
- Center Selected for InnoHK Project
- Winter Training Camp “Entrepreneurship Trainees” Launched



2023

- Hosted the 2023 China (Chongqing) International Intelligent Construction Industry Conference
- The SkylandX Team Won the Championship at the “Elevator Pitching Competition 2023”
- Collaborated with ROBOCON to Advance Technological Innovation
- Organized Two Training Camps

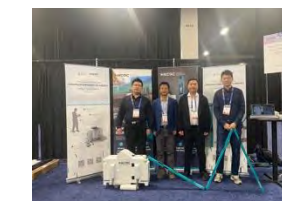


- Successfully Incubated Three Innovative Companies: SKYLAND INNOVATION, ZOEROBOT, and JBOT



2025

- Organized a “Martial Arts Competition” or construction robots with the Housing Bureau
- Signed cooperation agreements with Zhejiang Construction Engineering Machinery Group Co., Ltd. and other institutions
- Participated in major exhibitions including the Consumer Electronics Show (CES) in the United States, GITEX ASIA 2025 in Singapore and UK Construction Week
- Successfully organized the Smart Construction Summer Training Camp and Winter Mini Camp
- The AI Tower Crane System has Honored at CIC Innovation Award.
- Successfully incubated the innovative startup: CraneR Technology



To Become the Innovation Engine for Smart Construction

30+

Domestic & International
Awards

40+

Patents

15+

Products

Our Team

Center Director

Prof. Zexiang LI IEEE Fellow



- ◆ Colin Yam Ko Yin Professor of Engineering, HKUST
- ◆ Professor, Department of Electronic and Computer Engineering, HKUST
- ◆ Co-founder of DJI, QKM, ePropulsion, etc.
- ◆ IEEE Robotics and Automation Award, 2019
- ◆ Founder of XbotPark
- ◆ Founder and Dean of Shenzhen InnoX Academy

Interdisciplinary Excellence

A team of experts from diverse academic and professional fields

International Background

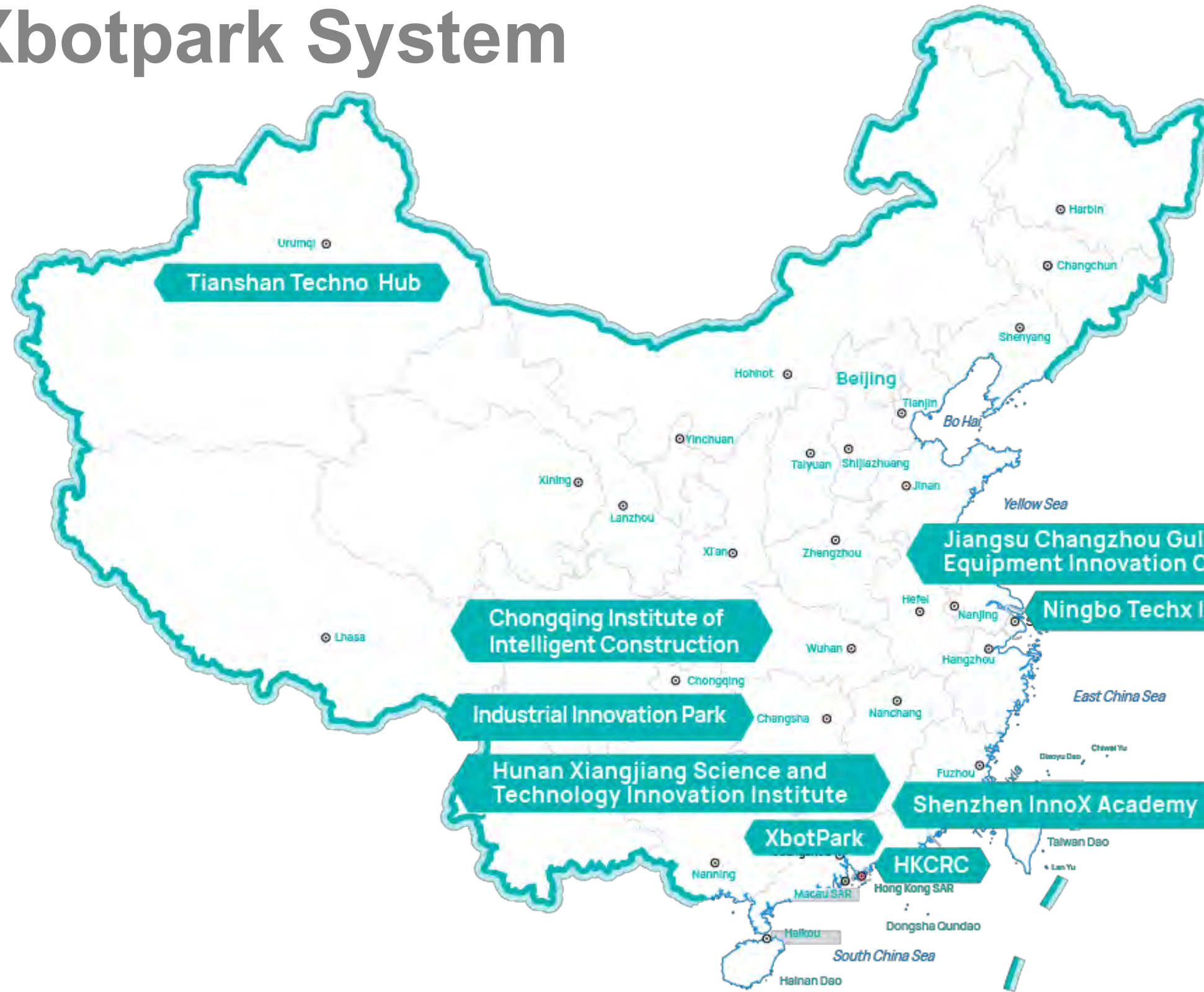
Advanced degrees from top-tier institutions worldwide

Research-Driven Innovation

Strong R&D capabilities supported by a high proportion of technical talent



Xbotpark System



Incubated
Companies
160+

Unicorn
Companies
6

Survival
Rate
80%

Tech
Companies
100%



HAIROBOTICS
海柔创新

CIDI
希迪智驾



SwitchBot



云鲸
NARWAL

LiberLive



Homern
霍曼·家庭智能



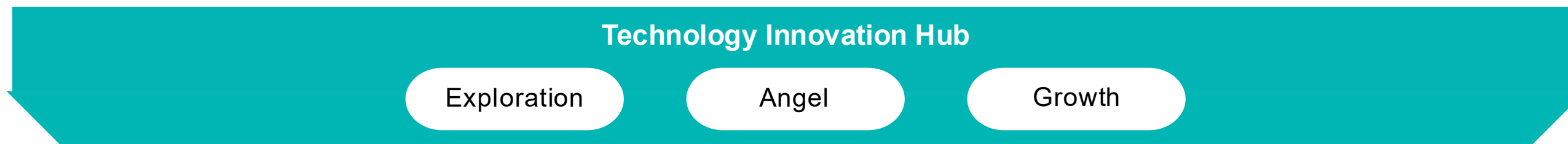
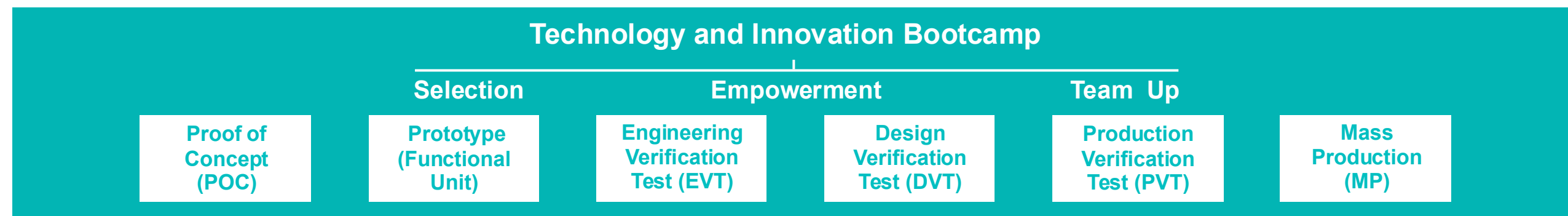
"Education, Talent, and Technology" Mechanism and System Integration Reform



Building an End-to-End Innovation Ecosystem: "1 Hub + 1 University + 1 Platform + 1 Park"



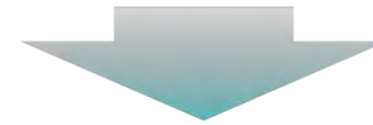
China National College Entrance Examination (Gaokao)



Business Closed Loop



Industry Resource Empowerment



- Direction and Requirements
- Market Research
- Feedback

- Testing
- Validation
- Trial Use

- Angel Customer
- Referral and Endorsement

PHASE 0

3 mos

- Market Research
- Feasibility Study

PHASE 0+

3 mos

- Team Building
- Product Definition
- Technology Assessment
- Competitive Product Analysis

PHASE A+

6-12 mos

- Team Development
- System Solution
- Technology Module
- Proof of Concept
- Second Iteration

PHASE B+

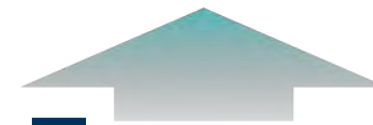
6-12 mos

- Continuous Iteration
- Engineering Verification
- Design Verification
- Field Validation

STARTUP

- Angel Customer
- Product Maturity
- Team Iteration
- Marketing Promotion
- Financing

HKCRC Empowerment



- **Methodology**
Design Thinking
User Interview
Pain Point Discovery
User Journey Map
Product Definition
- **Research Scenarios**
- **Industry Users**

- **Team Formation**
Talent Matching
- **R&D Support**
Technical Support
- **Supply Chain Support**
Shared Factory
- **Testing Site**

- **Angel Users**
Data Collection, Testing, Feedback
- **Brand Promotion**
Promotional Materials, Media Exposure
- **Marketing Promotion**
Exhibition Debut, Industry Resources

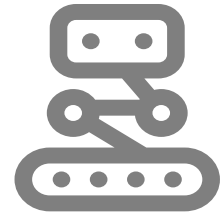
- **Company Registration**
- **Business Plan**
- **Angel Fund**
- **Financing Matchmaking**
- **Preferential Policies**



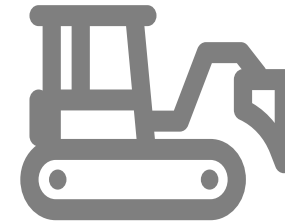
02 Products



Product



**Construction
Robots**



**Smart
Machinery**



Smart O&M

Product Portfolio

Construction Robotics

- Rebar Tying Robot RBTS1
- Construction Material Transportation Robot
- ALC Panel Installation Robot
- Deepening Design System
- Construction Inspection Robot
- Water Tank Cleaning Robot

Smart Machinery

- AI Tower Crane System
- Autonomous Solutions for Construction Machinery

Smart Operation and Maintenance

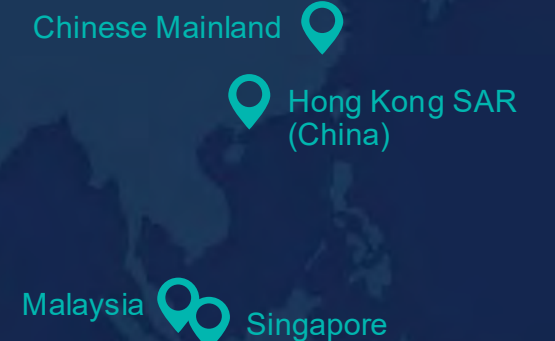
- Compact Handheld 3D Laser Scanner)
- AI Stereo Vision Measurement Device
- Close-Range AI Stereo Camera
- IoT Smart Flatness Meter
- IoT Smart Inclinator
- Drone-Based Intelligent Inspection System
- AI-Powered Home Renovation Service



