



米文动力  
MIIVII TECH

INNOVATING THE EDGE

边 缘 智 能 提 供 商  
EDGE INTELLIGENCE PROVIDER

**INNOVATING THE EDGE**



## 关于米文

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北京米文动力科技有限公司成立于 2015 年，是一家专业从事嵌入式人工智能科技的高新技术企业，致力于提供软硬一体的边缘计算产品及技术，是早期布局 NVIDIA Jetson 边缘计算场景的厂商之一，也是国内首批英伟达全球生态推荐战略合作伙伴。

自 2015 年初至今，米文动力已获得云天基金、嘉铭浩春、硅谷资本中国、北汽产投、时间投资等总额上亿的投资。凝聚了一批来自加州大学、奥克兰理工、中科大、上海交大、人大等国内外知名院校的高学历人才，拥有一支技术精湛、经验丰富的专业研发、技术队伍为用户保驾护航。

基于云计算的人工智能应用，在很多场景出现延时高、功耗高、带宽占用多、存储压力大、隐私保护差等众多问题。对此，米文动力打造多种算力的计算产品，旨在边缘侧提供低延时、低功耗、高性能的算力平台，为人工智能算法模型部署和应用落地提供坚实基础。

目前公司拥有自主知识产权 40 余项，产品广泛应用于商用车 / 特种车辅助驾驶、无人配送车、无人机、无人清扫车、车路协同、工业视觉、零售、安防等领域。单个产品出货量超过 K 级，业务从中国拓展到美国、澳大利亚等 7 个国家，服务海内外各行业客户逾 200 家。





## ABOUT MIIVII TECH

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MIIVII Technology Inc. is a national high-tech enterprise founded in 2015, specializing in embedded artificial intelligence technology. MIIVII TECH is committed to provide edge computing products and technologies for enterprises. The company is one of the first vendors to layout edge computing business by using NVIDIA Jetson, as well as one of China's first preferred NVIDIA Jetson ecosystem partners.

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Since the beginning of 2015, MIIVII TECH has received hundreds of millions investment in financing from Cloud Angel Fund, Jiaming Haochun Investment Fund, SVB Capital China, BAIC Capital and TIME Capital. MIIVII TECH has gathered a group of highly educated talents from the University of California, Auckland University of Technology, University of Science and Technology of China, Shanghai Jiao Tong University, Renmin University of China and other well-known universities and colleges. MIIVII TECH also has a professional research and development team with excellent skills and rich experience to provide the best services for users.

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Cloud-based AI applications have a lot of problems such as high latency, high power consumption, high bandwidth usage, high storage pressure, and poor privacy protection in many scenarios. In this regard, MIIVII Tech has created computing products with diversified computing power, aiming to provide a computing platform with low latency, low power consumption and high performance at the edge side, and to provide a solid foundation for the deployment and implementation of AI algorithm models.

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Currently, MIIVII Tech has over 40 independent intellectual property rights, and our products are widely used in many fields, including but not limited as assisted driving for commercial/special vehicles, driverless delivery vehicles, unmanned aerial vehicle, unmanned sweepers, vehicle-road collaboration, industrial vision, and retail security. With the annual sales volume of a single product exceeds thousands, MIIVII Tech's business has expanded from China to seven countries, including the United States, Australia and five more countries, serving over 200 influential customers in various industries.



# 米文 & 英伟达

MIIVII & NVIDIA



# ELITE PARTNER

- Preferred NVIDIA Jetson Ecosystem Partner
- NVIDIA NPN Elite Partner
- NVIDIA Jetson 授权分销商
- NVIDIA Jetson Authorized Distributor



# 产品及服务矩阵

## Product And Service Matrix



在线升级  
Upgrading Online

云管平台  
Cloud Management Platform



### 软件功能 Software function

PPS同步  
PPS synchronization

Sync out同步  
Sync out synchronization

Sync in同步  
Sync in synchronization

异步触发  
asynchronous trigger

独家专利：微秒级 单芯片时钟同步解决方案  
Exclusive patent: microsecond/single-chip clock synchronization

### BSP及驱动 BSP and the driver

支持多种传感器和外设的接入 系统 OTA 持续更新支持列表 提供典型场景的传感器方案建议  
Supporting access to a wide range of sensors and peripherals, continuously updating the support list via OTA, providing sensor adaptation for typical scenarios

### 计算机平台硬件 Computing platform hardware

MIIVII LITE NANO/TX2  
NX/NX(0.47TFlops  
/ 1.33TFlops / 21TOPS)

MIIVII LITE NANO/TX2  
NX/NX MINI(0.47TFlops  
1.33TFlops / 21TOPS)

MIIVII EVO TX2 GMSL2  
(1.33TFlops)

MIIVII EVO XAVIER  
(32TOPS)

MIIVII APEX XAVIER/  
XAVIER II (32TOPS)

