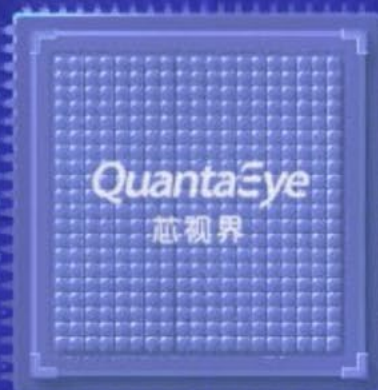
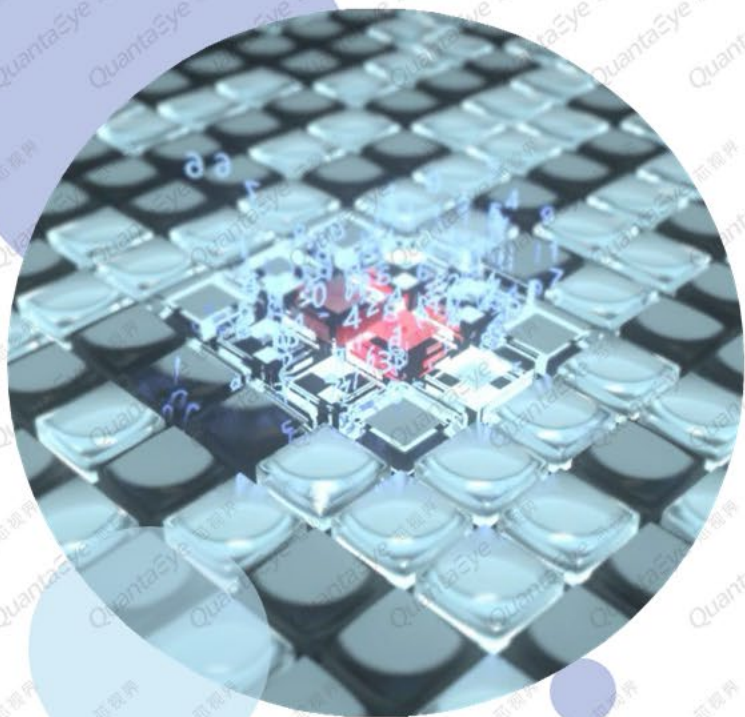


量子点光谱传感技术 及其在水利领域的应用

A Water Quality
Monitoring System via
Quantum Dot Spectrometer

孙常库
Sun Changku





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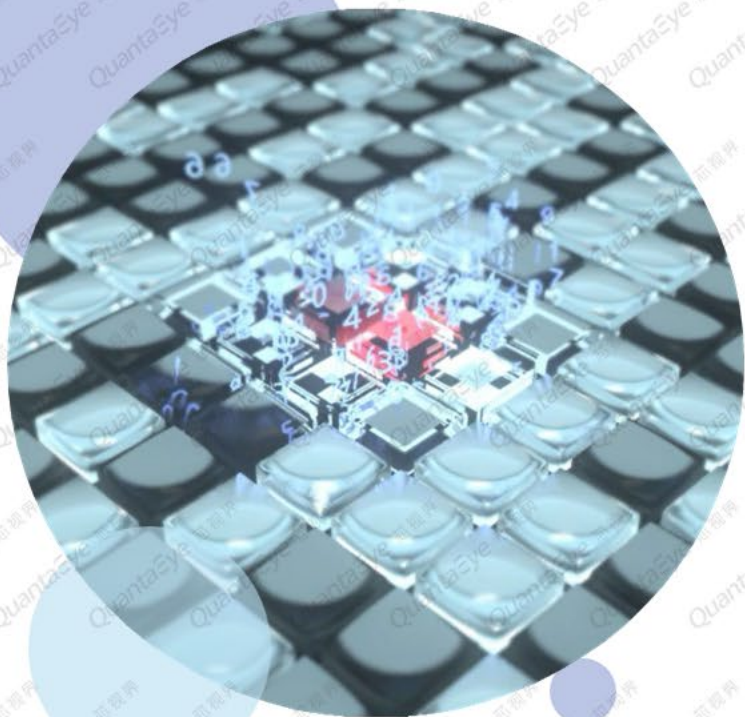
应用场景