USA



UAE



Chinese Mainland

Hong Kong SAR
(China)

Malaysia

Singapore

300+

PROJECTS

100+

PARTNERS

1

Exploration & Design

2

Production & Processing

3

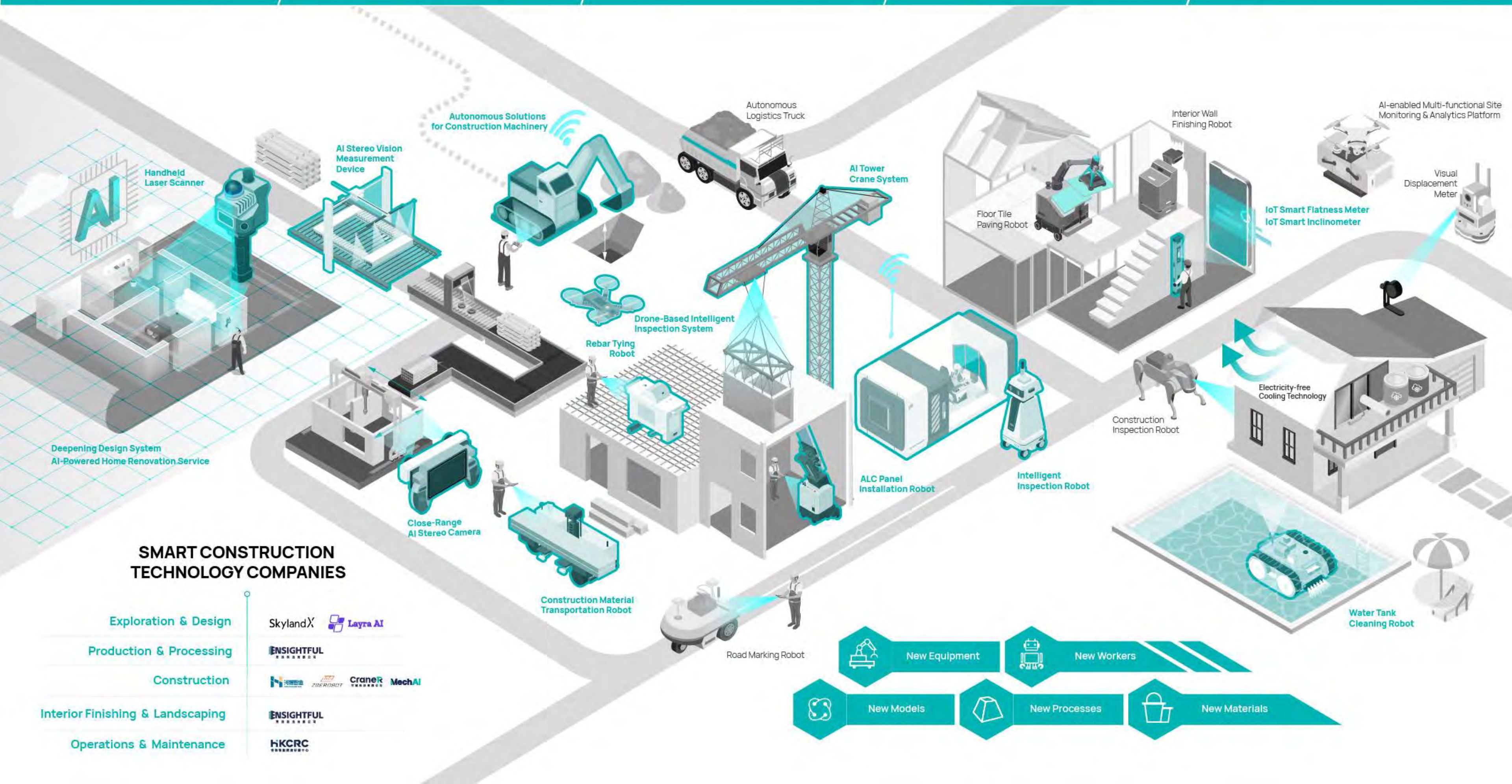
Construction

4

Renovation & Landscaping

5

Operation & Maintenance



Rebar Tying Robot RBTS1

The Rebar Tying Robot RBTS1 is specifically designed for various flat rebar-tying applications across multiple construction sectors. This robot excels in residential construction projects, infrastructure development (including roads, bridges, and tunnels), commercial complexes, medical facilities, dam construction, and industrial plants. Equipped with an autonomous recognition and positioning system, automatic obstacle avoidance, and intelligent track-switching technology, it efficiently completes large-scale rebar-tying tasks in the central areas of reinforcement grids.

Official Site
<https://www.castorobot.com/>



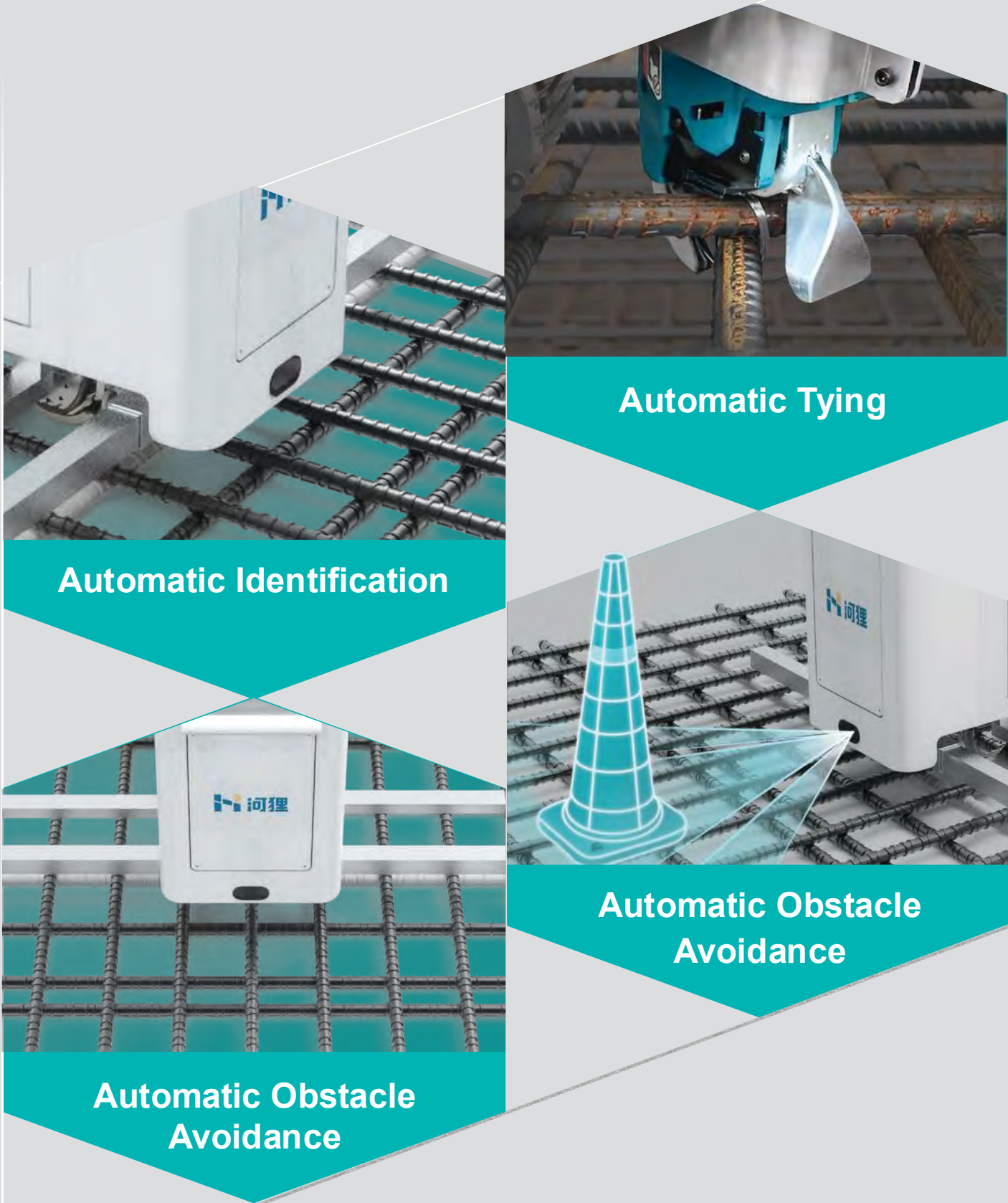
The 49th International
Exhibition of Inventions of
Geneva: Gold Medal with
Congratulations of the Jury



WEBSITE

Rebar Tying Robot RBTS1

Features



Scope of Application

- Residential Construction Projects
- Roads, Bridges, Tunnels
- High-Speed Railway Box Girder
- Precast Plants Underground Facilities
- Hydropower and Water Conservancy Engineering
- Marine / Offshore Engineering
- Grain Storage Structure Construction

Product Parameters

Weight	39kg	Battery Life	8h
Size	730*330(800)*570mm	Adapted Rebar Spacing	100-300mm
Efficiency	500 nodes/h	Adapted Rebar Size	6-32mm

Application



Construction Material Transportation Robot

Developed by ZOEROBOT, an HKCRC-incubated company, the Construction Material Transportation Robot enables horizontal transfer of building components and supports vertical transportation via construction elevators, offering intelligent solutions that reduce labor intensity and improve operational flexibility.

Official Site <https://www.zoerobot.com/>

Features



Obstacle Crossing



Wi-Fi Remote Control



Integrated Safety Protections

Product Parameters

Weight	1200kg
Size	1600*1200*1800 mm
Maximum Load	600 kg
Applicable wall panle sizes	3-6(m)
Battery Life	8h



WEBSITE

ALC Panel Installation Robot

The ALC Panel Installation Robot handles multi-hundred-kilogram panels through intelligent pickup, positioning, and alignment processes, enabling single-operator installation of 3-6m prefabricated interior walls with minimized crew requirements and a 60% streamlined workflow.

Official Site <https://www.zoerobot.com/>

Features



Automatic Grabbing



Wi-Fi Remote Control



Flexible and Stable

Product Parameters

Weight	880kg
Size	880*989*1360mm
Maximum Load	300 kg
Applicable wall panle sizes	2-3.2(m)
Battery Life	8h



WEBSITE

Deepening Design System

The Deepening Design System is capable of automatically performing tasks such as CAD drawing recognition, structural information analysis, detailed drawing generation, lightweight 3D model creation, production data import, and construction plan generation. Compared to traditional manual detailing, this system significantly improves design efficiency and precision through its independently developed intelligent algorithm.