标准品  
Standard products

定制品  
Customized products



批量烧写软件  
Massive image burning  
software

图形化配置软件  
graphical system setting  
interface

售后技术服务论坛  
After-sales  
technical service  
forum

在线服务邮箱  
Online  
servicemailbox -  
Helpdesk

项目管理平台  
Project  
management  
platform - Jira

生产力工具  
Productivity tools

高效敏捷服务  
Efficient and prompt services

# 硬件标准产品

## Standard Hardware Products

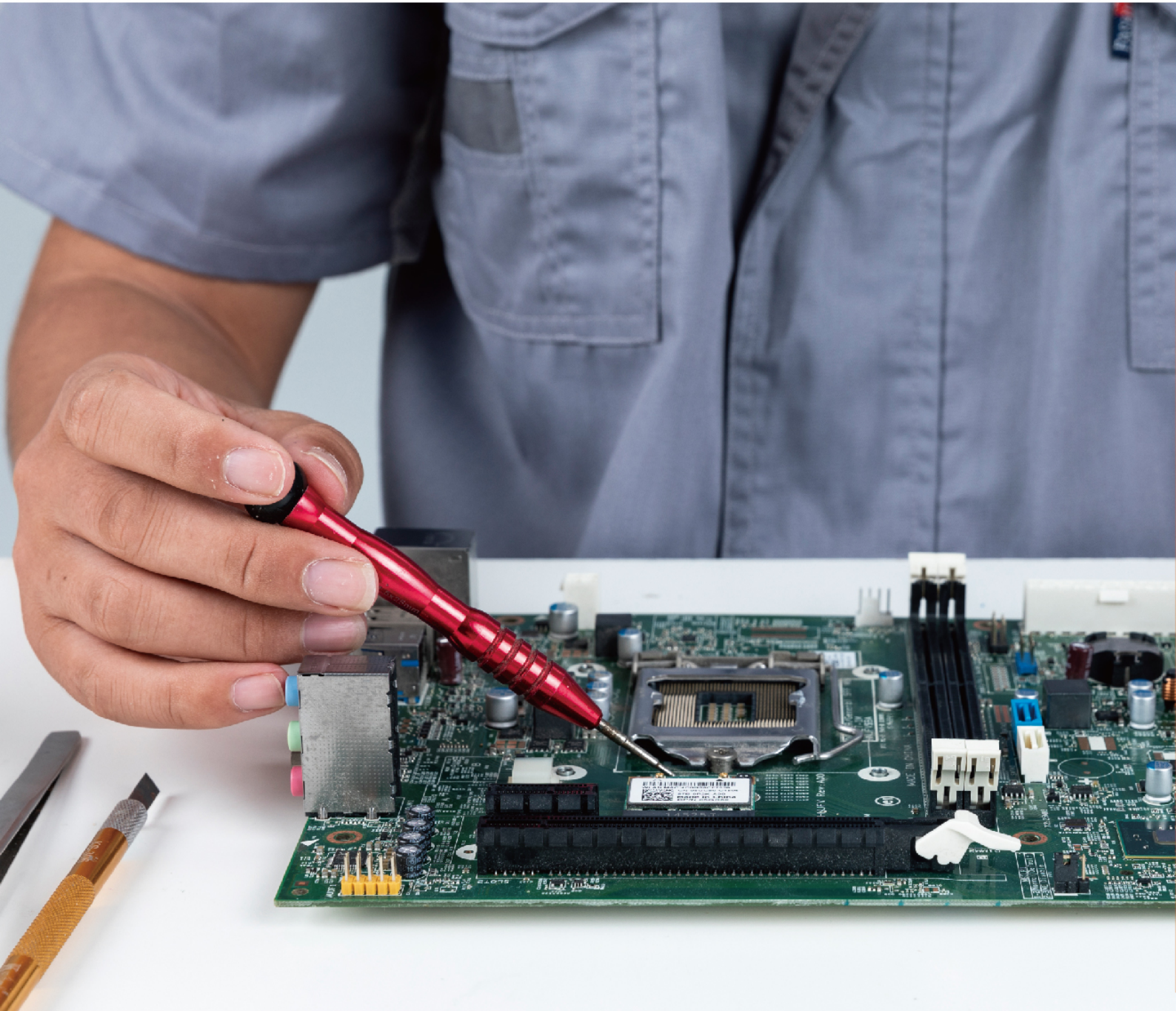
	APEX 车载系列 APEX Vehicle-mounted Series	EVO 工业系列 EVO Industrial Series	LITE 监控系列 LITE Monitoring Series
Orin	<p>MIIVII APEX ORIN</p>  <p>规划中 Under planning</p>		
AGX Xavier	<p>MIIVII APEX XAVIER</p>  <p>8*GMSL2、时钟同步、异步触发、IP65 防护等级 8*GMSL2、clock synchronization、asynchronous trigger、IP65 Protection</p>	<p>MIIVII EVO XAVIER</p>  <p>4*PoE 网口 支持被授时 4*PoE port、timing support</p>	
Xavier NX			<p>MIIVII LITE NX II (芯片可替换为 TX2 NX 或 NANO)</p>  <p>IP5X 防护等级、2*GbE 接口 SATA3.0/M.2 M 扩展口 IP5X Grade Protection 2*GbE SATA3.0/M.2 M expansionslot</p>
TX2		<p>MIIVII EVO TX2 GMSL2</p>  <p>6*GMSL2、被动散热 6*GMSL2 passive cooling</p>	
TX2 NX			<p>MIIVII LITE TX2 NX (芯片可替换为 Xavier NX 或 NANO)</p>  <p>低功耗、多 PoE 网口 low power consumption multiple PoE ports</p>
Nano			<p>MIIVII LITE NANO (芯片可替换为 TX2 NX 或 Xavier NX)</p>  <p>小体积、工业级防静电 small size industrial grade anti-static function</p>