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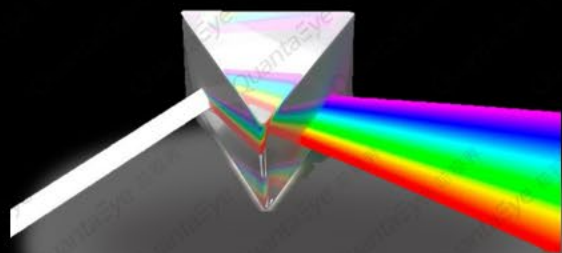
应用场景

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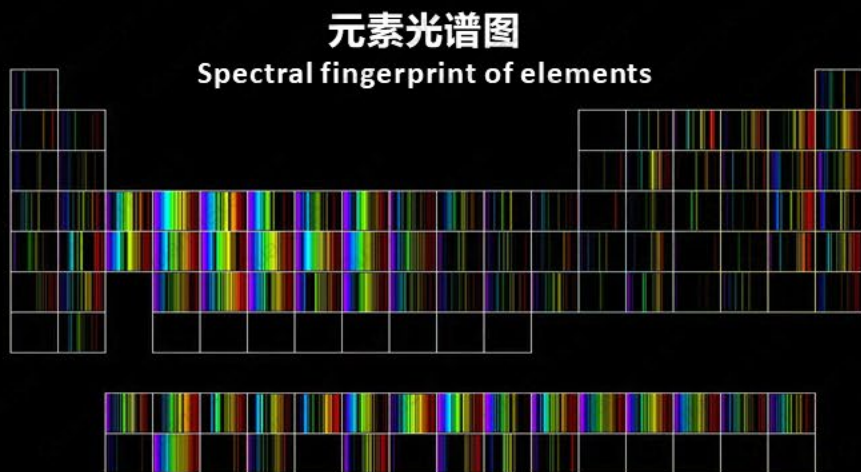
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光谱——物质的指纹
Spectrum – “Fingerprint of substance”



“Sensorization”
Spectrometer
光谱仪芯片化

传感器-Sensor

- 数据来源 Source of data
- 信息来源 Source of information

人工智能
Artificial Intelligence (AI)

数据
Data

传感器
Sensor

Substance ...
物质 ...

温度-Temperature
湿度-Humidity
位置-Position
压力-Pressure

图像-Image
角度-Angle
距离-Distance

Sensors are the basis of AI big data
传感器是人工智能大数据的基础

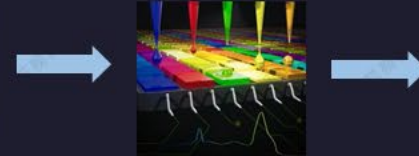
$\frac{1}{1000}$ 体积, 重量
Size, Weight

让我们获得了将传统将光谱仪器的体积、重量缩小近千倍, 同时成本大幅降低的能力。

We are able to reduce the size and weight of the traditional spectrometer by 1000 time, with lower cost.



