



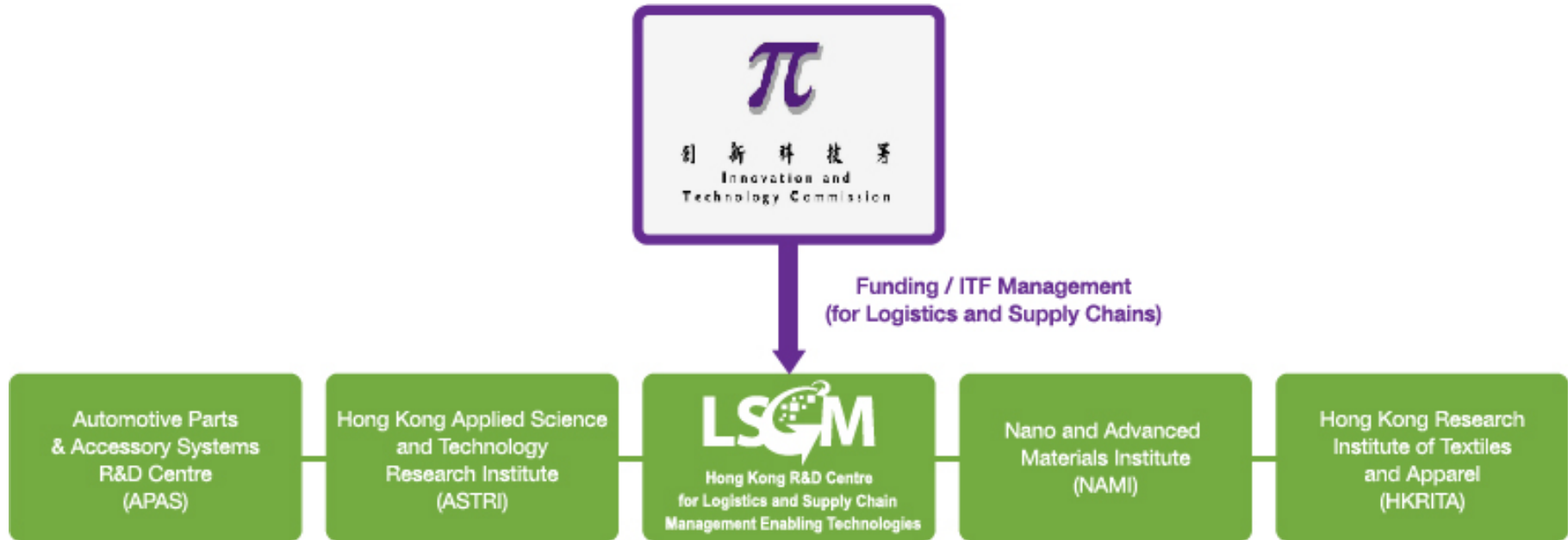
Logistics and Supply Chain MultiTech R&D Centre
物流及供應鏈多元技術研發中心



Presentation for Seminar on New Opportunities for Testing and Certification Sector

Simon Wong - CEO

LSCM R&D Centre



LSCM was founded in 2006 with funding from the Innovation and Technology Fund of HKSAR Government.

LSCM's Model



- ❖ We treasure domain knowledge
- ❖ We are dedicated to public cause
- ❖ We serve industry, esp. SMEs
- ❖ We innovate!

Academia → Research Institutes → Government → Industry
LSCM



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Government Bureaus (10)



Innovation and Technology Bureau

The Government of the Hong Kong Special Administrative Region



Commerce and Economic Development Bureau

The Government of the Hong Kong Special Administrative Region



Development Bureau

The Government of the Hong Kong Special Administrative Region



Food and Health Bureau

The Government of the Hong Kong Special Administrative Region



Home Affairs Bureau

The Government of the Hong Kong Special Administrative Region



Security Bureau

The Government of the Hong Kong Special Administrative Region



Transport and Housing Bureau

The Government of the Hong Kong Special Administrative Region



Financial Services and the Treasury Bureau

The Government of the Hong Kong Special Administrative Region



Labour and Welfare Bureau

The Government of the Hong Kong Special Administrative Region



Environment Bureau

The Government of the Hong Kong Special Administrative Region



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Government Departments (20+)