Features



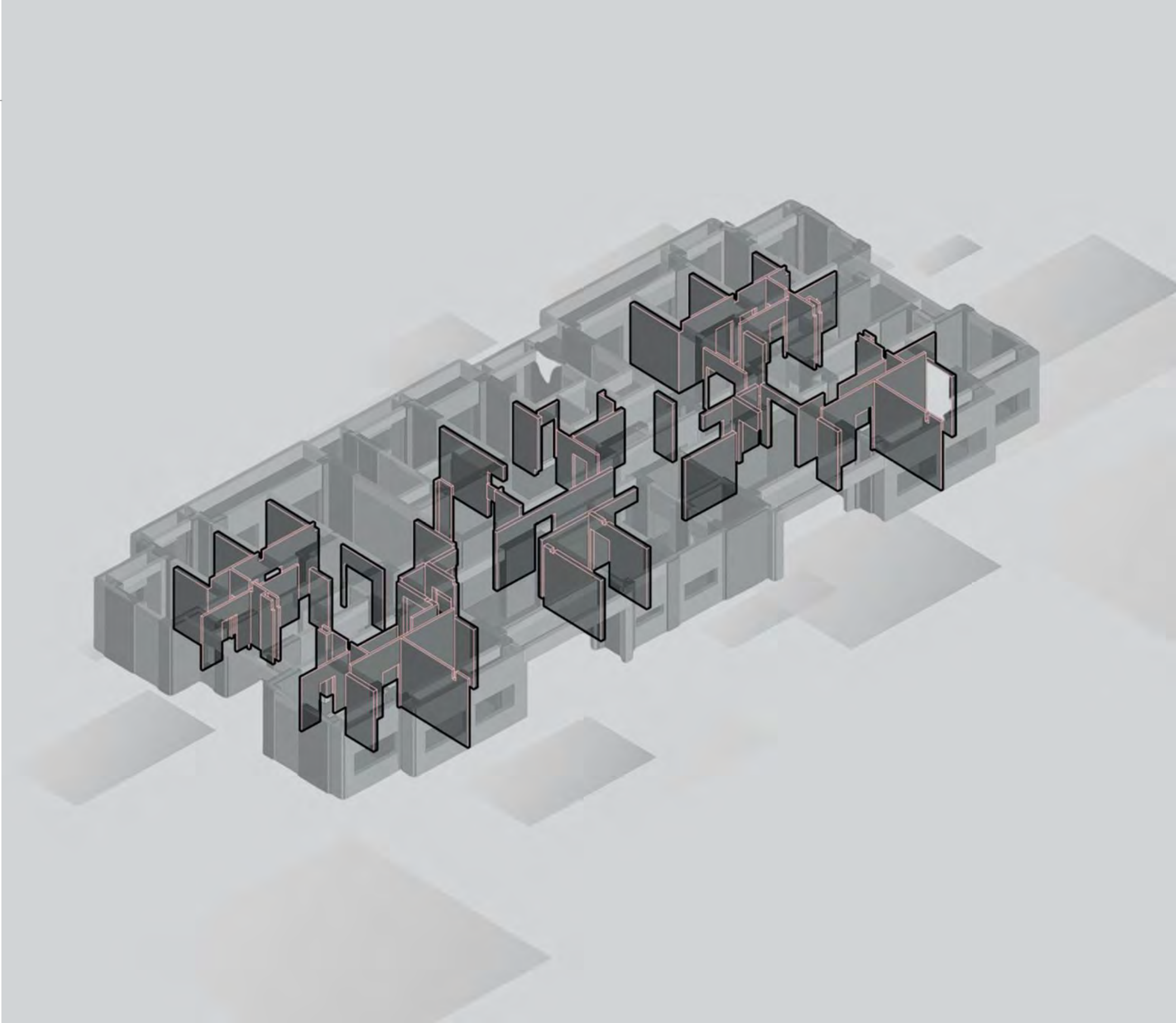
Design, segmentation, drawing, and quantity takeoff for every 1,000 wall panels takes only 5 minutes.



Drawing recognition accuracy exceeds 99%.



Simultaneous output of floor plans, elevation views, quantity takeoff lists, 3D models, and construction planning.



Construction Inspection Robot

The Construction Inspection Robot is an advanced, AI-powered solution designed to enhance the inspection and verification processes in modern building environments. Equipped with intelligent detection capabilities, the robot autonomously identifies and assesses building services (BS), and indoor air quality (IAQ).

Functions

- ◆ AI-Powered Detection
- ◆ Indoor Air Quality (IAQ) Monitoring
- ◆ Tablet-Controlled Task Assignment
- ◆ Autonomous Navigation
- ◆ Remote Control Capability
- ◆ Automatic Obstacle Avoidance
- ◆ Slope Climbing Ability (up to 10°)
- ◆ 3D Point Cloud Reconstruction
- ◆ IAQ Reports and Building Services Reports



Water Tank Cleaning Robot

The Water Tank Cleaning Robot is specifically designed for cleaning water storage tank, it replaces workers who would enter confined spaces to perform cleaning tasks. The robot features AI for contamination detection, autonomous navigation, brushing, suction, high-pressure rinsing, and disinfection. It enhances occupational safety and health level, reduces manpower, costs, and improves operational efficiency.

Functions

- Cleaning Function
- Dirt Suction Function
- Spraying Function
- Obstacle Avoidance Function
- Monitoring Function
- Dirt identification & Work Recording
- Return to Start Point
- Lighting Function
- Robot status display
- Parameter Settings
- Remote control mode
- Automatic Mode



The 51th International Exhibition of Inventions of Geneva:

Gold Medal



AI Tower Crane System

The AI Tower Crane System can be applied in various fields such as construction, ports, logistics, and industrial manufacturing. It features core functionalities such as remote control lifting, AI stable hook, AI-based safety monitoring, and AI-assisted route planning. By integrating embodied intelligence and artificial intelligence technologies, it constructs a comprehensive environmental perception and autonomous decision-making system, achieving a breakthrough upgrade in Tower Crane operations.

Reports on related News



The 49th International
Exhibition of Inventions of
Geneva: Gold Medal

CIC Innovation Award 2025
the Second Prize in the
"Local Construction Safety"
category



Advantages



Operational
Safety



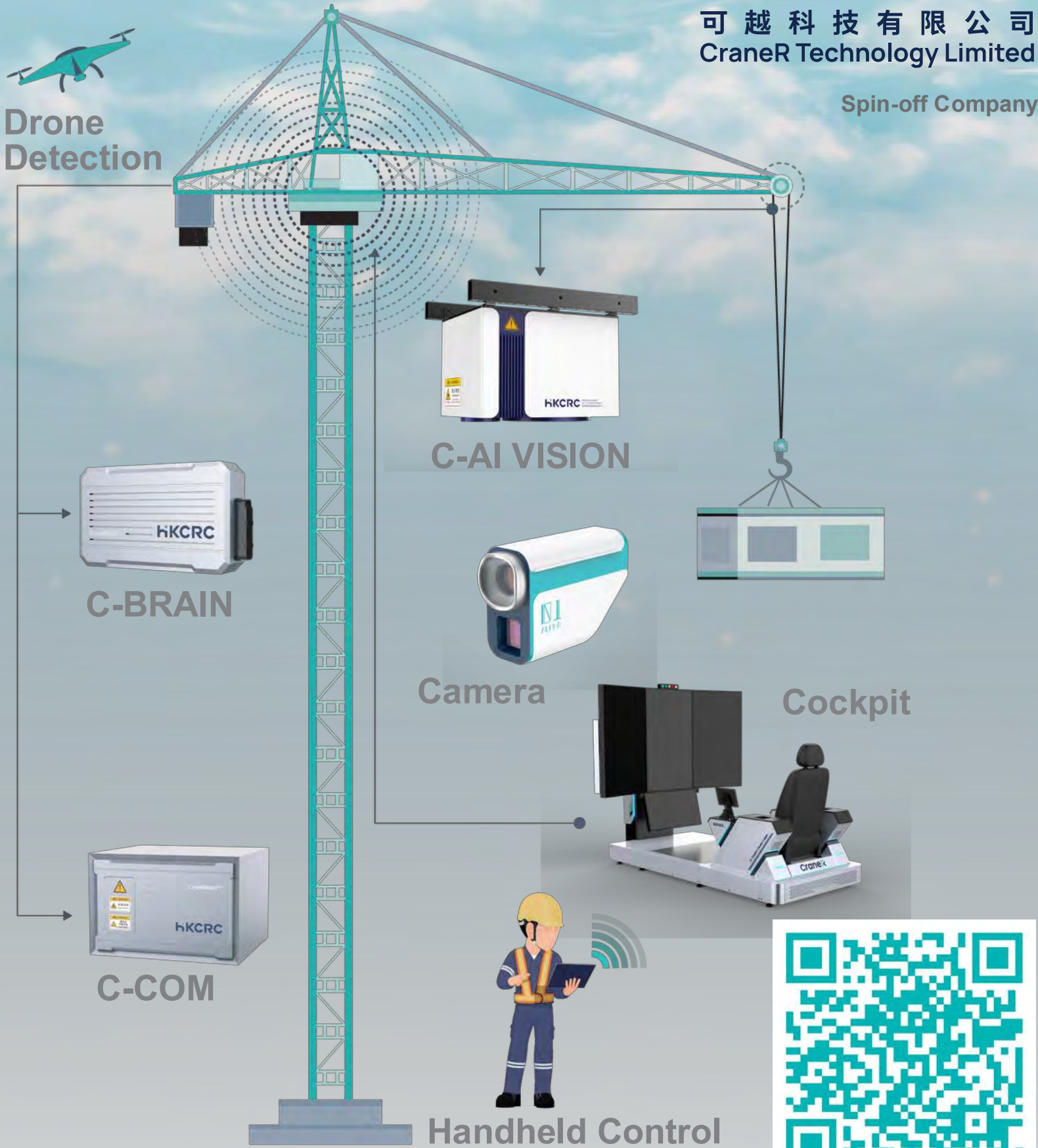
Labor
Optimization



Efficiency
Improvement



Smart Data
Management



CraneR

可越科技有限公司
CraneR Technology Limited

Spin-off Company



WEBSITE

AI Tower Crane System



Remote Cockpit

Operating Device



CMP (Central Management Platform)

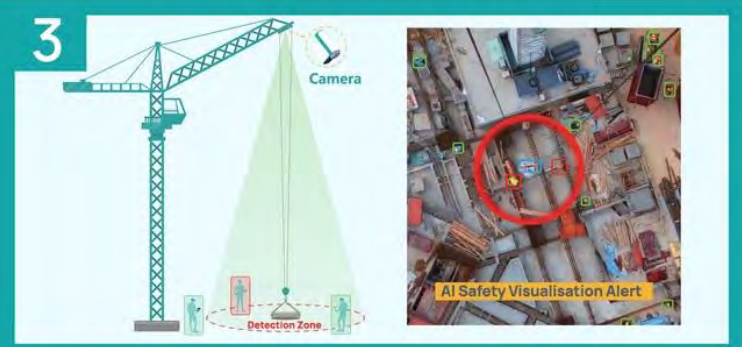
Functions



Remote Control Lifting



AI Stable Hook



AI-based Safety Monitoring



AI-assisted Route Planning

Application Cases



Public Housing Developments at Anderson Road Quarry Sites R2-6 and R2-7



Public Housing Redevelopment at Pak Tin Estate Phase 13



Construction of Public Housing Development at Tung Chung Area 42

Autonomous Solutions for Construction Machinery

MechAI's mission is to transform traditional construction machinery into Intelligent Unmanned Systems, addressing critical challenges in mining, civil engineering, and related industries.

1. Remote Control

Quickly transforms construction machinery into a remotely controllable unit, equipped with a sophisticated video transmission system that allows operators to understand the site conditions in real-time, ensuring safe and efficient operation.

2. Autonomous Driving

The intelligent controller can receive commands from operators and interact using schematics to automatically complete designated tasks, significantly enhancing work efficiency and reducing human errors.

3. Guidance System

MechAI's guidance system assists operators in accurately understanding the current position, state, and excavation depth, enabling them to precisely complete their tasks and improve operation accuracy.



Autonomous Solutions for Construction Machinery

Scope of Application



Hazardous Zone Operations



Mining



Construction



Emergency Rescue

Metacam Air

The Metacam Air is a compact handheld 3D laser scanner developed by Skyland Innovation, an HKCRC-incubated company. The device seamlessly integrates two high-resolution color cameras, 360°Lidar and RTK. It delivers real-time preview and generation of centimeter-level precision color point clouds, enhancing scanning efficiency. Engineered with an aircraft-grade aluminum shell and a Magsafe design, Metacam Air guarantees heightened stability and convenience during operation.