量子点
Quantum Dot



量子点光谱芯片
Quantum Dot Chip



量子点光谱传感器
Quantum Dot Spectral Sensor

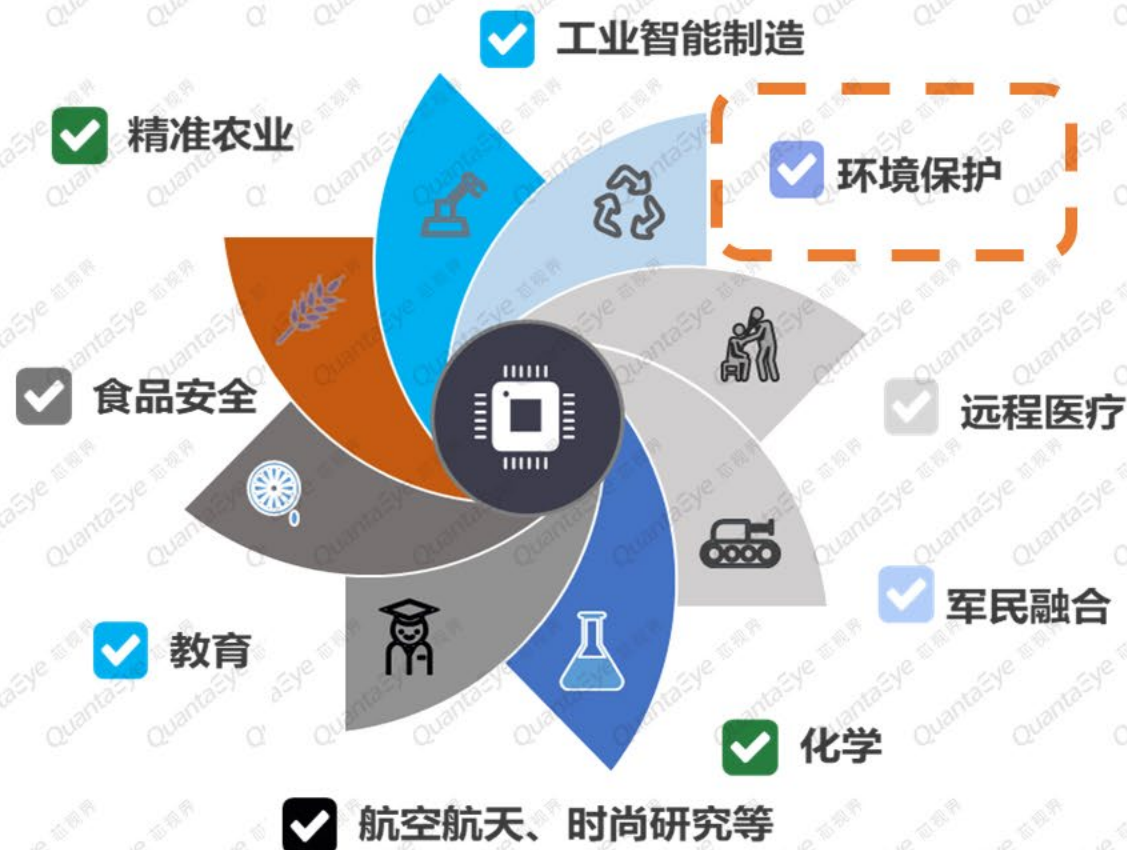
“Sensortize” Spectrometer 光谱仪传感器化

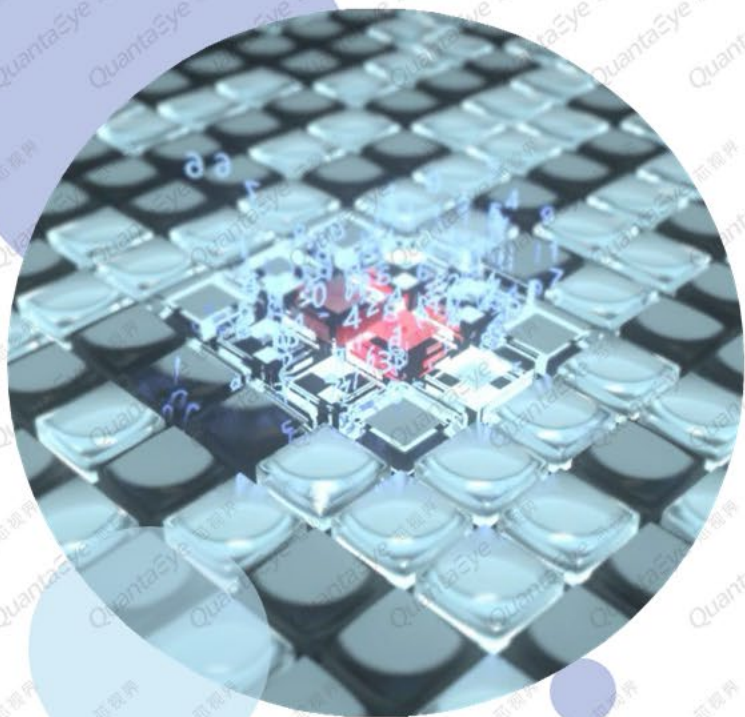
Moving out of lab
将光谱数据从实验室带
入日常生活中

Possible Applications 广泛应用场景

Cumululating spectral data
不断积累
光谱数据资源

Spectrum Big Data Platform 光谱大数据平台





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智能感知是实现水环境智慧监测的破局点

Intelligent Perception is the Breaking Point for Realizing Intelligent Monitoring of Water Environment