## 多项产品测试 严格把控质量

Multiple Product Testing Strictly Control The Quality

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## 可靠性测试

### Reliability Test

- 严格实验环境的高低温、湿热、盐雾、振动、抗冲击测试
- ESD、防浪涌、磁场干扰等国家标准 EMC 测试
- High and low temperature, damp and heat, salt spray, vibration/shock resistance tests in strict experimental environments
- ESD, anti-surge, magnetic interference and other national standard EMC tests

## 物理可靠性测试

### Physical reliability test

- 设备反复重启测试超 1000 次
- 所有按键按压测试超 100 次
- 设备接口拔插测试超 100 次
- Over 1000 repeated device restart tests
- Over 100 all buttons press tests
- Over 100 device interfaces plug and unplug tests

## MTBF实际测试超过1000小时

### Over 1000 hours of actual MTBF testing



# 硬件定制服务

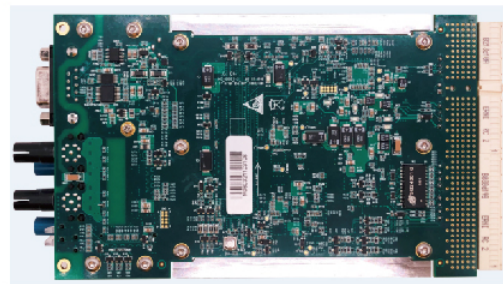
Hardware Customization Service



## 轨道交通规格

Rail traffic standards

- 便于部署的 CPCI 板卡形态
- -40-85°C 工作环境
- 航插接口器件
- CPCI board card form that is easy to deploy
- -40-85°C operating environment
- M12 connectors