Highways Department



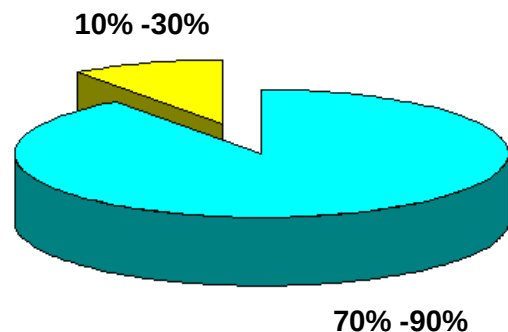
政府資訊科技總監辦公室
Office of the Government Chief Information Officer



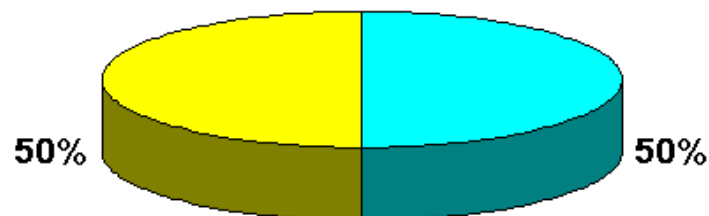
Conducted over 50 R&D Projects with various Bureaus and Departments

Funding programs for R&D projects are administered by LSCM R&D Centre and funded by HKSAR's Innovation and Technology Commission (ITC)

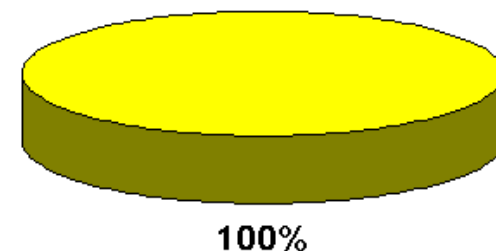
- | | |
|--|--------|
| 1. Platform Research | 平台研究計劃 |
| 2. Collaborative Research | 合作研究計劃 |
| 3. Contract Research | 合約研究計劃 |
| 4. Technology Voucher Programme (TVP) | 科技券計劃 |
| 5. Super Tax Incentive | 超級稅務政策 |



Platform Research
平台技术研究



Collaborative Research
合作技术研究



Contract Research
合约技术研究

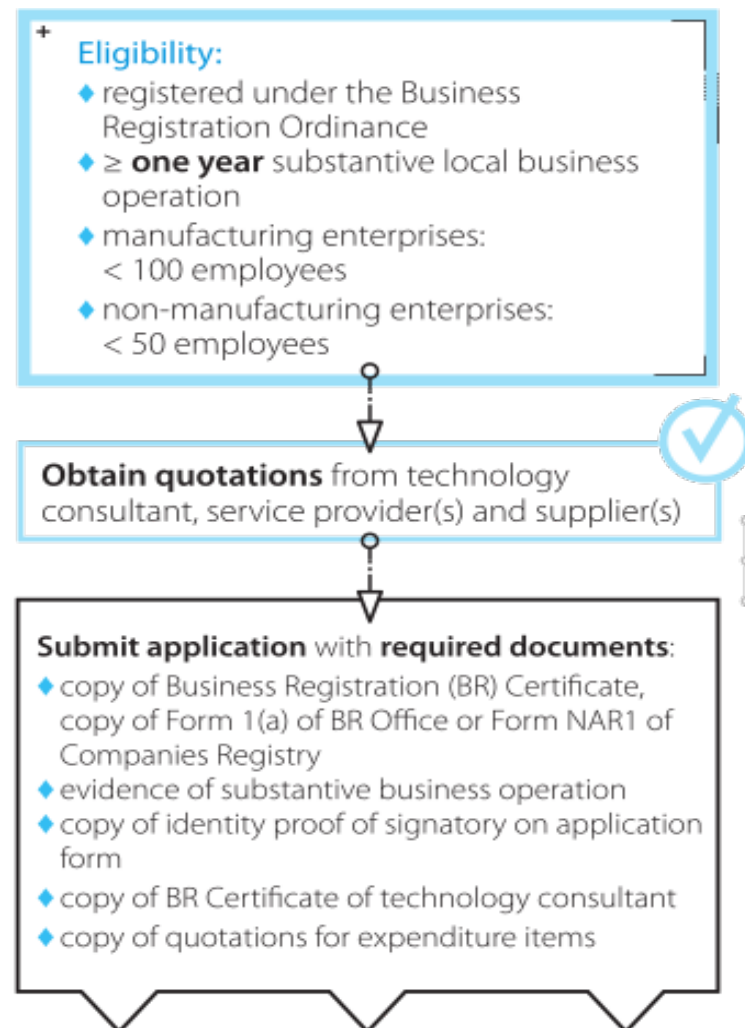
Hosted by local universities and technology support organizations, LSCM provides a one-stop service for applied research, technology transfer and commercialization and help facilitate industries to move up the value chain