QuantaEye
芯视界



Artificial Monitor
人工检测

1-3 days



Automatic
Monitor
自动化监测

1-4 hours



Miniaturization &
Automation
Monitor
小型化&自动化
监测

1 hour



Miniaturization &
Intelligentization
Monitor
微型化&智能化
监测

in-situ real time
原位实时

一站式综合解决方案

One-stop Comprehensive Solution

QuantaEye
芯视界

融入微型传感技术、物联网技术、一体化设计
Micro Sensor Integration of Technology, IoT Technology and Integrated Design



地表水
监测智能终端
Surface water monitor
intelligent terminal

排水管网
监测智能终端
Drainage pipeline network
monitor intelligent terminal

Contact: 400-9009830

产品特点——智能监测终端

Product Features — Water Monitor Intelligent Terminal

QuantaEye
芯视界

地表水

Surface water

管网

Pipeline network

37cm



&



27cm

微型光谱水质监测设备
Micro spectral water quality detector



监测指标多

Many monitoring indicators

- Pipeline network: temperature, turbidity, COD, conductivity.
- Surface water: temperature, pH, conductivity, dissolved oxygen (DO), turbidity, COD, BOD, TOC, permanganate index, SS.



监测频率高

High monitoring frequency

- **Real time collection**, quick analysis, measurement interval of 10 minutes
- NB/GPRS and other **wireless transmission modes**
- 7X24 hour **continuous** monitoring



供电方式多样

Various power supply modes

- **No municipal power supply**, battery or solar power supply
- The pipeline network equipment can operate for 5-6 months with a single charge, realizing **long endurance**.
- Surface water equipment is powered by **solar energy, energy-saving and environment-friendly**



安全级别高

High security level

- **Explosion proof treatment** for the drainage pipeline network detection equipment to ensure the downhole safety
- Waterproof treatment: IP68



工作运维量低

Low O&M workload

- The equipment has **automatic cleaning brushes** to reduce O&M numbers
- **Simple O&M**, no need to go down the well, no need for professional maintenance
- Long O&M interval, number and cost
- Energy-saving and environment-friendly without secondary pollution



布设方式灵活

Flexible layout methods

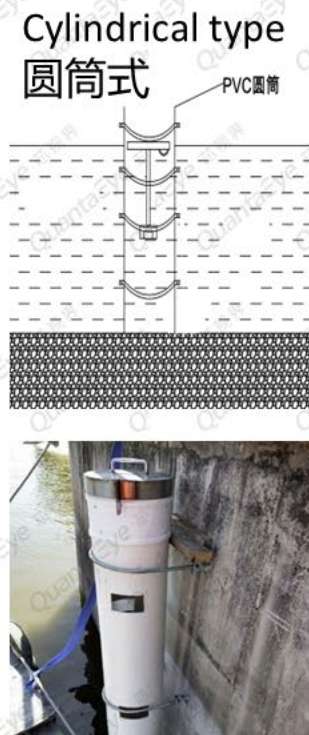
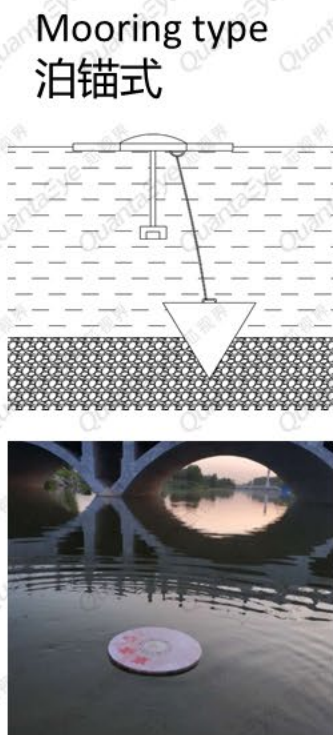
- **Miniaturized equipment**, small size and light weight
- **In situ monitoring**, movable and can be placed in any water area
- **Multiple layout methods** to meet the harsh external environment

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Multiple installation methods, adapt to equipment installation and deployment in different environments.
安装方式多样，适应不同环境下设备安装部署