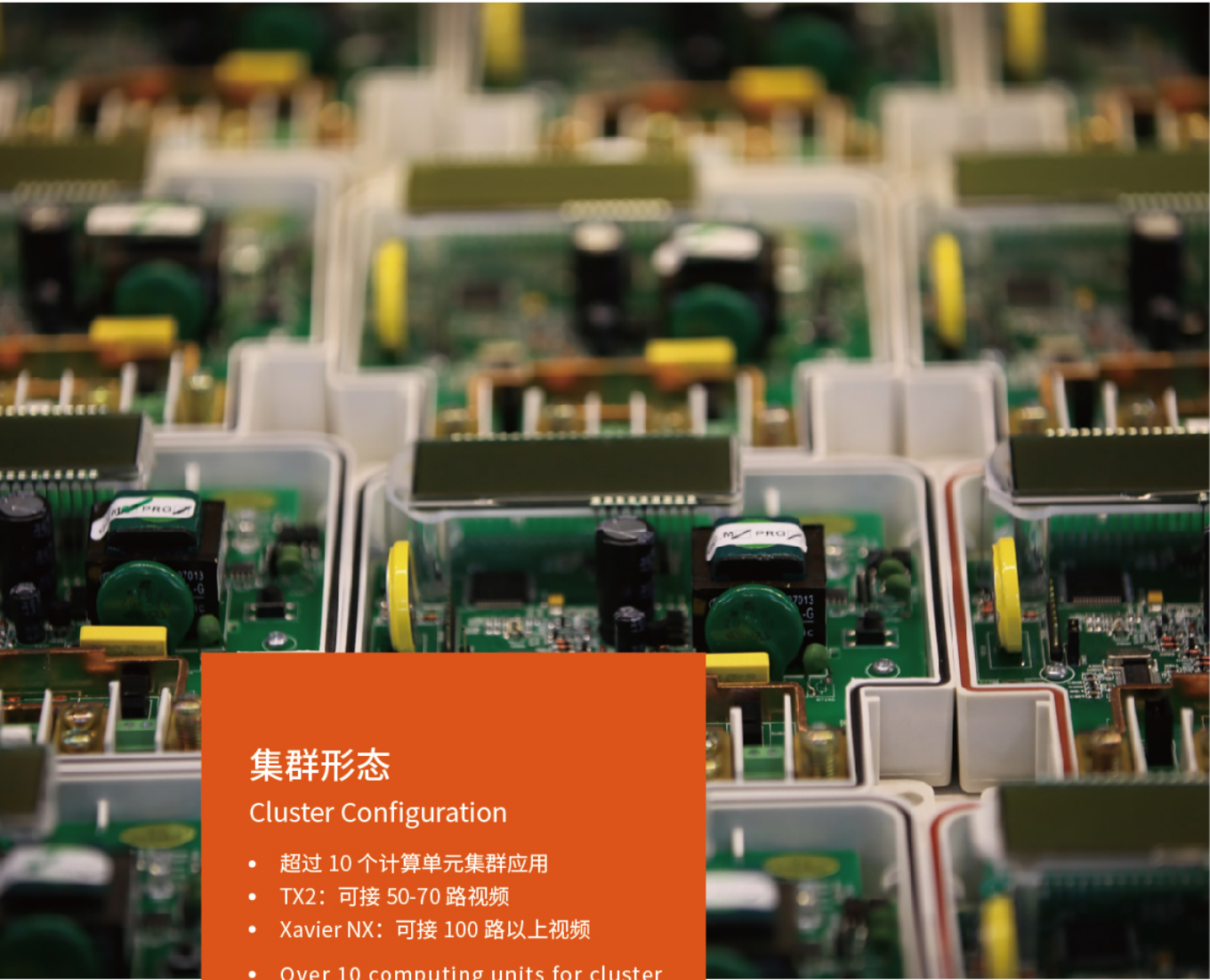
## 矿区多接口设备

Multi-interface equipment for mining sites

- 极致接口数量
- IP65 高规格防护
- 满足矿场恶劣环境要求
- Maximum number of interfaces
- IP65 high level protection
- Adapting to the harsh environment of mining sites



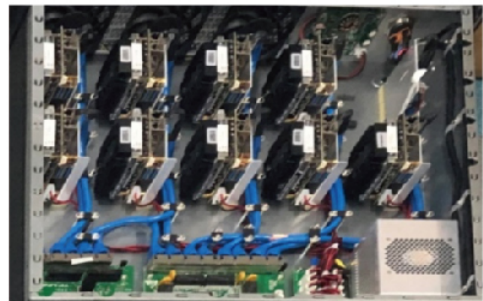




## 集群形态

### Cluster Configuration

- 超过 10 个计算单元集群应用
- TX2: 可接 50-70 路视频
- Xavier NX: 可接 100 路以上视频
- Over 10 computing units for cluster applications
- TX2: 50-70 channels of videos process
- Xavier NX: more than 100 channels of videos process





## 无人机应用

### Unmanned Aerial Vehicle Application

- 极致裁剪
- 小而轻稳定接口
- 按实际接口需求定制
- 降低成本
- Minimum size cutting
- Small, light and stable interfaces
- Customized to the actual interface requirements
- Reducing costs