Technology Voucher Programme (TVP)

Funding amount:

- Cumulative funding ceiling of \$200,000, up to 3 projects
- 2:1 matching basis:
 - ◆ Enterprise must contribute no less than one third of the total approved project cost in cash.
 - ◆ An enterprise is not allowed to undertake more than one TVP project at the same time.



Enhanced Tax Deduction for Qualifying R&D Expenditure ("Super Tax Incentive")

Schedule 45 附表45	Type A expenditures 甲類開支	Type B expenditures 乙類開支
Rates of deduction 扣除率	100%	300% for the first \$2 million 首200萬元，可獲300%□ □ □ 200% for the remaining amount, there is no cap on the amount of enhanced tax deduction 餘額亦可獲200%扣減；額外扣□ □ □ □ □ □
R&D expenditure qualifying for the deduction 研發支出符合扣除條件	Type A expenditure is defined to mean R&D expenditure on an R&D activity or a qualifying R&D activity other than Type B expenditure. 甲類開支的定義是指R&D活動的研發支出或乙類開支以外的合格研發活動。	Type B expenditure is defined as R&D expenditure on a qualifying R&D activity in respect of: 類型B研發的開支是指: a payment to a "designated local research institution" for out-sourced R&D activities; 支付予「指定本地研究機構」的開支; an expenditure in relation to an employee (excluding a director) who is engaged directly and actively in a qualifying R&D activity; and 支付予進□ □ □ 研發員工(不包括董事)的開支; an expenditure on a consumable item that is used directly in a qualifying R&D activity. 直接用於合資格研發活動的開支。

Challenges for TIC Industry

- Increasing levels of regulation and globalization, such as Food Safety
- Looking to achieve further efficiencies, save on costs and grow margins
- Managing a large number of transactions, especially high demand for SMEs
- TIC requirements are changing frequently and rapidly
- Very labor intensive, such as Inspection Services
- Integrating innovations and accelerating digitization of traditional TIC services

Innovation and Technology Transformation for TIC Industry

The industry is poised for significant technological change as developments in automation, artificial intelligence (AI), IoT and blockchain are set to transform TIC services and offer new capabilities to clients.

TIC Strategies of Innovation and Technology

- Prioritize culture change to accelerate innovation and technology transformation
- Clear scope and objectives of innovation and technology transformation
- Effective gathering and leveraging of customer data
- Expertise to interpret and use data led to processing improvements

Automation

- Increase Productivity and Rapid Throughput
 - ◆ Automation for Repetitive Tasks
 - ◆ Workplace Optimization and Potential OSH Risk Reduction
 - ◆ Expansion of Engineering and Testing Service Capacities
 - ◆ Cost-efficiency for Core Services as well as Higher Added Value Services

Artificial Intelligent

- Simulate Human Activity to Automate Operations
 - ◆ Accelerating Due Diligence
 - ◆ New Insights and Data Discovery for Prediction Analysis
 - ◆ Reduction in Time in Planning and Decision Making
 - ◆ Mitigation of The Risk of Product Failures and Compliance Issue

IoT

- Enhance Inspection Efficiency and Business Opportunities
 - ◆ Digital Customer Engagement, Especially SMEs
 - ◆ Crowdsourcing - External Inspectors Marketplace
 - ◆ Remote/ Field/ Self Inspection - At A Global Scale
 - ◆ Sensors - Automate Data Collection
 - ◆ Big Data Analytics

Blockchain

- Reinforce Entire Supply Chain Traceability and Security
 - ◆ Data Immutability - Reliable Information
 - ◆ Efficiency and Visibility in End-to-End Supply Chain Record Keeping
 - ◆ Smart Contracts and Permissions
 - ◆ Accreditations of Products Origins, Conformity and Regulatory Compliance