Features



High Integration
(Weighing only 680g)



Scanning like
capturing a 3D video



Exquisite design for
efficient capture



User-friendly
interaction and
convenient operation

Applications



WEBSITE

Metacam Air

Point Cloud Visualization



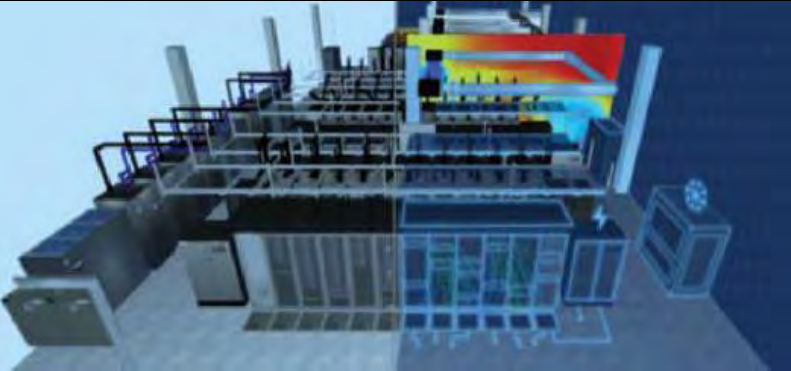
Scope of Application



Geo-information surveying and mapping



Architectural engineering and construction (AEC)



Digital twins



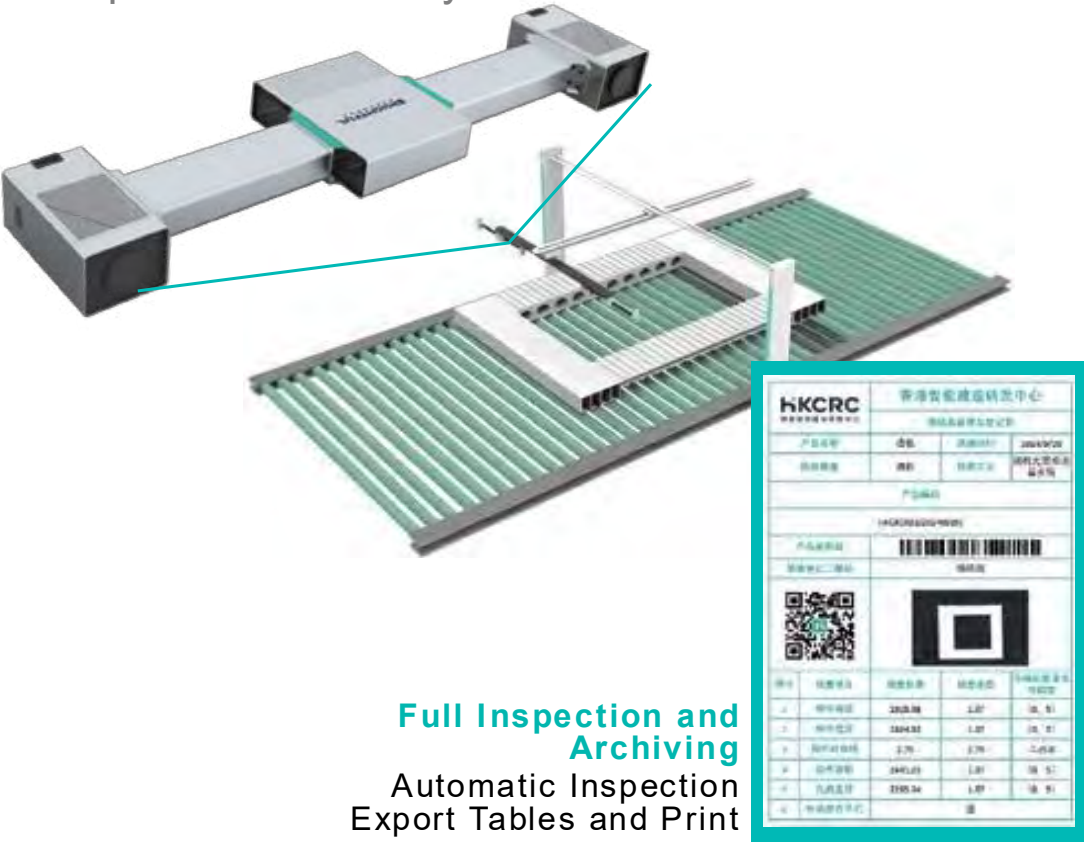
Virtual tourism and entertainment

Product Parameters

Weight	680g(Without battery) 1010g(With battery)
Size	298*105*104mm (With battery) 133*105*104mm (Main Scanner)
Battery Capacity	3150mAh
RTK Accuracy	Flat 0.8cm+1ppm
Elevation	1.5cm+1ppm
Point Cloud Format	.las
Point Cloud Density	200,000/s

AI Stereo Vision Measurement Device

The AI Stereo Vision Measurement Device is a high-precision device designed specifically for modular construction (MiC) factories. Through advanced stereo visual inspection technology and multi-sensor fusion, it automatically identifies the object under inspection and swiftly detects critical parameters such as flatness, parallelism, and dimensional deviations with exceptional accuracy.



The image shows a 3D rendering of the AI Stereo Vision Measurement Device, which is a white, L-shaped structure with a green frame. It is positioned over a large, rectangular, perforated metal plate. The device's camera and sensor unit is mounted on a track that can move along the length of the plate. The device is shown in two positions: one where it is moving and another where it is stationary, with a green laser line indicating the measurement area. Below the device, a small inset image shows a QR code and a table of inspection results.

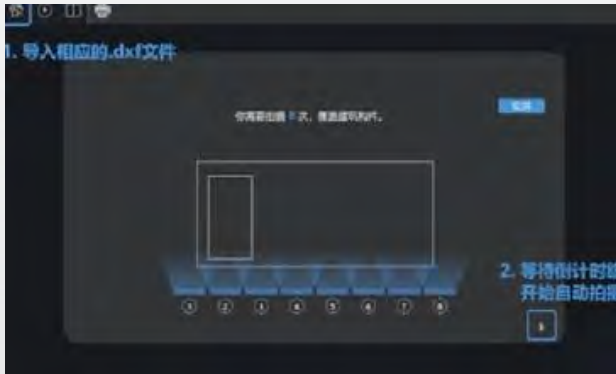
Full Inspection and Archiving
Automatic Inspection
Export Tables and Print

HKCRC 香港智能建造研发中心				
智能建造研发记录表				
产品名称	规格	测量日期	2024/05/28	
检测项目	检测	检测工具	智能建造系统	
产品名称				
14620000000000000000				
产品名称				
智能建造系统				
检测日期				
检测地点				
序号	检测项目	检测数据	检测结果	检测备注
1	检测项目	2024/05/28	1.00	OK, 51
2	检测项目	2024/05/28	1.00	OK, 51
3	检测项目	2.75	2.75	OK, 51
4	检测项目	2024/05/28	1.00	OK, 51
5	检测项目	2024/05/28	1.00	OK, 51
6	检测项目	2024/05/28	1.00	OK, 51

