会学习的农田作业机器人
Self-learning Agricultural Robots

用科技实现农业可持续高产、优质、高效
Achieve sustainable high-yield, high-quality, and efficient agriculture through technology

北京中科原动力科技有限公司
Beijing AIForce Technology Co., Ltd.

www.aiforcetech.com

Ag Tech: A Short History

农业科技简史

智能化时代的农业
Agriculture in the era of intelligence

People

人力

Horses

畜力

Tractors

拖拉机

Robots

机器人

中科原动力 AIForceTech

国内头部农业机器人公司
Agricultural Robotic Company Deeply Rooted in the Fields

中科原动力是由中国科学院微电子所孵化的农业机器人国家高新技术企业，2019年正式运营，总部位于北京市海淀区。

AIForceTech is a national high-tech enterprise for agricultural robots incubated by the Institute of Microelectronics of the Chinese Academy of Sciences. It was officially put into operation in 2019 and is headquartered in Beijing.

🏆 **国家专精特新小巨人**　　🏆 **国家高新技术企业**　　🏆 中关村高新技术企业

🏆 北京市金种子企业　　🏆 北京市前沿科技项目　　🏆 中科院科技合作平台重点项目
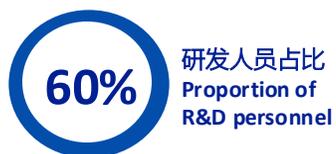
- China Specialized & Refined Enterprize
- National High-Tech Enterprize
- Zhongguancun High tech Enterprise
- Key Projects of the Science and Technology Cooperation Platform of the CAS
- Beijing Golden Seed Enterprise
- Haidian District Embryo Enterprise

60% 研发人员占比
Proportion of R&D personnel

150+ 核心知识产权
Core intellectual property rights

66K ha 机器人应用面积
application area of agricultural robots

多次被人民日报、农民日报、央视等多家权威媒体报道
Reported multiple times by authoritative media such as People's Daily, Farmers' Daily, CCTV, etc

海外研发、生产与销售中心
Overseas R&D, production and sales center

产品应用地区
Product application region

2024年新增产品应用区域
New additions in 2024 Product application region

北京总部研发中心
Beijing Headquarters R&D Center

🏆 奖项荣誉 Industrial Awards

中国农业农村部最高奖—全国农牧渔业丰收奖

中国农业农村部十大引领性技术

中国农业机器人创新大赛一等奖

中国新能源农机金奖

世界智能大会智能科技创新应用优秀案例

2022中国自动化领域年度创新成长企业

恰佩克年度技术创新产品奖

The highest award from the Ministry of Agriculture and Rural Affairs of China - National Harvest Award for Agriculture, Animal Husbandry, and Fisheries

Top Ten Leading Technologies of the Ministry of Agriculture and Rural Affairs of China

First Prize in China Agricultural Robot Innovation Competition

China's Smart Agriculture Enterprise

Excellent Cases of Intelligent Technology Innovation and Application at the World Intelligence Conference

2022 China's Automation Industry in Annual Innovation and Growth Enterprises

Chapec Annual Technology Innovation Product Award

李德毅
首席科学家
LI DEYI
CHIEF SCIENTIST

中国工程院院士，欧亚科学院院士，中国人工智能最高成就奖获得者，长期从事不确定性人工智能和智能驾驶领域研究

An academician of the Chinese Academy of Engineering, honorary president of the Chinese Association for AI, winner of China's highest achievement award for AI, and long-time researcher in the fields of AI with uncertainty and intelligent driving

韩威
创始人CEO
HAN WEI
FOUNDER & CEO

清华大学博士，UC Berkeley联合培养，中科院副研究员，师从中国工程院李德毅院士，从事人工智能与农业机器人领域研究

Ph.D. from Tsinghua University with an educational background at UC Berkeley, associate research fellow of the Chinese Academy of Sciences, student of academician Li Deyi of the Chinese Academy of Engineering, and researcher engaged in the field of AI and agricultural robots