Challenges & Opportunities

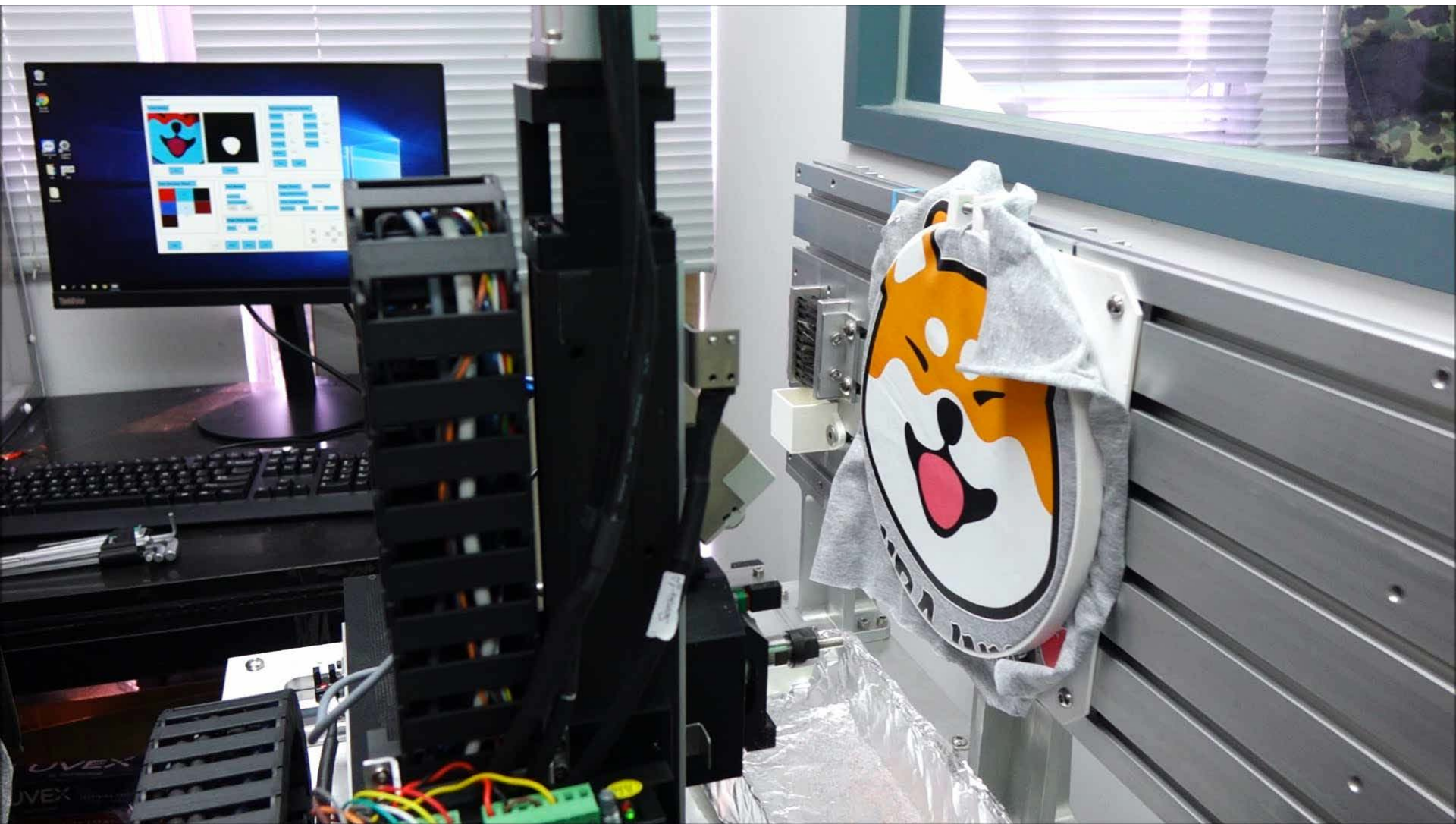
- ◆ Labor shortage – opportunity for automation
- ◆ Data bank – opportunity for Big Data Analytics
- ◆ Export dominated – opportunity for import?
- ◆ Standard difference – opportunity for standard harmonization