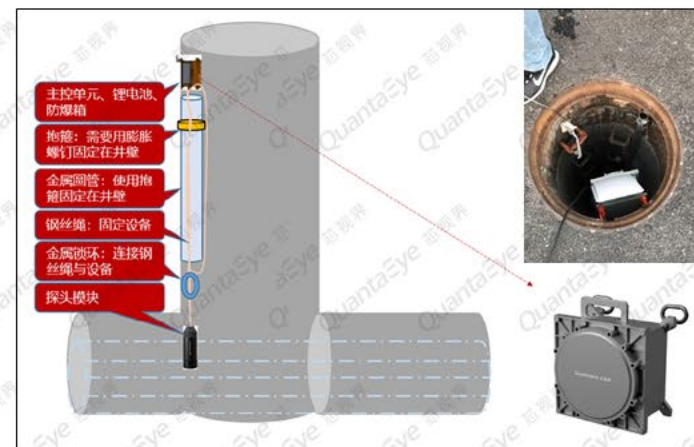


Surface water
monitor terminal
地表水监测终端



Pipeline network
monitor terminal
管网监测终端

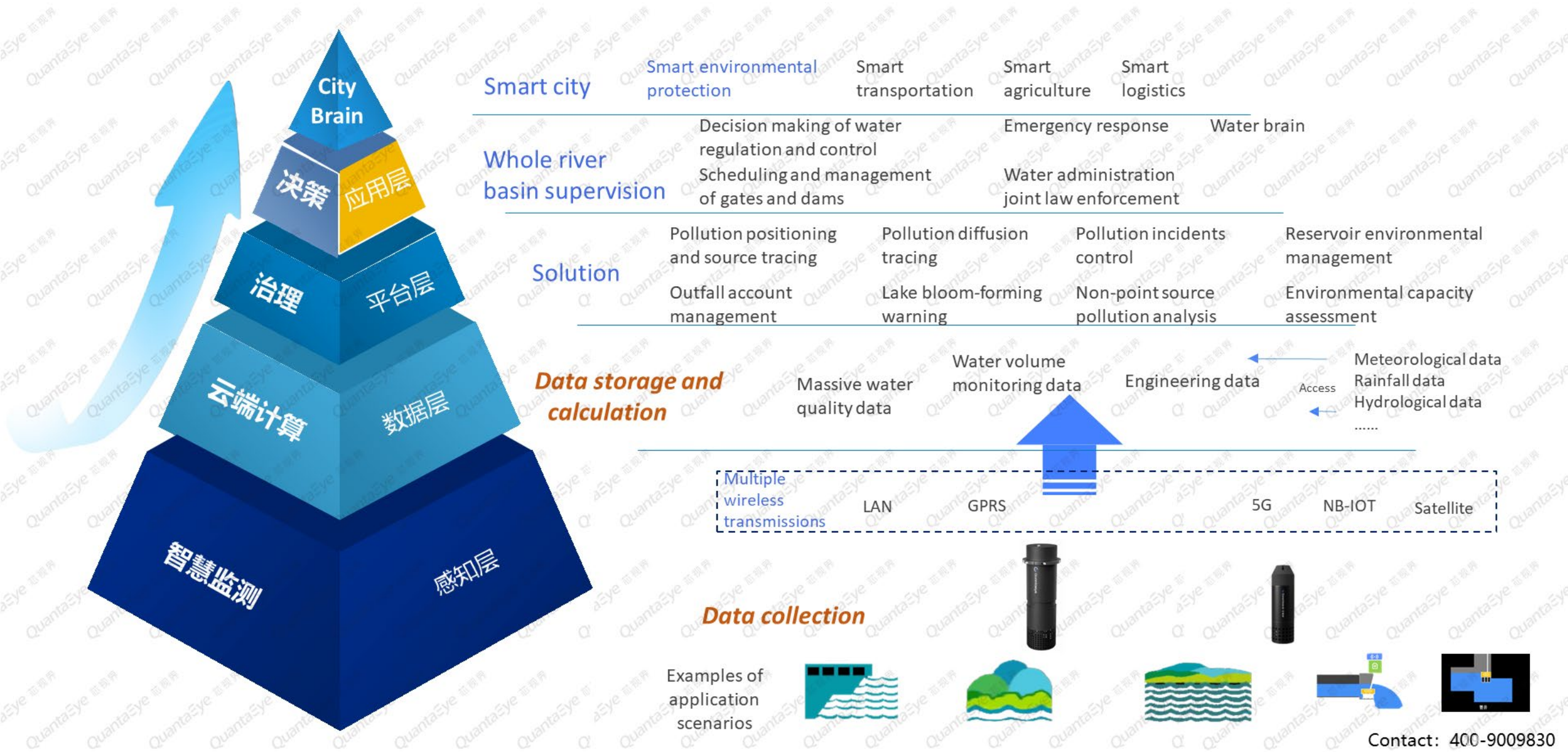
- Flexible installation methods, reduce the impact of water flow on equipment and installation accessories.
- Lifting ropes, convenient and quick installation and O&M without downhole operation.