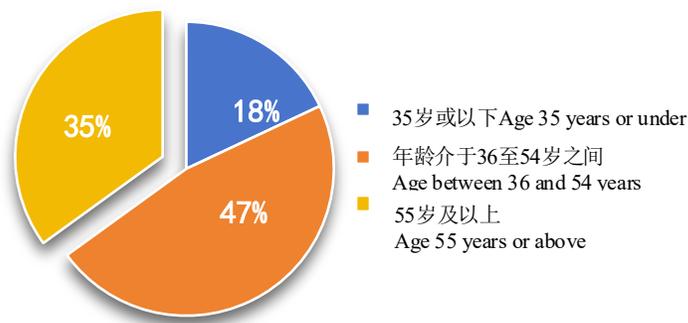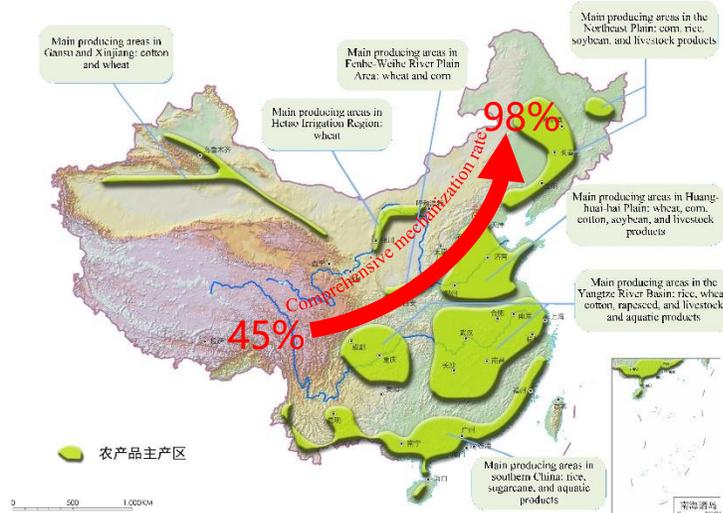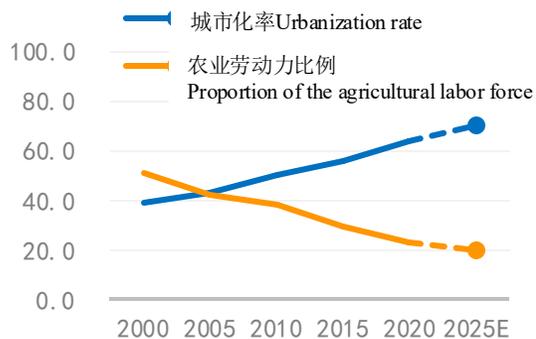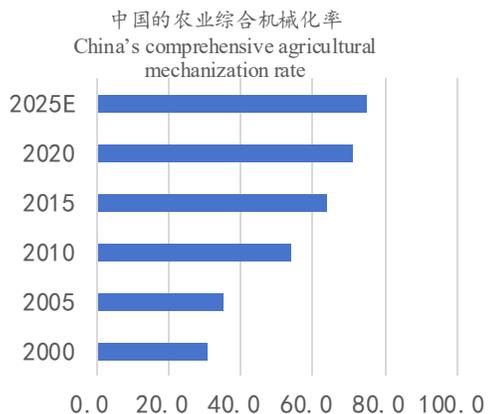|	
技术团队 Technical team	来自清华、伯克利、早稻田等世界知名高校的技术队伍，1/4具有博士学位。 Composed of talents who graduated from Tsinghua University, UC Berkeley, Waseda University, and other prestigious universities. A fourth of the team holds a doctorate degree.
产品团队 Product R&D team	曾就职于世界知名农业和工程机械企业的优秀产品工程师队伍。 Product engineers once served in world-renowned agricultural and construction machinery enterprises.
市场团队 Marketing team	曾就职于全球知名农业机械企业，海内外市场拓展经验丰富。 Senior marketing elites once served in well-known agricultural machinery enterprises in China and other countries, with experience in expanding domestic and overseas markets.
财务团队 Financial team	财务团队具有成功带领企业上市的经历与宝贵经验。 The financial team has the experience of successfully leading enterprises in IPOs and possesses valuable expertise in this field.