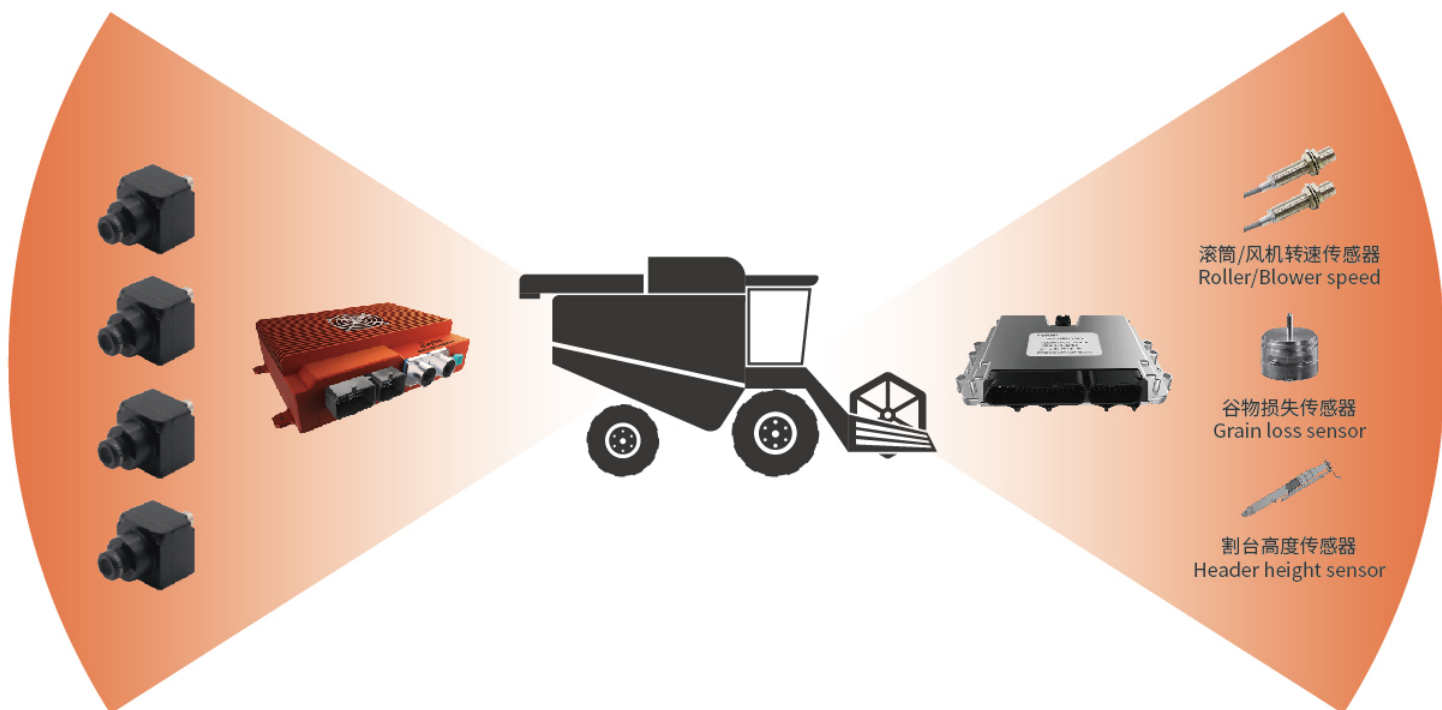
# BSP及驱动层

## BSP And The Driver Layer

- 系统 OTA 在线更新支持列表
- 支持多种传感器和外设接入
- 提供典型场景的传感器方案建议
- Continuously updating the support list via OTA
- Supporting access to a wide range of sensors and peripherals
- Providing sensor adaptation for typical scenarios

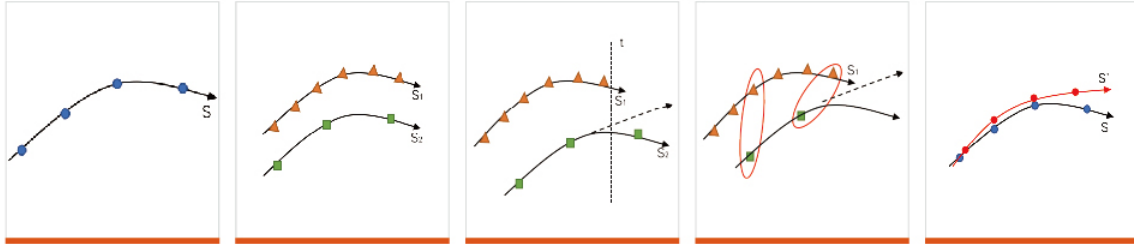
## 智能小麦收割机传感器适配方案

### Intelligent Wheat Harvester Sensor Adaptation Scheme



# 时钟同步功能

## Clock Synchronization



- 01**  
动态障碍物真实情况  
Actual situation of dynamic obstacles
- 02**  
不同传感器观测  
Observations with different sensors
- 03**  
不能保证同时到达融合环境  
Simultaneous arrival at the fusion environment cannot be guaranteed
- 04**  
不同时刻数据错误匹配  
Data mis-matching at different moments
- 05**  
给出错误位置与速度  
Showing wrong position and speed



支持多种设备授时方式：  
PTP 授时、GPS 授时

Support a variety of equipment timing methods:  
PTP timing, GPS timing



支持多传感器时钟同步：  
激光雷达、摄像头、IMU 等

Support clock synchronization of multiple sensors:  
LIDAR, Camera, IMU, etc.



支持多数据接口：  
RS422/RS485/RS232/TTL

Multiple data interfaces:  
RS422/RS485/RS232/TTL



支持多种同步方式：  
PPS 同步、Sync in 同步、Sync out 同步、异步触发

Support multiple ways of synchronization:  
PPS synchronization, Sync-in synchronization, Sync out synchronization, asynchronous synchronization

## 时钟同步方式对比

### Comparison of Clock Synchronization Methods





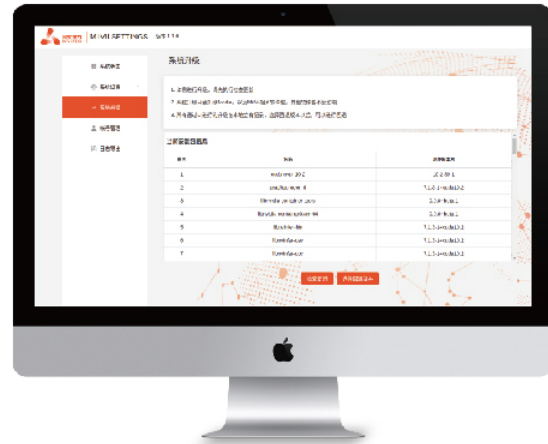
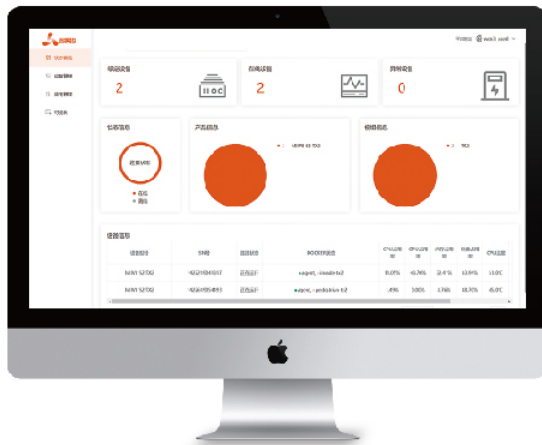
# 云管功能

## Cloud Management

### 远程监管

#### Remote monitoring and management

- 实现：SaaS 或私有云灵活部署
- 功能：远程查看设备状态和异常设备,及时预警
- 效果：便于批量化部署,节省维护成本
- Implementation: SaaS or flexible deployment in a private cloud
- Functions: Remotely checking the status of equipment & abnormality warning
- Effects: Easy for mass deployment & saving maintenance costs