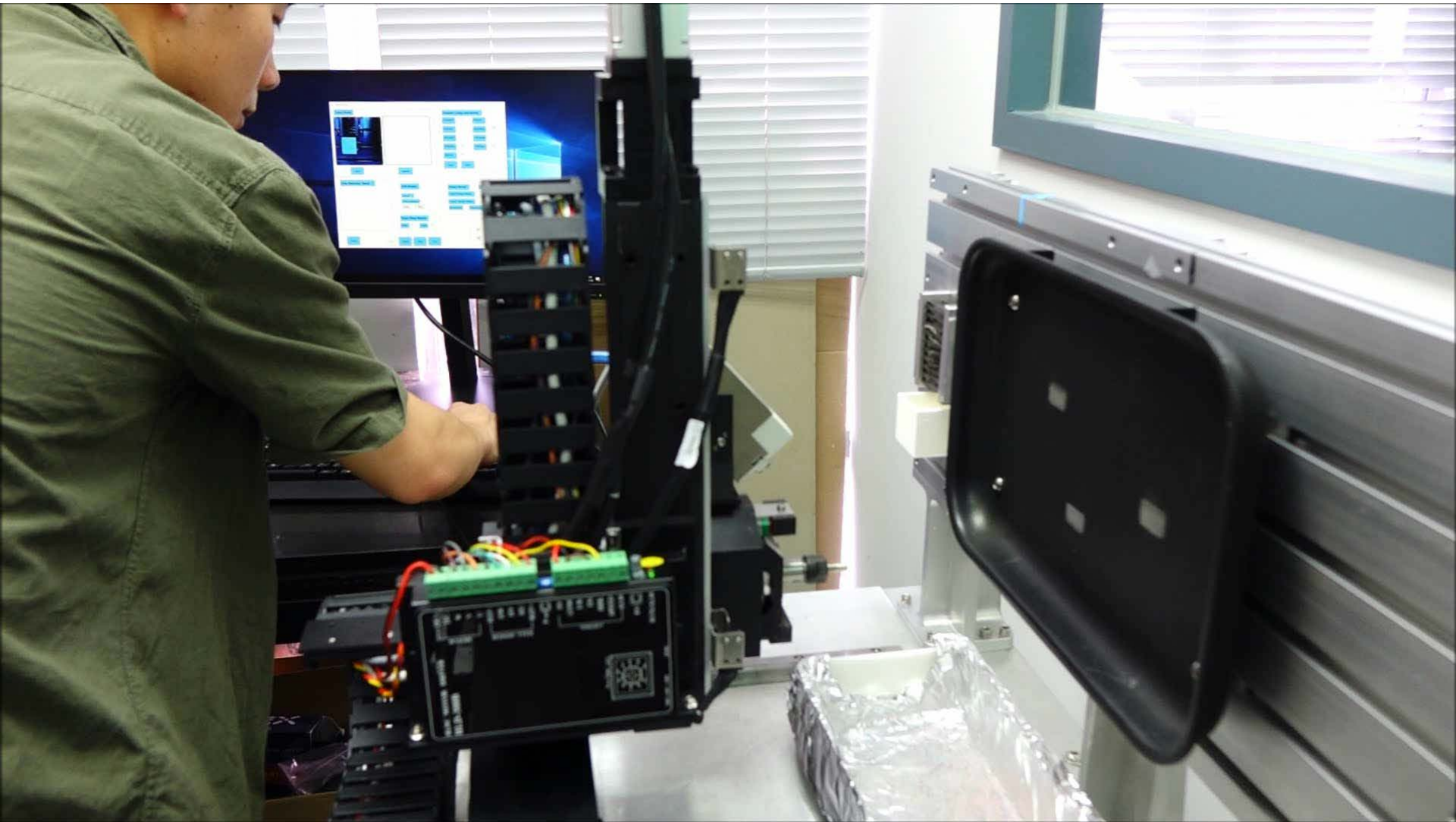
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AI, Robotics and Automation

Sample Preparation - Softlines



Sample Preparation - Hardlines



Resource availability monitoring system can handle video images and turn visual contents into trolley quantity



鏡頭辨識點算 發警告提示數量 中大助研發系統調配手推車



1 膠欄大堂裝 18 鏡頭
中大在 2014 年 10 月，在機場行李大堂安裝了 18 個攝影鏡頭，監察行李車使用情況。中大與香港機場管理局合作，將攝影鏡頭與中大研發的系統連接，以顯示行李車數量，並發出警告提示，提醒員工調配行李車。

2 自動攝像機私屋
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【香港訊】香港國際機場去年旅客量達 4500 萬人次，不少旅客入關時都會使用行李手推車，但人手不足，經常造成行李車數量不足，影響旅客使用。中大與香港機場管理局合作，將攝影鏡頭與中大研發的系統連接，以顯示行李車數量，並發出警告提示，提醒員工調配行李車。