中国的农业综合机械化率
China's comprehensive agricultural mechanization rate

城市化率Urbanization rate
农业劳动力比例
Proportion of the agricultural labor force

98%
45%
Comprehensive mechanization rate

农产品主产区

35%
18%
47%

- 35岁或以下Age 35 years or under
- 年龄介于36至54岁之间 Age between 36 and 54 years
- 55岁及以上 Age 55 years or above

农业生产面临的两大痛点：

Two major pain points for agricultural producers:

- 高机械化率：能够操控专业高端农业机械的人很少。
- 低机械化率：缺少农业机械，招募大量工人进行劳动密集型农业生产非常困难。
- **High mechanization rate: few operators are capable of manipulating professional high-end farm machinery**
- **Low mechanization rate: without farm machines, recruiting many workers for labor-intensive agricultural work is highly difficult.**

我们认为We believe that:

- 在劳动力短缺和老龄化的双重影响下，用机器替代是不可避免的。智能农业机器人将成为未来农业生产的主要力量。
- **Under the double impact of shortages and aging agricultural workers, replacing labor with machines is inevitable.Intelligent agricultural robots will be the main force in agricultural production in the future.**

中科原动力智牛号无人驾驶拖拉机

中科原动力 AIForceTech
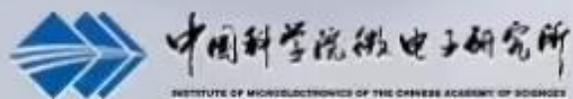
传统农机Traditional Farm Machines
作业方式痛点显著Key Pain Points

每天 Daily

2 operators
2 位机手

1 farm tractor
1 台拖拉机

20 ha/day
300 亩/台

✕ 用工荒 Severe Labor Shortage
- 机手难找，尤其农忙时，平均年龄55岁
- Hard to find skilled operators (avg. age: 55)

✕ 成本高 High costs
- 工资低了没人干，高了雇不起
- Low wages don't attract workers
- high wages break the budget

✕ 效率低 Low efficiency
- 长时间疲劳作业，压力大，效率低

✕ 事故多 Safety Risks
- 农业作业每年致伤、致残数万人
- Tens of thousands of operators suffer injury or disability every year

✕ 技术差 Poor skills
- 水平差别大，熟手少，易带来故障与事故
- many workers experience failures and accidents owing to insufficient knowledge or caution

✕管理难 Management Challenges
- 不听话、情绪化、偷懒
- Operators may be unproductive, unmotivated

智能农机AIForcetech Intelligent Farm Machines
作业方式优势明显Key Advantages

每天 Daily

1 operator
1 位工人

2+ farm tractors
2+ 台拖拉机

27 ha/day(1 set)
400 亩/台

✓ 成本大幅减少 Significant Cost Reduction
- 一人管多机Cuts labor costs (1 person runs multiple machines)
- 降低管理成本Lowers management overhead
- 燃油消耗减少3-5%Saves 3-5% fuel via optimized routes
- 电力技术节省60%的能源成本Saves 60% energy costs via electric technology

✓ 效率提升30% 30%+ Efficiency Boost
- 更快速度Faster speed (8-10 km/h)
- 更长作业时间longer daily operation (20+ hours)

✓ 增加收入20-30% 20-30% Income Increase
- 提高土地利用效率（+1-2%）Better land use (+1-2%)
- 减少收获损失（-1-5%）reduced harvest loss (-1-5%)

✓ 降低技能门槛及增强安全性 Lower Skill Barriers & Enhanced Safety
- 减少对经验丰富操作人员的依赖 Less reliance on highly experienced operators
- 降低现场事故发生率 Reduced on-field accidents

国内L4级农业机器人领航者Leader of L4 Level Unmanned Agricultura Machinery in China

L4无人驾驶功能
L4 Autonomous Driving Function
适配耕种管收运全过程
自适应不同农田、气候条件

便于快速安装推广
L4 Autonomous Driving Function
不打一孔、不减一线、
支持双驾双控、快速安装

适配性强
Strong Adaptability
适配拖拉机、插秧机、
植保机收获机、采棉机等
Agricultural Machinery

智能农机整机
Intelligent tractor

智牛系列Zhiniu Series
L4 Level intelligent
Agricultural Machinery

万途系列Voltor Series
L4-Level intelligent Electric
Agricultural Machinery

打药、除草环节
集巡检、打药、除草等多功能于一体
Spray & Weed Control
Inspection, Spraying, and Weed
Control

运输环节
适应多种复杂地形履带式运输机器人
Transportation
Various ComplexTerrains with
Tracked-Type Transport Robots