行业创新 物联网+大数据+移动互联网 智慧解决方案

Industry Innovation IoT + Big Data + Mobile Internet Smart Solutions

QuantaEye
芯视界





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污染精准溯源，辅助查处

Accurately Pollution Tracing and Assist In Investigation

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通过精细化布点精准溯源，大大降低人工排查河道的难度，并对河道污染进行靶向治理，及时制定对策，快速解决污染问题。

The difficulty of manual investigation of the river channel is greatly reduced through the precise distribution of points and the accurate tracing of the sources, and carry out the targeted treatment of the river pollution, formulate countermeasures in time to quickly solve the pollution problem.

Traditional mode 传统模式

发现污染
Find the pollution

水质检测
Water quality detection

追溯源头
Trace the source

问题解决
Solve the problem

>3days

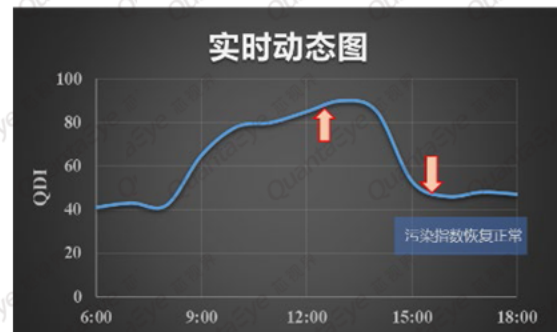
"QuantaEye" mode New speed "芯"模式 新速度

Sewage found
(Alarm within 10 minutes)

Trace the source
(half an hour)

Report and resolve
Turn on the emergency pump to speed up the treatment of influent

Water quality returns to normal (2 hours)

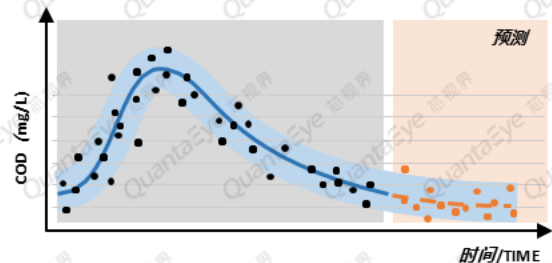


Solve a sewage discharge incident within 3 hours
三小时解决一次排污事件

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Data Monitoring 监测数据

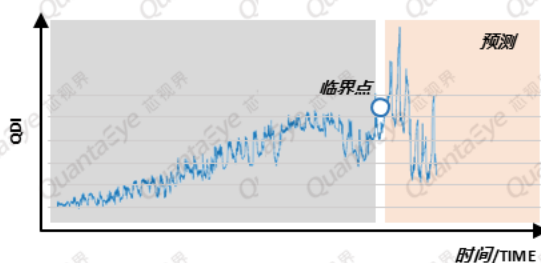
Real-time monitoring and historical data



根据历史累计数据，对未来一段时间的水质变化趋势做出预测
Predict the trend of water quality changes in the future according to historical cumulative data