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中大開發機場 AI 調配行李車
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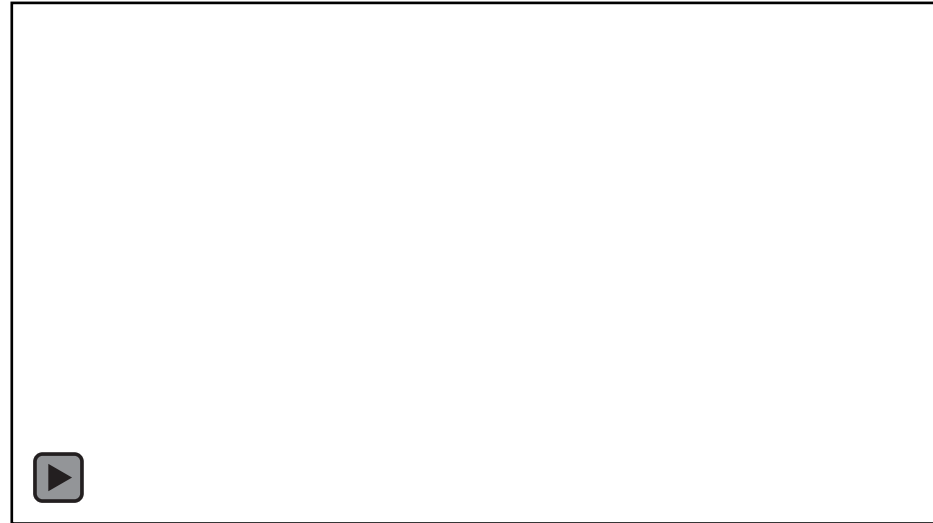
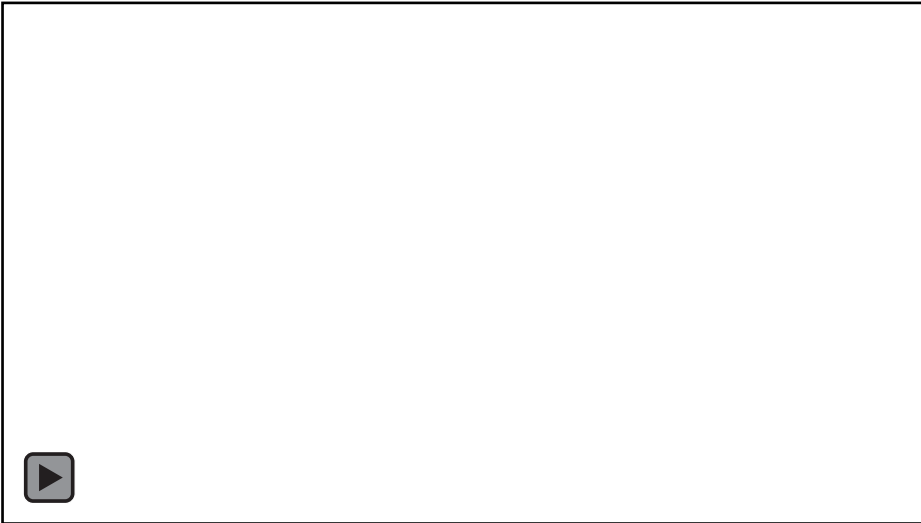
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Robot Arm - Capacitor Pick & Place