智耘系列
无人套件
Zhiniu Series
Unmanned
Module

智农系列
农业机器人
ZhiNong
Series
Agricultural
Robots

采摘环节
用于农业园区、温室等场景无人化采摘
Picking Robot
Unmanned Picking in Agricultural Parks
Greenhouses,and Other Scenarios

中科原动力
AIForceTech

产品矩阵Product Matrix

底盘技术	轮式拖拉机底盘电控实施方案	自研高地隙底盘方案	自研履带底盘方案	自研新能源农机整机方案
Chassis Technology	Electric Control implementation Plan for wheeled Tractor chassis	Self peveloped High Ground clearance chassis solution	Self peveloped Trackchassis solution	Self peveloped newEnergy Agricultural machinery solution

核心算法	农业感知算法	农业定位算法	农业规划算法	农业决策算法	农业控制算法	平台工具
Core Algorithms	Perception	Localization	Planning	Decision-Making	Control	GUI

数据积累	6年完整周期	作业面积100万亩	作物数据	数十种农机、农具操作数据	全周期图像数据	病虫害图像数据
Data Accumulation	Full-Cycle Reliabilityfor 6+ Years	Operating Area of Exceeding a million Acres	Weed pata	Data of Agricultural Machinery and implements	Full cycle crop crowth data	Pest and pisease Data

四大产品系列

Four major product series

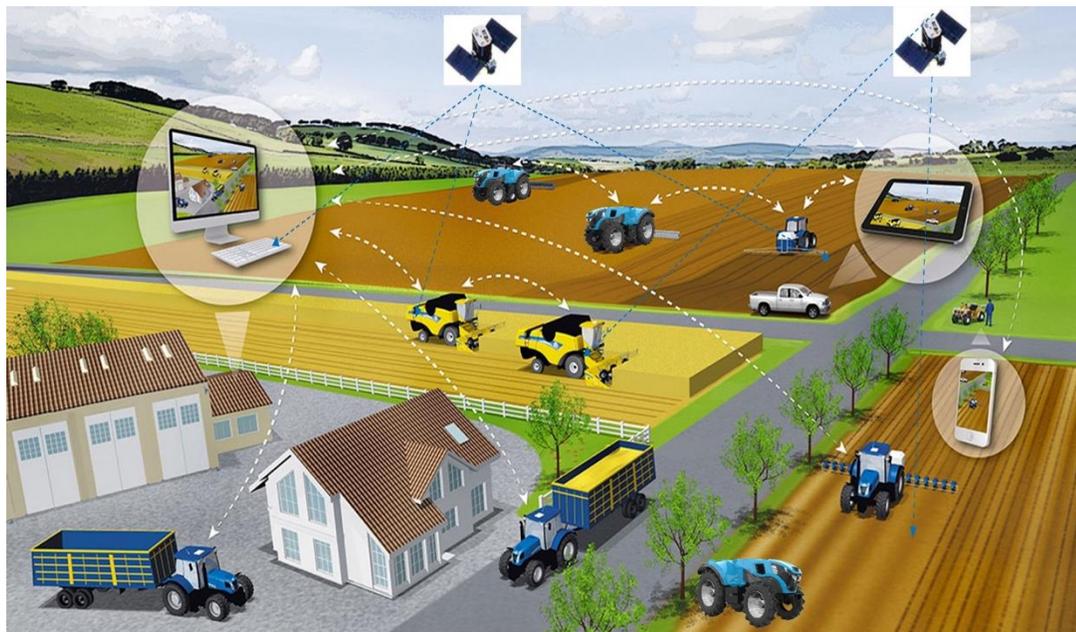| 智耘	智牛	智农	万途
ZhiYun	ZhiNiu	ZhiNong	VOLTOR
农机无人作业系统	智能拖拉机整机	农业机器人	智能电动拖拉机
Unmanned Multi-operation Systems for Agricultural Machinery	Intelligent Tractor	Agricultural Robots	Intelligent and Fully-electric Utility Tractor

数字化智慧农场整体架构示意图
### Schematic diagram of the overall architecture of a digital Intelligent farm

聚焦旱区农作物健康生长，以大数据为驱动、智能驾驶与人工智能技术为核心，构建农机物联网与智慧农业综合平台，实现平台与示范基地的融合应用，打造旱区未来数字智能农场的整体架构。

Focusing on the healthy growth of crops in arid areas, driven by big data and with Intelligent driving and artificial intelligence technology as the core, we will build a comprehensive platform for agricultural machinery Internet of Things and smart agriculture, realizing the integration and application of the platform and demonstration bases, and building the overall architecture of future digital intelligent farms in arid areas.