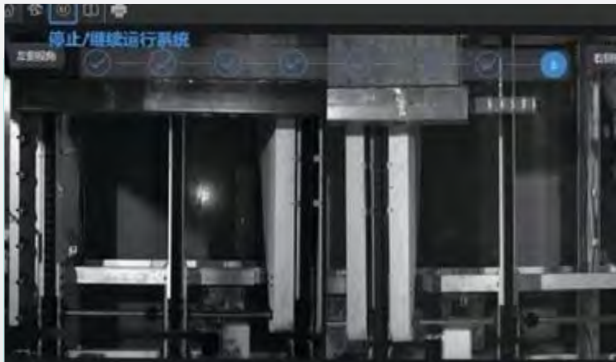


AI Stereo Vision Measurement Device

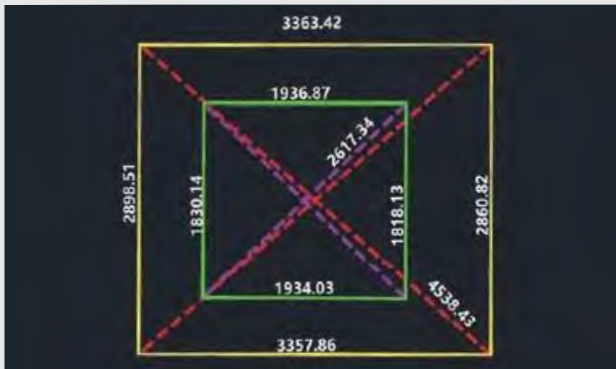
Usage Process



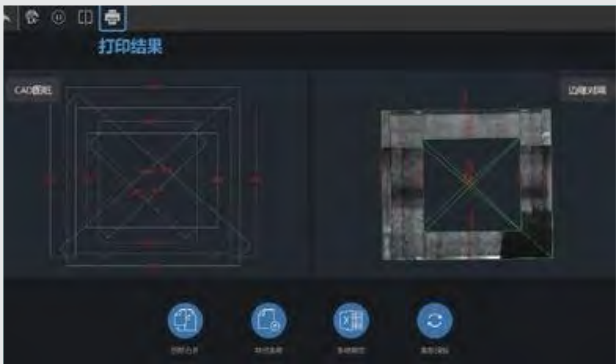
1 Import Data



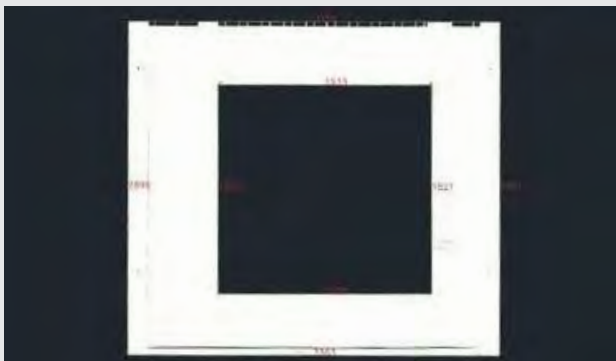
2 Automatic Capture



3 Automatic Recognition



4 CAD Comparison

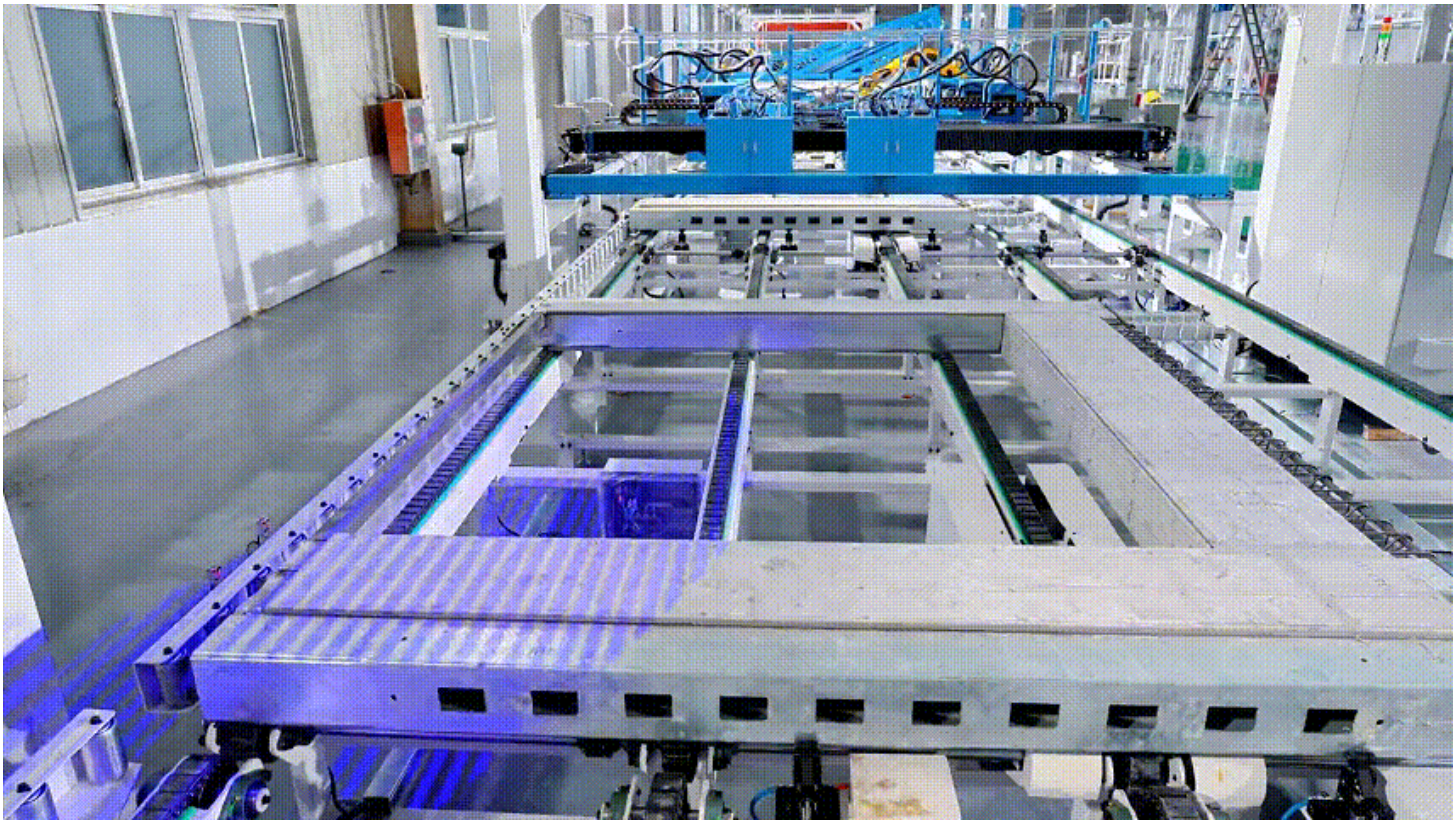


5 Automatic Inspection

序号	检查项目	检查结果	检查差值	合格标准及允许偏差
1	构件高度	1929.58	1.37	(0, 5)
2	构件宽度	1824.83	1.37	(0, 5)
3	构件对角线	2.79	2.79	$\Delta \leq 5.0$
4	构件面积	2441.23	1.37	(0, 5)
5	孔洞直径	2295.24	1.37	(0, 5)
6	外墙是否平行	是		

6 Print Results

Application



Product Parameters

Measuring Length (Single Device)	0-4.5m	Working Capture Distance	4m
Measurement Accuracy	$\pm 2\text{mm}$	Lateral Resolution (at 4m Working Distance)	0.7mm
Product Weight	4.6kg	Product Dimensions	1000*1600*90mm

Close-Range AI Stereo Camera

The Close-Range AI Stereo Camera, a high-precision visual device optimized for handheld operation. Featuring a lightweight design, it integrates compact-baseline stereo vision and edge AI technology, condensing the detection capabilities of a professional laboratory into the palm of your hand. It delivers effortless, high-precision measurements directly on the factory floor or construction site.



Front



Back



IoT Smart Flatness Meter

The IoT Smart Flatness Meter has the function of measuring flatness, levelness and verticality. Through multi-sensor fusion technology, it measures flatness with high efficiency and high precision. With APP data management system, it can record data and export tables with one click, and the whole process does not require handwriting.



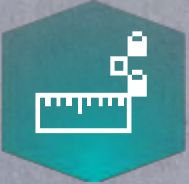
red dot
Red Dot Award:
Design Concept



ENSIGHTFUL
見地科技有限公司

Spin-off Company

Features



Flatness, Levelness, and Verticality in Single Measurement



No Feeler Gauge Required Efficiency Improved by 55%

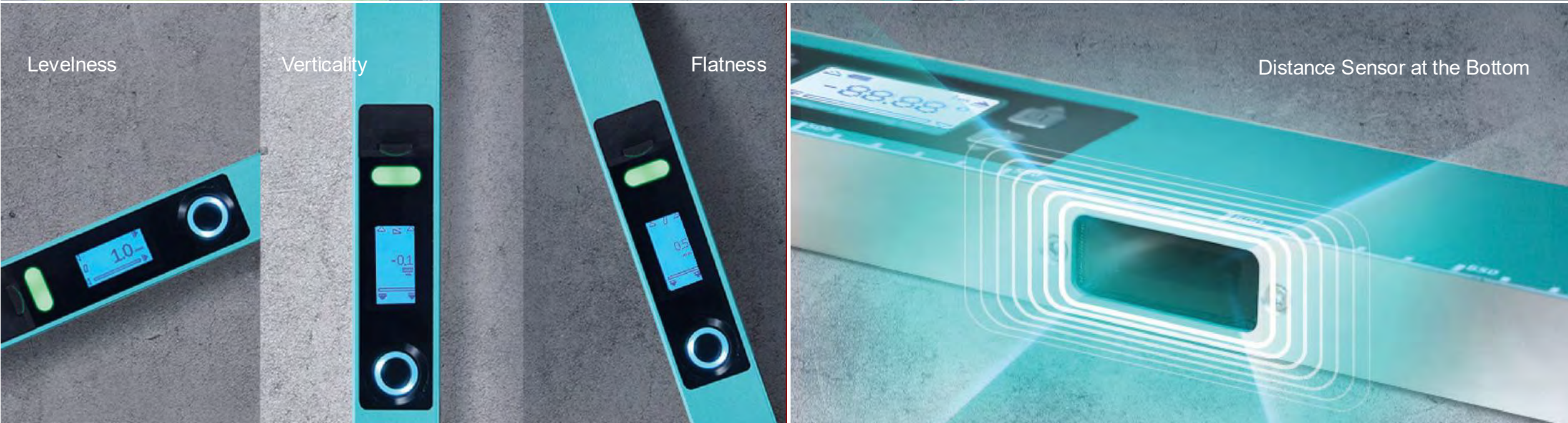


Hands-free Note Taking



5,200 times Measurement when fully charged

APP data management



Levelness

Verticality

Flatness

Distance Sensor at the Bottom

IoT Smart Inclinometer

Through self-developed algorithms, IoT Smart Inclinometer can measure the angle and slope. It has dual sided digital screen. Cooperating with the APP data management system, you can record data and export tables quickly, and handwriting is not required.



Features



Read Data
Conveniently with
Digital Screen



Hands-free Note
Taking Recording



5,200 times
Measurement When
Fully Charged



APP data
management

Drone-Based Intelligent Inspection System

The Drone-Based Intelligent Inspection System enables efficient and accurate detection of facade defects. Equipped with high-resolution visual modules and AI recognition algorithms, the system automatically identifies cracks, water leakage, and hollowing, significantly reducing manual labor while enhancing inspection efficiency and safety. It is ideal for high-rise buildings, aging residential blocks, and complex curtain walls—paving the way for digital and intelligent building maintenance.

Features



High Accuracy

Utilizes AI-powered recognition to accurately detect



Enhanced Safety

Minimizes the need for manual inspection at heights



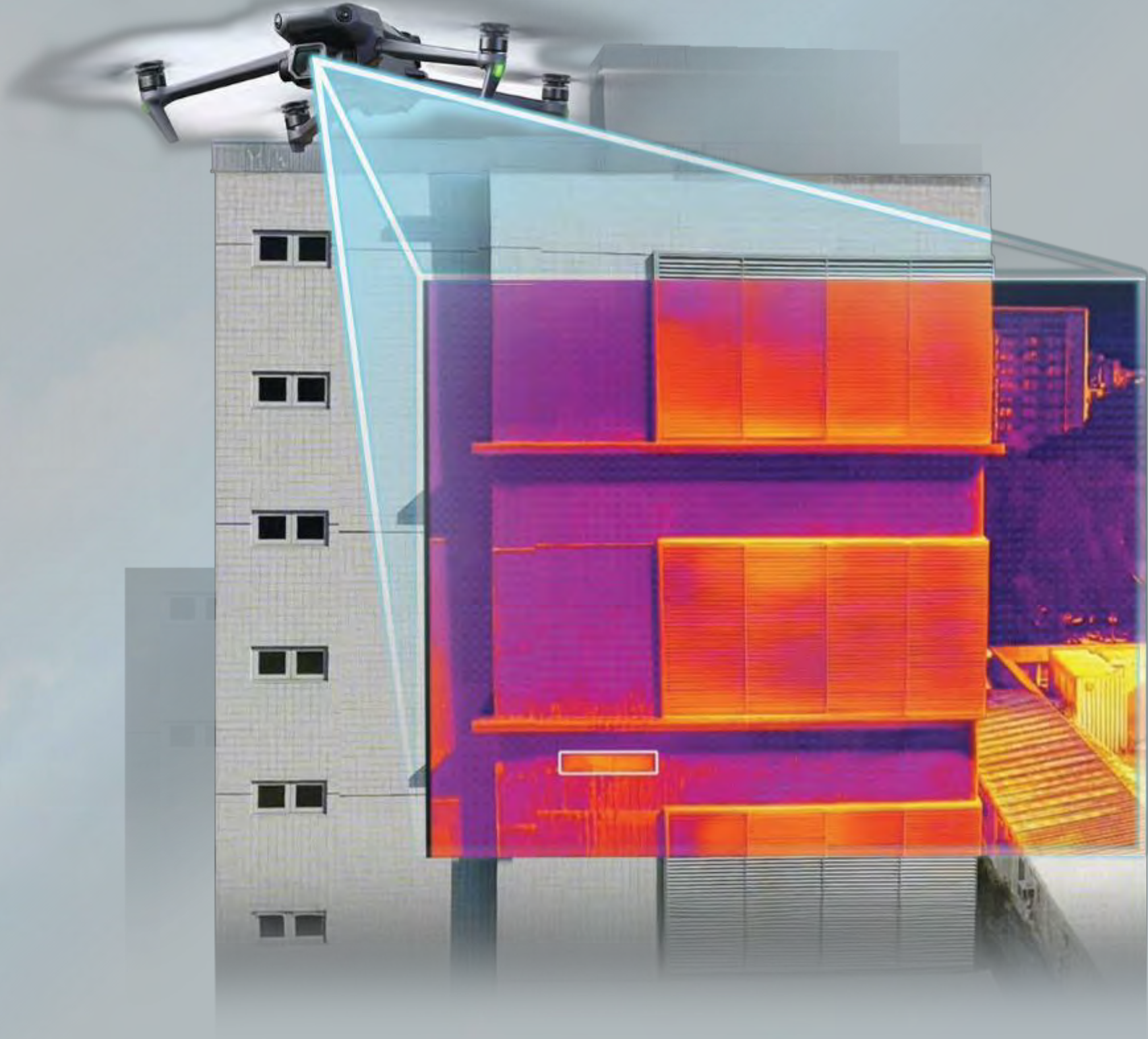
Operational Efficiency

Automates the inspection process



Wide Applicability

Adaptable to various building types



Layra AI

Layra is an all-in-one AI-powered home renovation service that covers every stage from design to construction. Leveraging generative AI technology, Layra delivers modular home solutions with fully automated workflows. This approach ensures more personalized interior designs, easier future modifications, and a more environmentally friendly process overall.