### 系统在线升级 (OTA)

#### Over-the-air update (OTA)

- 说明：Jetpack4.5 及以上版本可通过可视化界面进行系统版本升级和回退
- 优势：免砖  
自建服务器,可快速下载  
可视化界面,便于用户端操作
- Instruction：Jetpack 4.5 and above can be upgraded and rolled back via user interface
- Advantages：Avoiding“bricking”OTA, updating in any time  
Self-built server for fast downloads  
Visible user interface for convenient operation

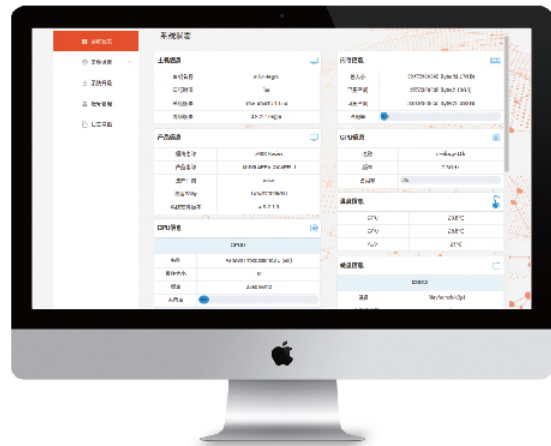
# 生产力工具

## Productivity Toolkit

### 批量烧写工具

#### Massive image burning tool

- 支持镜像克隆
- 支持多设备批量烧录,节省部署时间
- 图形化界面操作简单,降低烧录操作门槛
- Support image cloning
- Support batch burning of multiple devices, saving deployment time
- Graphical interface for burning operation, easy to use



### 图形化配置工具

#### Graphical Configuration Tool

- 图形化操作
- 降低设备在部署现场的配置难度
- Graphical operation
- Reduce the difficulty of configuring equipment at the deployment site

## 镜像烧录方式对比

### Comparison of Image Burning Methods

米文镜像烧录软件 MIIVII image burning software	<b>镜像烧录方式</b> Image Burning Method	英伟达 SDK Manager+ 接口 驱动补丁包 NVIDIA SDK Manager+ interface driver package
图形化操作 Graphical operation	<b>软件操作方式</b> Software operation	图形化 + 操作命令 Graphical+ operating command
<b>米文设备 镜像烧录</b> Image burning of MIIVII devices	<b>是否支持镜像克隆</b> Support image cloning or not?	不支持 No
支持 Yes	<b>镜像下载速度</b> Downloading speed of images	300-500KB/s
3-5MB/s	<b>设备批量部署</b> Batch deployment of equipment	单台依次操作 Operating in sequence by a single server
可批量烧写镜像 Batch burning image	<b>镜像服务器</b> Image Server	百度云 / 英伟达美国服务器 Baidu Cloud / NVIDIA US Server
国内 / 米文自有服务器 Domestic/ MIIVII owned server		



# 服务介绍

## Service Introduction

### VIP客户一对一 即时支持

One-by-one immediate support for VIP customers



### FAE现场技术支持

FAE on-site technical support

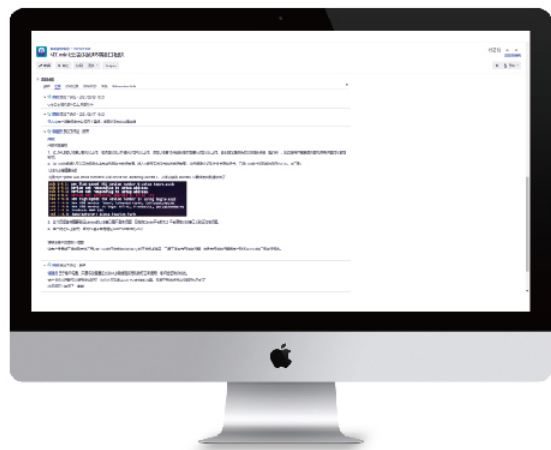
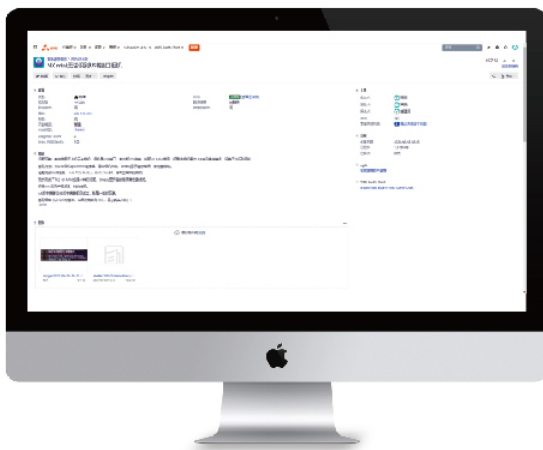