智能农场的作业示意图
Operational diagram of intelligent Intelligent farm
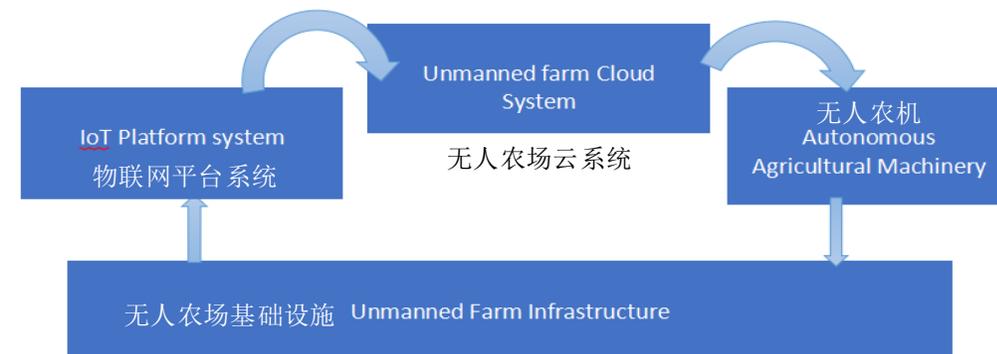
智能农场基础设施：Intelligent farm infrastructure:
通常包含厂房、道路、水电、仓库及传感器安装节点等基础条件。
such as factories, roads, water, electricity, warehouses, and sensor installation nodes.

物联网平台系统：IoT platform system:
智能设备信息、作物信息与环境数据的实时连接与共享。
Real time connection and sharing of data on intelligent equipment information, crop information, and environmental information.

无人农场云系统：Intelligent Farm Cloud Platform System:
智能设备信息、作物信息与环境数据的实时连接与共享。
The storage and learning of crop growth information and data is the neural center of digital agriculture.

智能农机系统：Intelligent agricultural machinery system:
实现农田的耕种、管理与收获作业智能化、精准化、智慧化与高效化。
Making the cultivation, management, and harvesting of farmland Intelligent, precise, intelligent, and efficient.

全国首个出口蔬菜无人智慧农场

应用案例：Unmanned products have been implemented in multiple provinces, gaining recognition through cooperation with large state-owned enterprises.

头部客户广泛合作　　北大荒集团 BEIDAHUANG GROUP　　中粮 COFCO　　中国融通农发　　中化 SINOCHEM　　中储粮 SINOGRAIN

新疆建设兵团农场
Xinjiang Production and Construction Corps First Division, Seventh Division.

中亚农场 Central Asian Farm

北大荒集团水稻无人农场
Beidahuang Group Rice Unmanned Farm

北大荒克山农场马铃薯无人农场
Beidahuang Keshan Farm Potato Unmanned Farm

新疆自治区昌吉回族自治州智能棉田
Smart Cotton Field in Changji Prefecture, Xinjiang Autonomous Region

新疆自治区昌吉回族自治州的智能棉田
Smart Cotton Field in Changji Prefecture, Xinjiang Autonomous Region

融通集团玉米无人农场
Rongtong Group Corn Unmanned Farm

吉林农安玉米无人农场。
Jilin Nongan Corn Unmanned Farm.

北京金太阳生产型蔬菜无人农场
Jintaiyang Production-oriented Vegetable Unmanned Farm in Beijing

北大荒集团大豆无人农场
Beidahuang Group Soybean Unmanned Farm

北京首农翠湖农场
Cuihu Farm of Beijing Shounong Group

吉林公主岭国家农业高新技术产业示范区无人农场
Princess Ridge National Agricultural High-tech Zone Unmanned Farm in Jilin

欧洲农场 European Farms

四川宜宾无人农场
Yibin Rice Unmanned Farm in Sichuan

北京国家精准农业示范基地
National Precision Agriculture Demonstration Base in Beijing

中科原动力
AIForceTech

未来农业
FUTURE OF FARMING

让农业更简单更高效
Make farming simpler and more efficient

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