Official Site [Layra AI - Leading AI Interior Design Platform](#)

Features



AI-optimized Layout Furniture arrangement boosts perceived space by 50%



Rule-based AI Algorithm Generates multiple plans in 30 seconds



Modular Design Replacement for maintenance or style updates



Dry Construction Assembly reduces cutting, waste, noise, and dust



Process

- Request & Solution:** AI-powered, instant solutions; one-click quote generation.
- Production & Inspection:** Standardized factory production; modular products for precision and durability.
- On-site Installation:** Dry construction with quick assembly, minimizing noise and dust pollution



WEBSITE

Modes of Collaboration & Partners



Technology Licensing

- Intellectual property and patent licensing
- Technology Transfer



Customized Development

- On-demand solution design and development
- Design-to-Delivery Project Support



Collaborative Research Projects

- Cross-Country and Regional Cooperation ? in University Research Projects
- Data Analysis and Experimental Validation



Training and Consulting

- New engineering education and training
- Technology Innovation Bootcamp cooperation



Housing Bureau
The Government of the
Hong Kong Special Administrative Region
of the People's Republic of China



建築署
Architectural Services
Department

機電工程署
EMSD



CONSTRUCTION
INDUSTRY COUNCIL
建造業議會



香港科技大學
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

UC Berkeley



中國建築國際集團有限公司
CHINA STATE CONSTRUCTION INTERNATIONAL HOLDINGS LIMITED
(於開曼群島註冊成立之有限公司)
(Incorporated in the Cayman Islands with limited liability)



華營建築有限公司
CR CONSTRUCTION COMPANY LIMITED
浙建集團



瑞安建業
SOCAM DEVELOPMENT



上海浦东发展〔集团〕有限公司
SHANGHAI PUDONG DEVELOPMENT (GROUP) CO.,LTD.



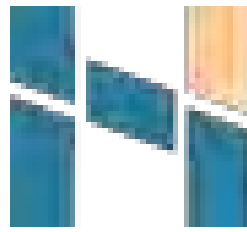
新鴻基地產
Sun Hung Kai Properties

vanke 万科

Spin-off Companies

SkylandX

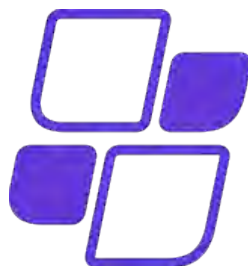

Z0EROBOT

 **河狸智造**
Castor Construction Robotics

ENSIGHTFUL
覓地科技有限公司

CraneR
可越科技有限公司

MechAI

 **Layra AI**

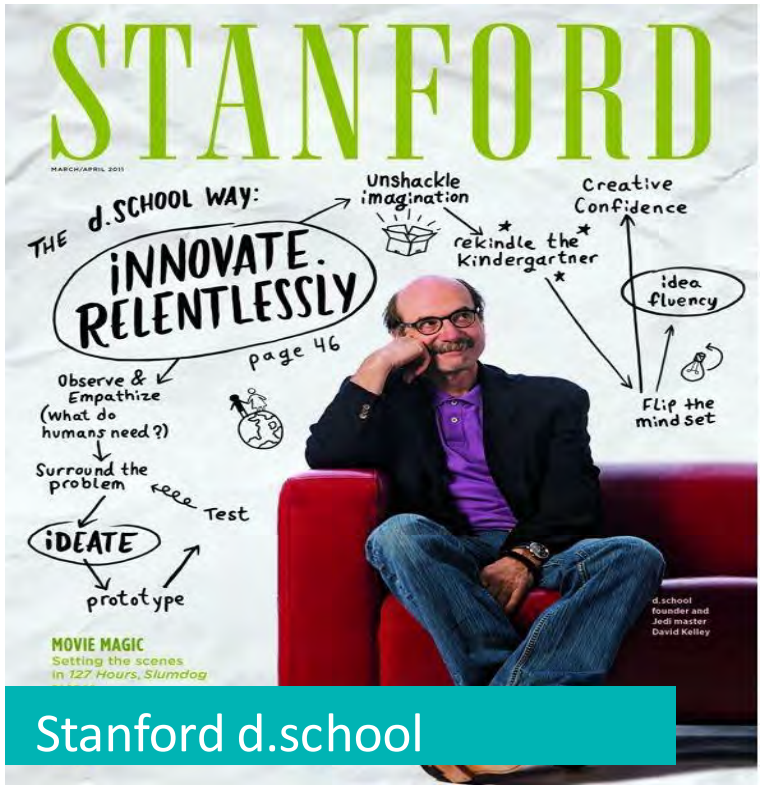
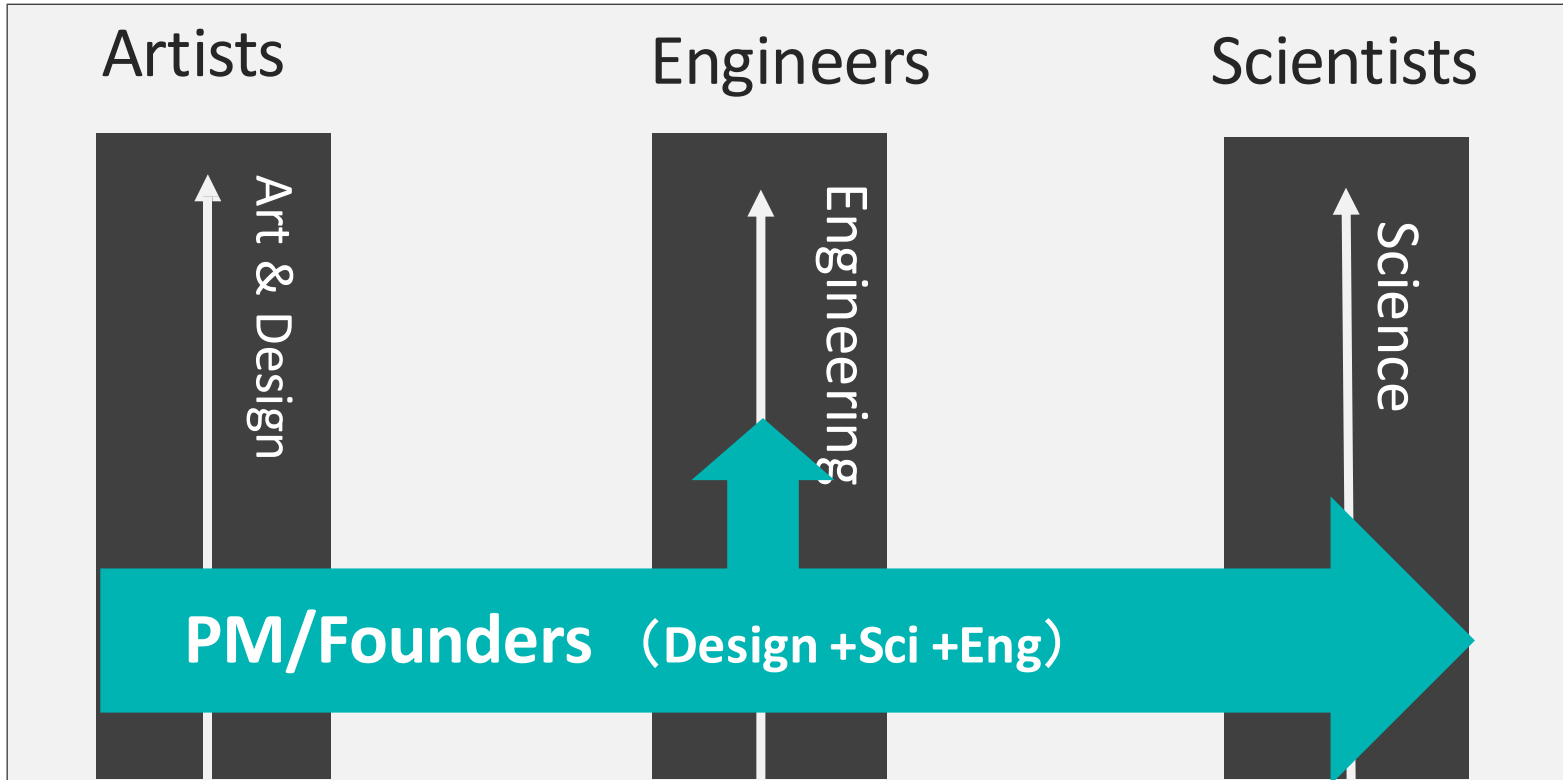
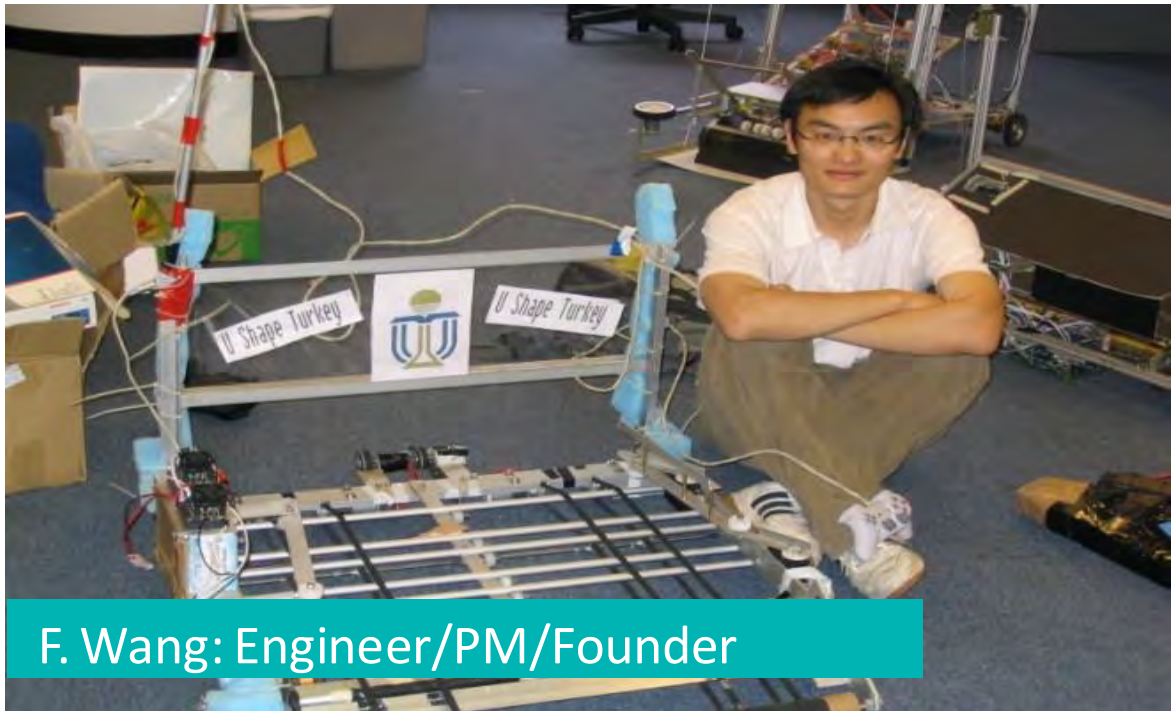
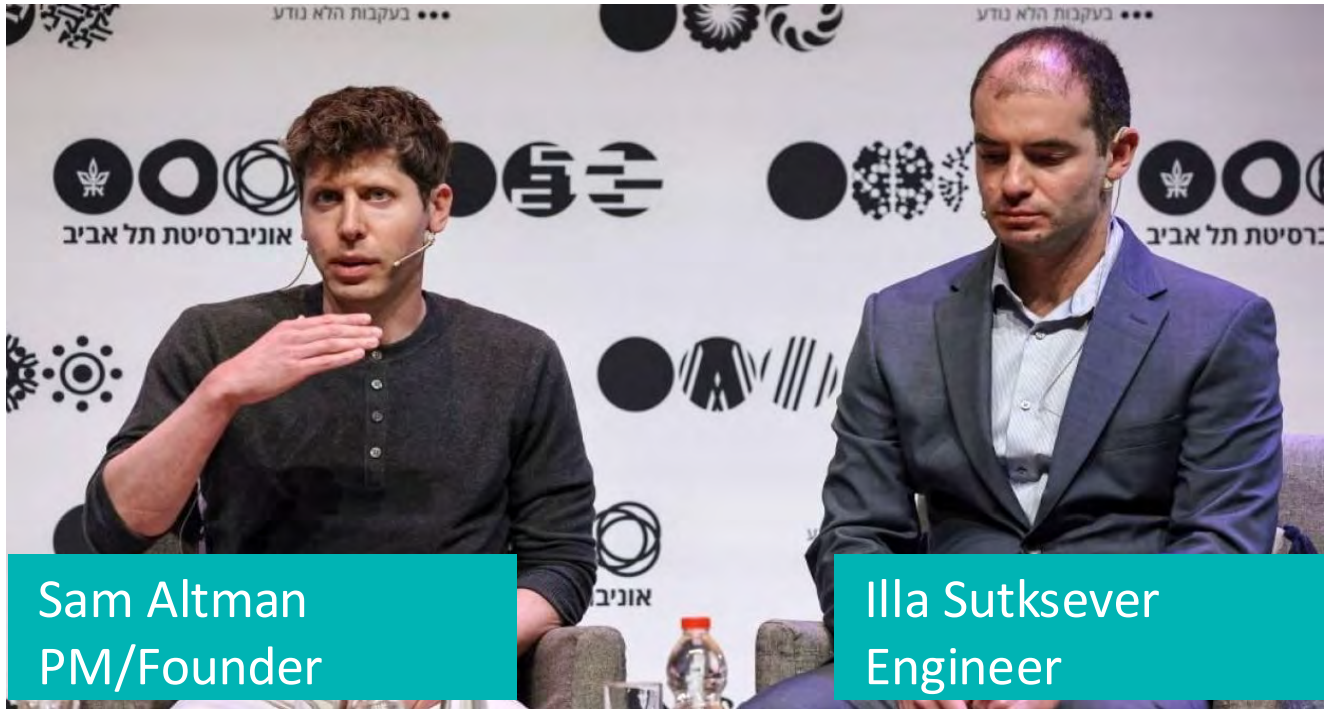
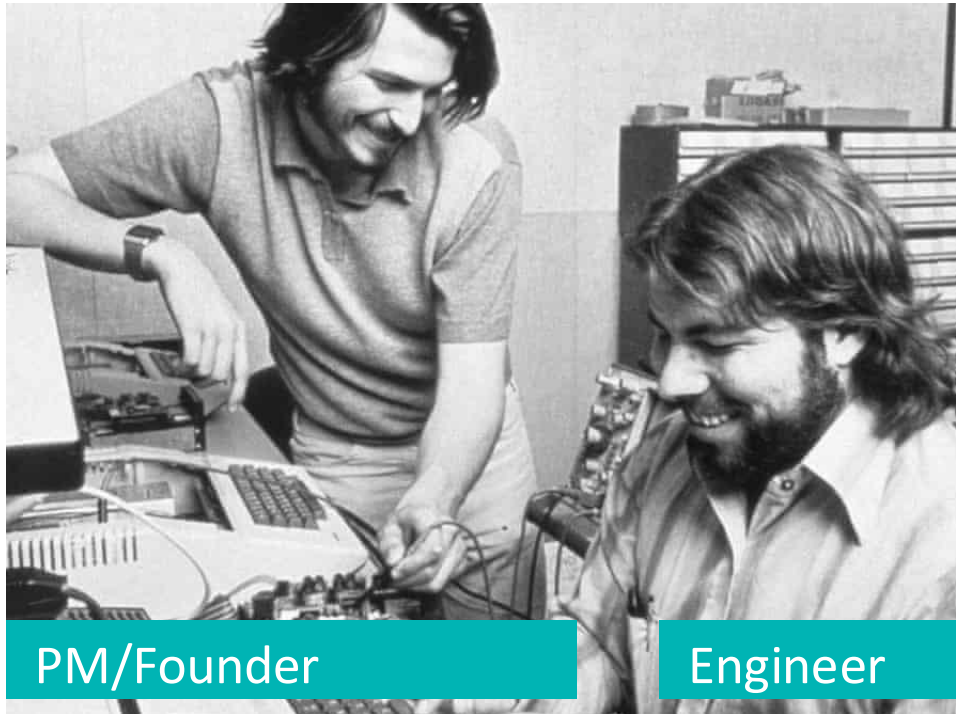