## 售后技术服务论坛 After-sales technical service forum



## 在线服务邮箱 Online service mailbox - Helpdesk



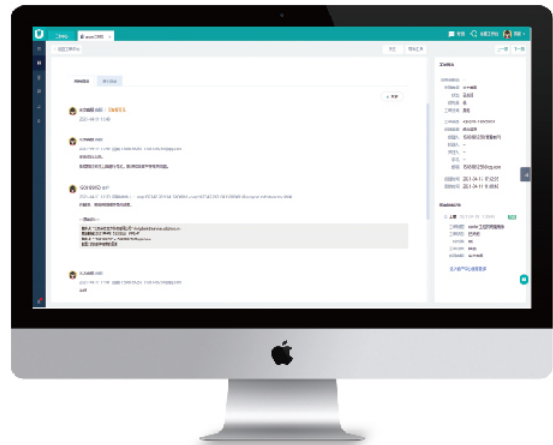
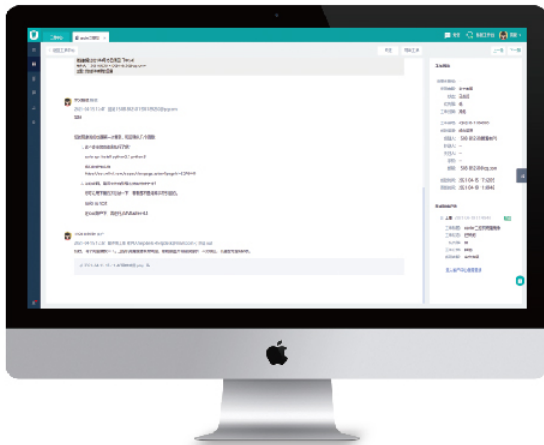
## 远程/上门培训

Remote/On-site training



## 专业的项目管理平台

Professional project management platform





# 典型应用案例

## Typical Application Case



### 智能农机——小麦收割机

Smart farm machinery — wheat harvester

基于 MIIVII APEX XAVIER 设备实现辅助驾驶感知计算  
Assisted driving aware computing platform based on MIIVII APEX XAVIER

- 功能：  
小麦倒伏识别、降低含杂率、感知谷仓状态、降低漏收率
- 最终效果：  
提高产量，每亩多收 60-80 斤  
提高生产效率，半天即可收完 600 亩地
- Functions:  
Recognize the wheat lodging, lowering the impurity rate, sensing the barn status, reducing the rate of missed harvests
- Final effects:  
Increase yield, get an extra 30-40 KG of wheat per Mu  
Enhance productivity, complete 0.4 km<sup>2</sup> of harvest within half a day







## 车路协同——路侧融合感知一体机

Vehicle-road collaboration——Roadside fusion and sensing all-in-one machine

基于 MIIVII EVO XAVIER 的路侧融合感知一体机  
Roadside fusion and sensing all-in-one machine based on MIIVII EVO XAVIER

- 功能：  
通过多传感器同步融合功能，为场端车路协同提供精准感知和定位方案，并通过 V2X 与车辆实时通讯  
作为全息路口感知平台，是实现交通场景数字孪生的基础
- Functions:  
Provide accurate sensing and positioning solution for road-side vehicle-road collaboration through multi-sensor synchronous fusion, real-time communication with vehicles via V2X system  
Serve as a holographic intersection sensing platform, which is the basis for realizing the digital twinning of traffic scenes





## 远程驾驶作业——挖掘机

Remote driving operations — excavators

基于 MIIVII EVO TX2 GMSL2 的远程驾驶感知计算  
Remote driving aware computing platform based on EVO TX2 GMSL2

- 功能：  
低于 300ms 延时的远程驾驶、2D 图像定位
- 效果：  
提高作业效率,单斗循环时间可达 18s  
可实时操作 2500 公里外的工程车辆
- Functions:  
Remote driving within 300ms delay, 2D image positioning
- Effects:  
Improve operational efficiency, a single bucket cycle time up to 18 second  
Operate engineering vehicles from 2500 KM away in real time





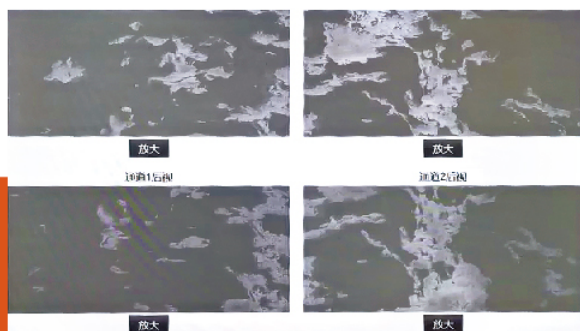


## 工业视觉检测

### Industrial vision inspection

基于 MIIVII EVO Xavier 的棉花异纤检测计算  
Cotton foreign fibre detection computing based on EVO Xavier

- **优势:**  
利用设备高实时性和强大算力，创造了对 4K 图像的超实时运算网络，能够在边缘侧自动合成海量样本，克服深度学习算法对数据量要求巨大的困境
- **最终效果:**  
将传统 70-80% 的检出率提高到 90%
- **Advantages:**  
Use the device's real-time performance and great computing power to create an ultra-real-time computing network for 4K images, automatically synthesize massive samples at the edge side, overcome the dilemma of the data size required by deep learning algorithms
- **Final effects:**  
Increase the traditional 70-80% detection rate up to 90%