Trend Analysis 趋势分析

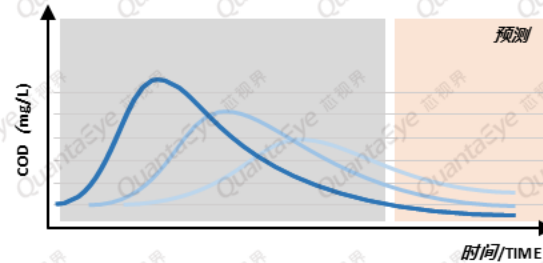
Change patterns and periodic fluctuation



水华监测预警
Bloom-forming monitor warning

Prediction & Warning 预警预报

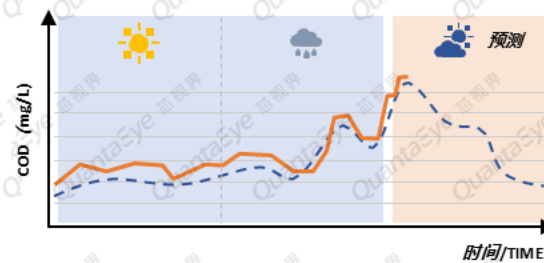
Water quality prediction, simulation prediction



基于污染动态发展过程，预测污染影响结束时间
Predict the finish time of pollution impact based on the dynamic development process of pollution