03 Education



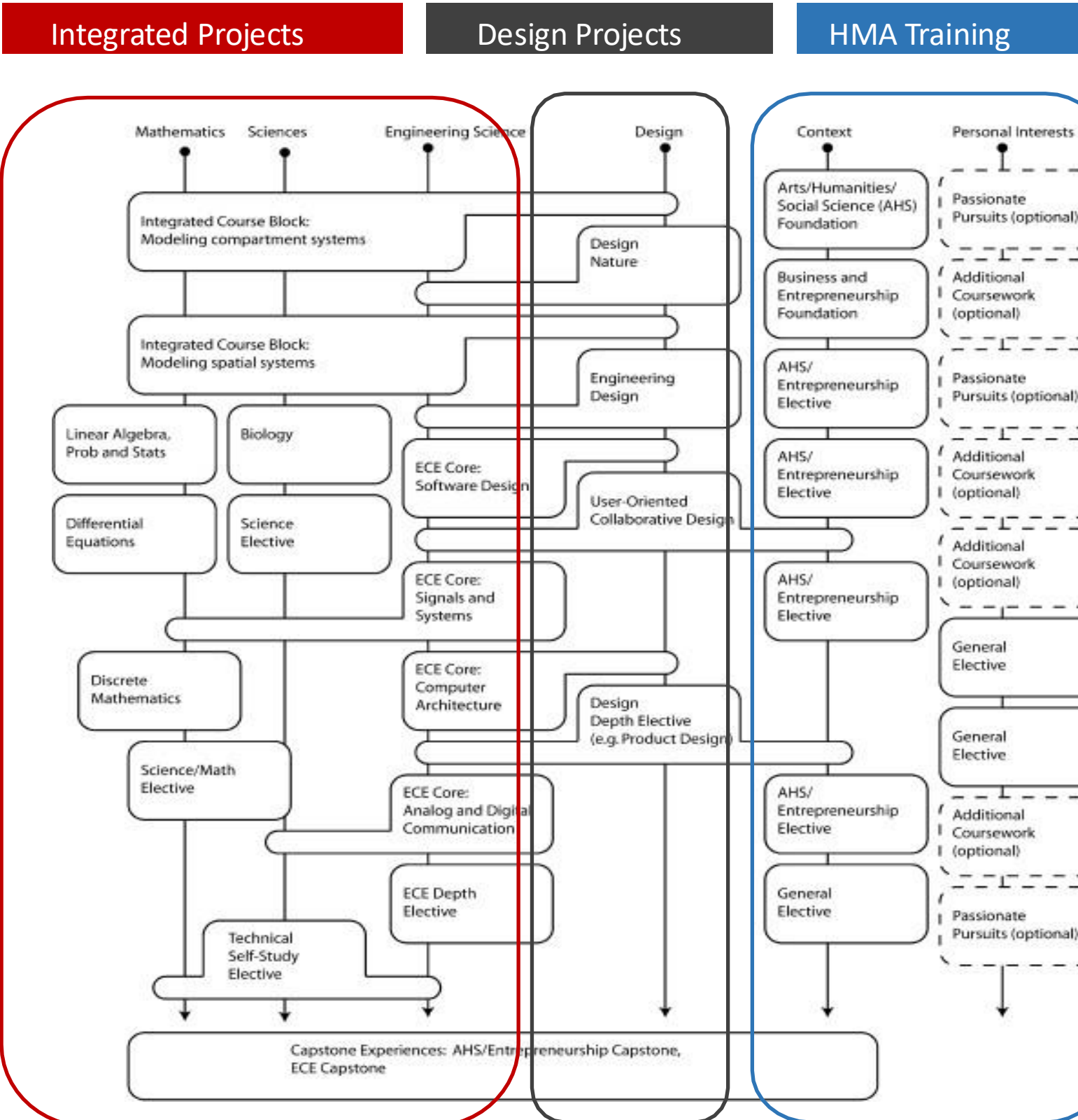
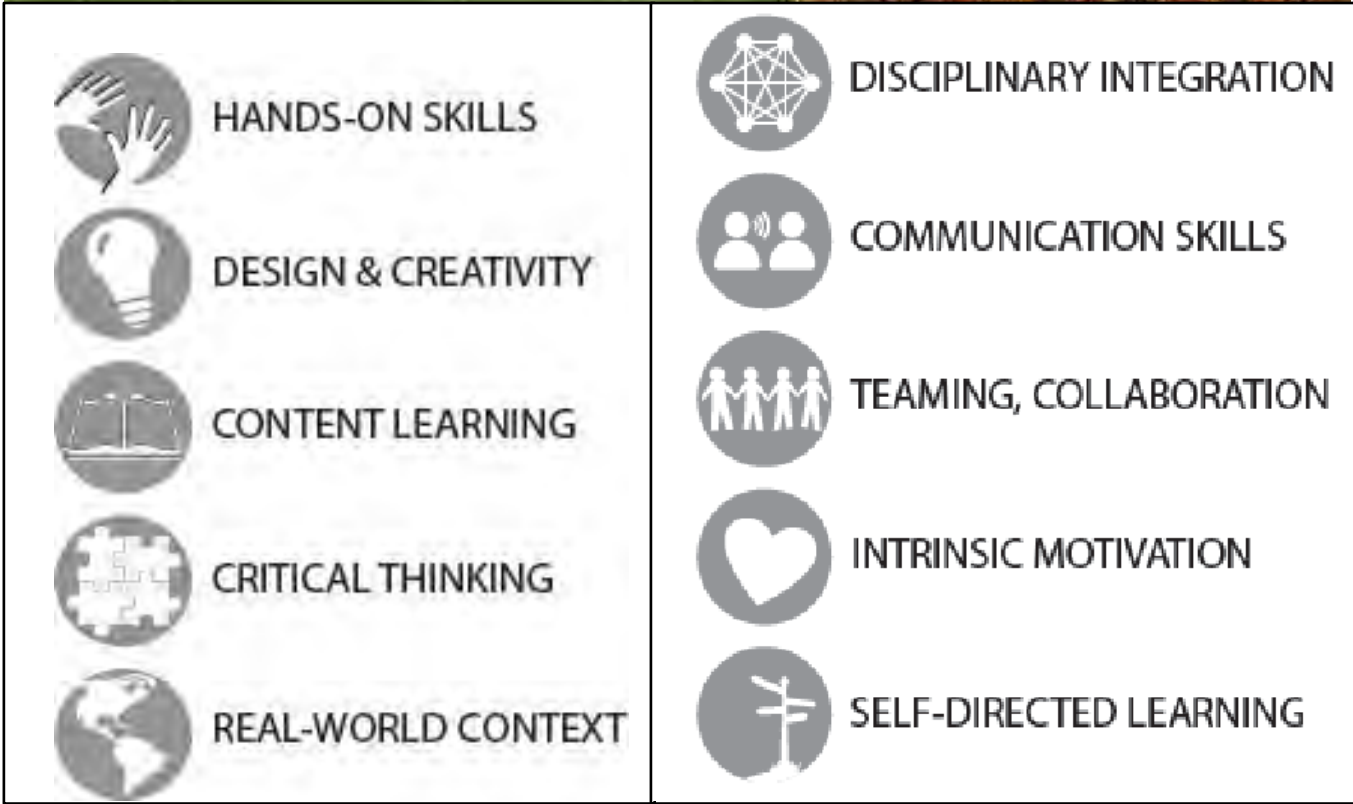
New Engineering Education