## 教育机器人

### Educational robots

基于 Nano 定制设备的智能驾驶开发套件  
Smart driving development kit based on Nano customized device

- 优势:

利用 Nano 作为 NVIDIA 芯片的生态优势, 能够支持丰富的计算网络和框架, 开发者可轻松获取激光点云、姿态和图像数据进行 SLAM 和路径规划的应用及算法实践

- Advantages:

Leverage Nano's ecological advantage as an NVIDIA chip, support rich computing networks and frameworks, allow developers to easily access laser-point cloud, posture and image data for SLAM and path planning applications as well as algorithm practices





## 零售门店管理

### Retail store management

基于 MIIVII Lite NX Mini 的营销数据结构化分析平台  
Structured analytics platform for marketing data based on Lite NX Mini

- 功能：  
门店客流统计、热力图分析、可帮助门店评估促销效果、调整商品布局、进行员工监管等
- 优势：  
小体积、低噪音、可对相机数据实时处理的高算力设备
- Functions:  
Count store customer flow, analyze heat map, help shops to evaluate the effectiveness of promotions, adjust product layout, supervise staff, etc.
- Advantages:  
Small size, low noise, high computing power device for real-time processing of camera data



## 部分客户

Our Clients

业务从中国拓展到美国、澳大利亚等7个国家，服务海内外各行业客户逾200家

MIIVII TECH's business expanded from China to seven countries, including the US, Australia and five more countries, provided services for over 200 customers in various industries at home and abroad.

 HUAWEI

优必选  
UBTECH

 高新兴  
GOSUN

 LANDING AI

 CANBOT  
ROBOT FOR YOUR BETTER LIFE

 阿里云

TRUNK  
主线科技

 CIDI  
希迪智驾

Quicktron快仓  
快人一步 智领未来

 中国中车  
CRRC

ZOOMLION  
中联重科

 卓视智通  
SINDITS

Lenovo

 广汽集团  
GAC GROUP

 滴滴

 一汽解放

 W  
迈外迪

 智行者  
ICMVERPLUS

Tencent 腾讯

 CHERY

 清华大学

美团

 科大讯飞  
IFLYTEK

 科亿科技  
KEYETECH



# 合作伙伴

Cooperation Partner



百度智能云物联网教育解决方案战略合作伙伴

Strategic partner of BAIDU Intelligent Cloud IoT Education Solutions



百度 Apollo 生态合作伙伴

Ecosystem partner of BAIDU Apollo



CAI  
N!AO 菜鸟

菜鸟“驼峰计划”合作伙伴, 获突出贡献奖

Partner of Cainiao “Tuofeng Plan”, winning the Outstanding Contributions Award



腾讯AI加速器  
Tencent AI Accelerator

腾讯第二期 AI 加速器成员

Member of Tencent's second-term AI Accelerator project

# 荣誉及认证

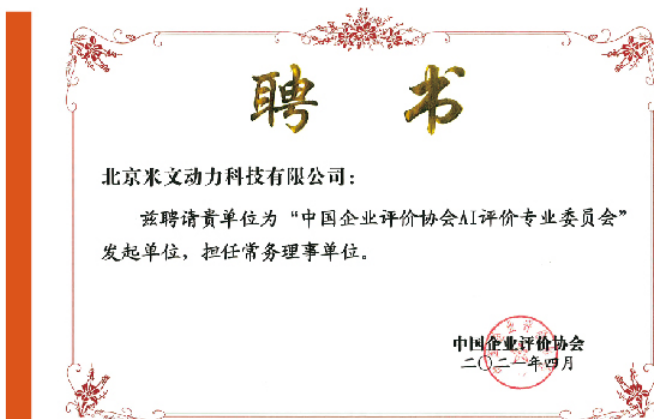
## Honor and Certification



国家高新技术企业  
China high-tech enterprise

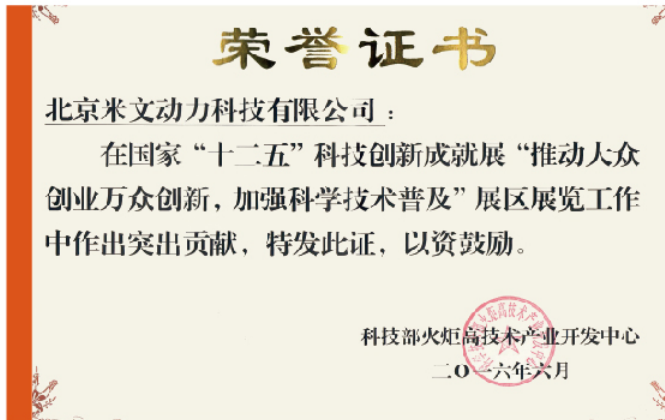


ISO9001 认证企业  
ISO9001 certified enterprise



“中国企业评价协会 AI 评价专业委员会”发起单位 / 常务理事单位  
China Enterprise Evaluation Association "AI Evaluation Professional Committee" Initiator/Executive Director





“十二五”科技创新成就  
Achievements in scientific and technological innovation during the 12th Five-Year Plan period



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