Plan ahead 提前规划

Annual water environment compliance

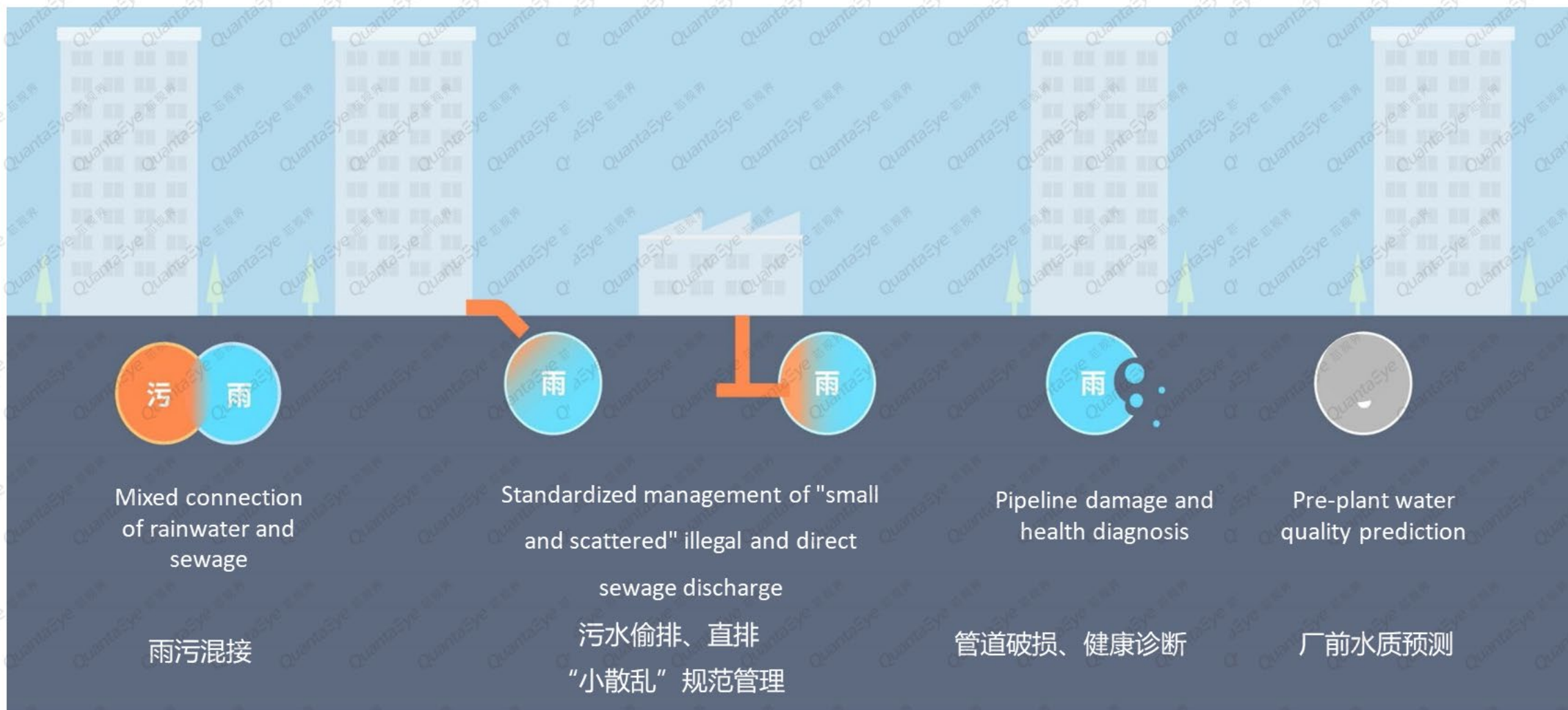


根据天气情况预测水质变化
Prediction of water quality changes according to weather conditions

排水管网健康诊断

Health Diagnosis of Drainage Pipeline Network

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“ We lead the spectral informatization and intelligentization”
全球光谱信息化与智能化的开创者

The Chinese National High-tech Enterprise

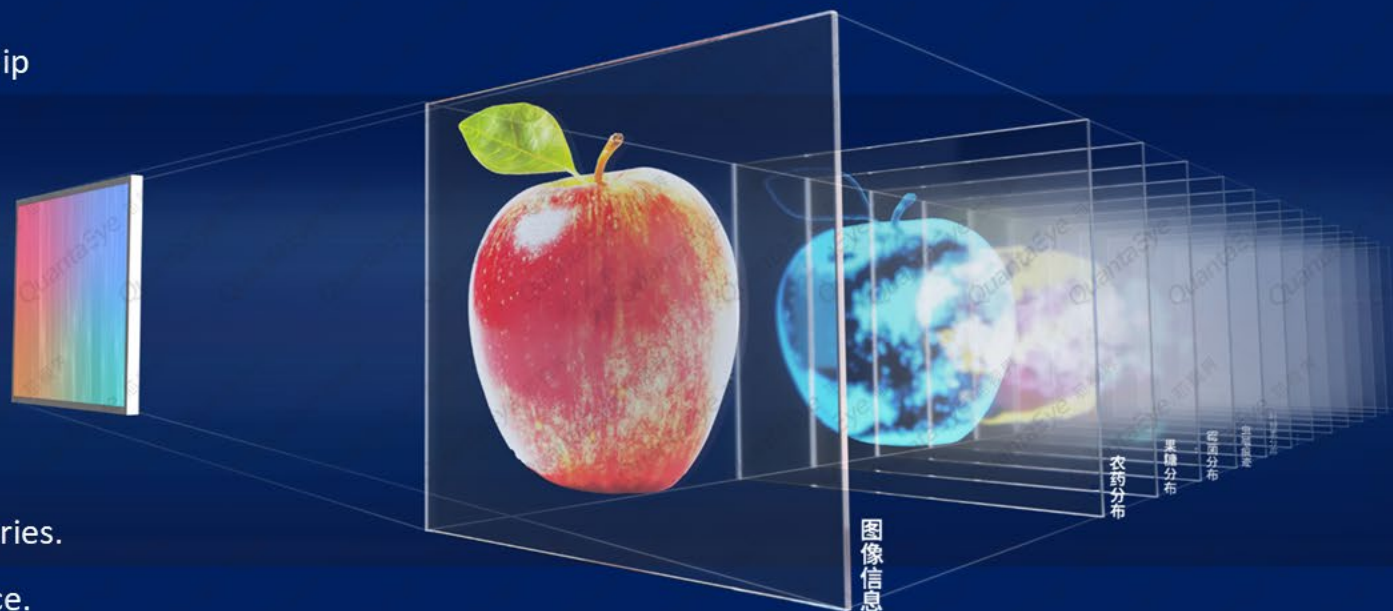
- Research and develop the quantum dot spectrometer chip
- Build and maintain the spectrum big data platform

Disruptive Technology

The worldwide first technology – The quantum dot spectrometer

Team

- Multidisciplinary team with people from different industries.
- 80% of our employees have graduate research experience.





Decode Everything · Lead The Global Spectral Informatization And Intelligentization Era

The First ***Quantum Dot Spectrometer Technology*** In The World
Lead The World Into The Era of Spectral Informatization And Intelligentization

Sun Changku

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Beijing City

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