New Engineering Education: From Excellent Engineer to Product Manager/Entrepreneur

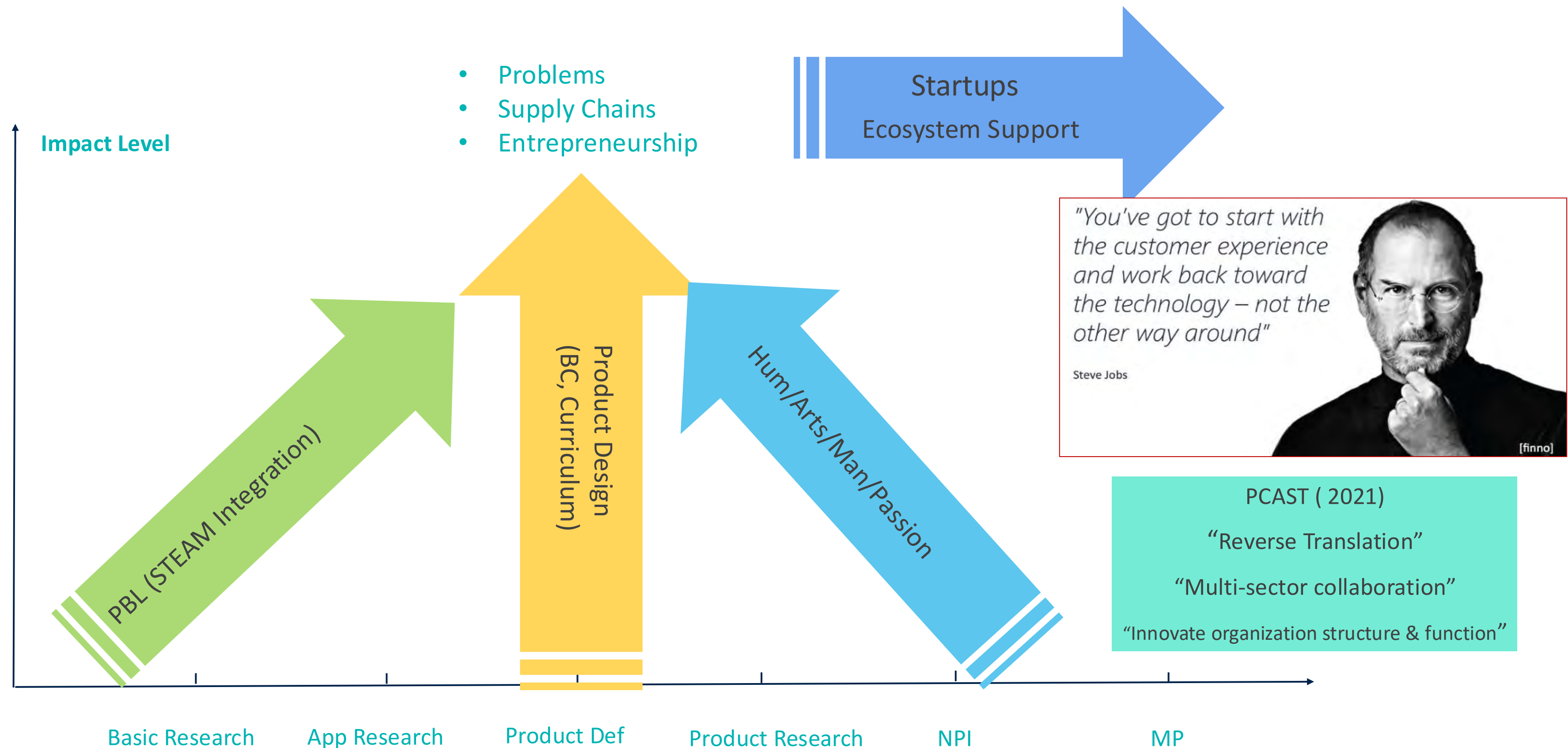


New Engineering Education

Olin College of Engineering (Ma, USA)



New Engineering Education

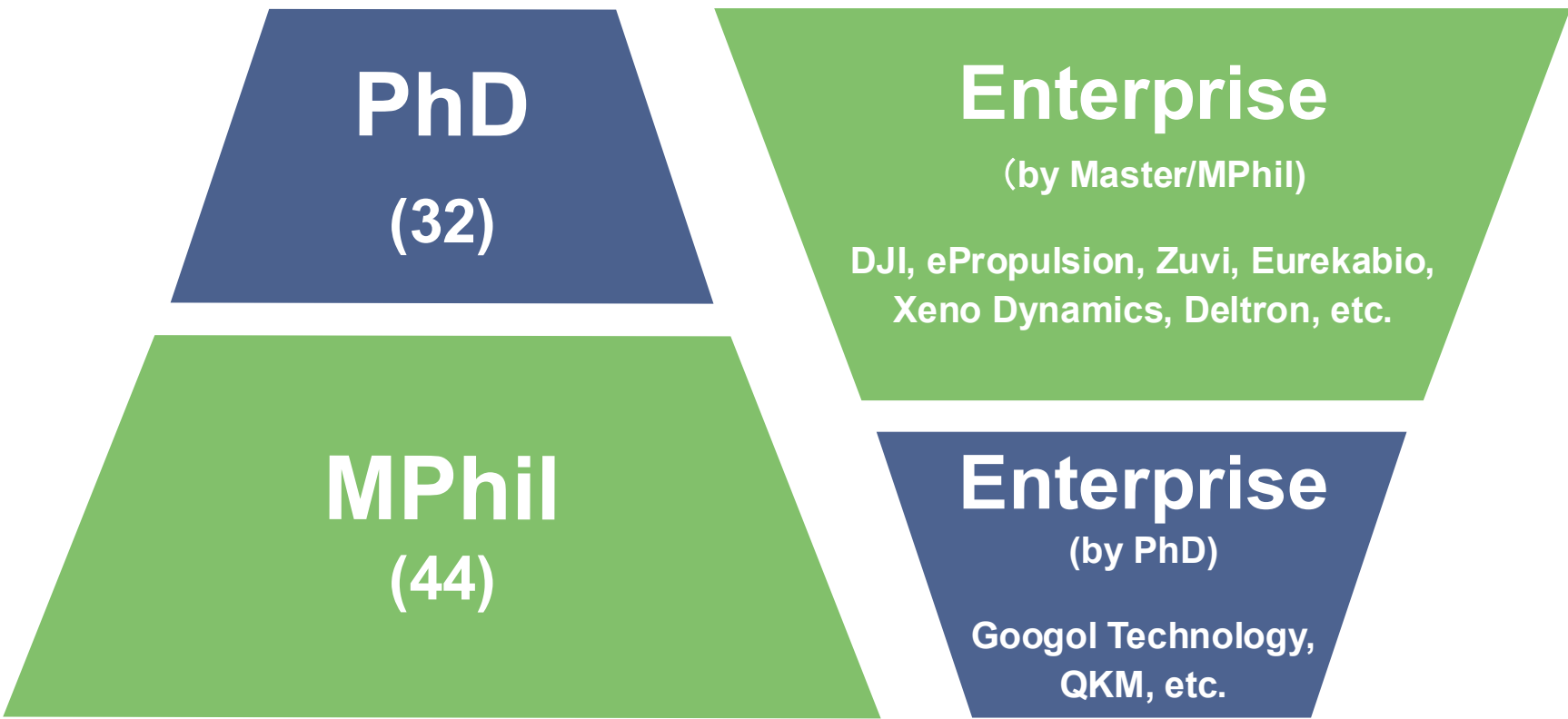


New Engineering Education

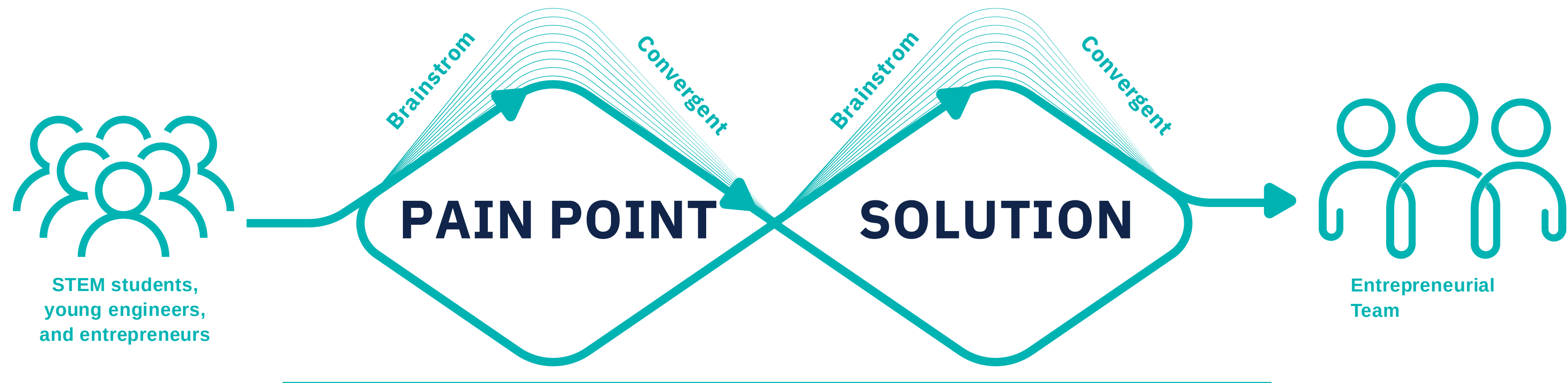
HKUST ATC 1992-2021 (3126 Laboratory)

Degree	Number of People
MPhil	44
PhD	32
Postdoc	6
Research Assistant	5
Visiting Scholars	17

Occupation	Number of People
Work	38
Entrepreneurship	37
Academic	31
Studying	5
Starting a company	28



Innovation Camp

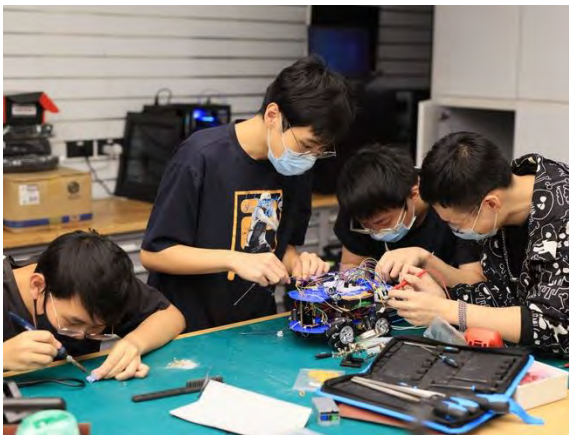


Pre-camp Research, Team
Formation, Product Testing,
Industry Sharing

Desk Research, Field
Research, User Interviews,
equirements Analysis

Solution Ideation, Technology
Integration, Mass Production
Research, Prototyping, Industry
Sharing

Previous Events Highlights



Innovation Camp

Core Features

Immersive Venture-Building

2-6 weeks for cross-disciplinary teams to tackle the full innovation

Interdisciplinary Collaboration

Teams of 4–5 members with diverse backgrounds

Curriculum Empowerment

Industry-specific courses and immersive learning experiences

Ecosystem Support

Comprehensive network and real-world application



STEM students, young engineers and entrepreneurs



To discover the next generation of entrepreneurs, the next construction tech unicorn company



It has been held for **10** events with **400** participants



Partner institutions **20+**



**Building a Better Life with
Smart Construction**



Hong Kong Center
for Construction Robotics
香港智能建造研發中心



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