Computer Trained Robotic Vision System

Multiple Autonomous Guided Vehicles (AGV) in Warehouse



Multi-AGV Coordination



Human-AGV collaboration

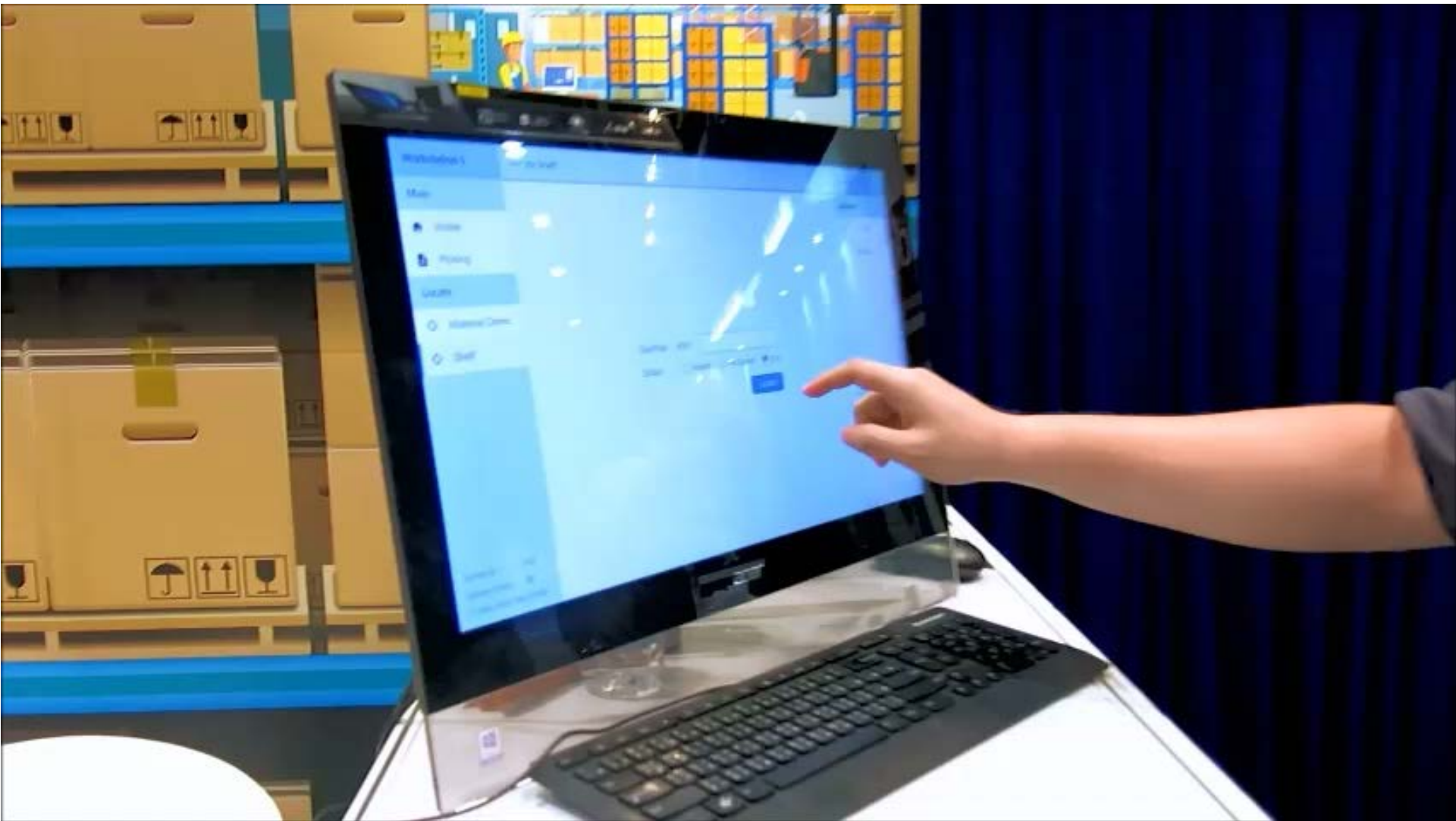


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Human-following Robot And Platooning



Warehouse Operations With The Use of Robotics



Robots Collaboration





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Inspection Service Logging

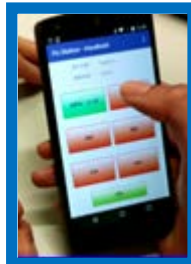
Inspection Service Logging – Process Automation

Process Transformation with Automated Service Logging

- Remote/ onsite inspection schedule will be pushed to staff's mobile apps



- All data will be sent to the inspection apps
- No more paper-based work is required



- Integrated with backend system via middleware



Reporting

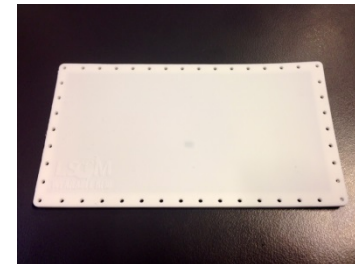
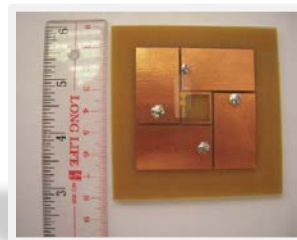
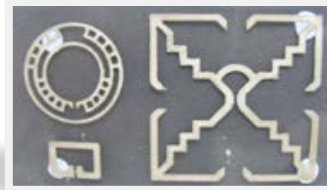




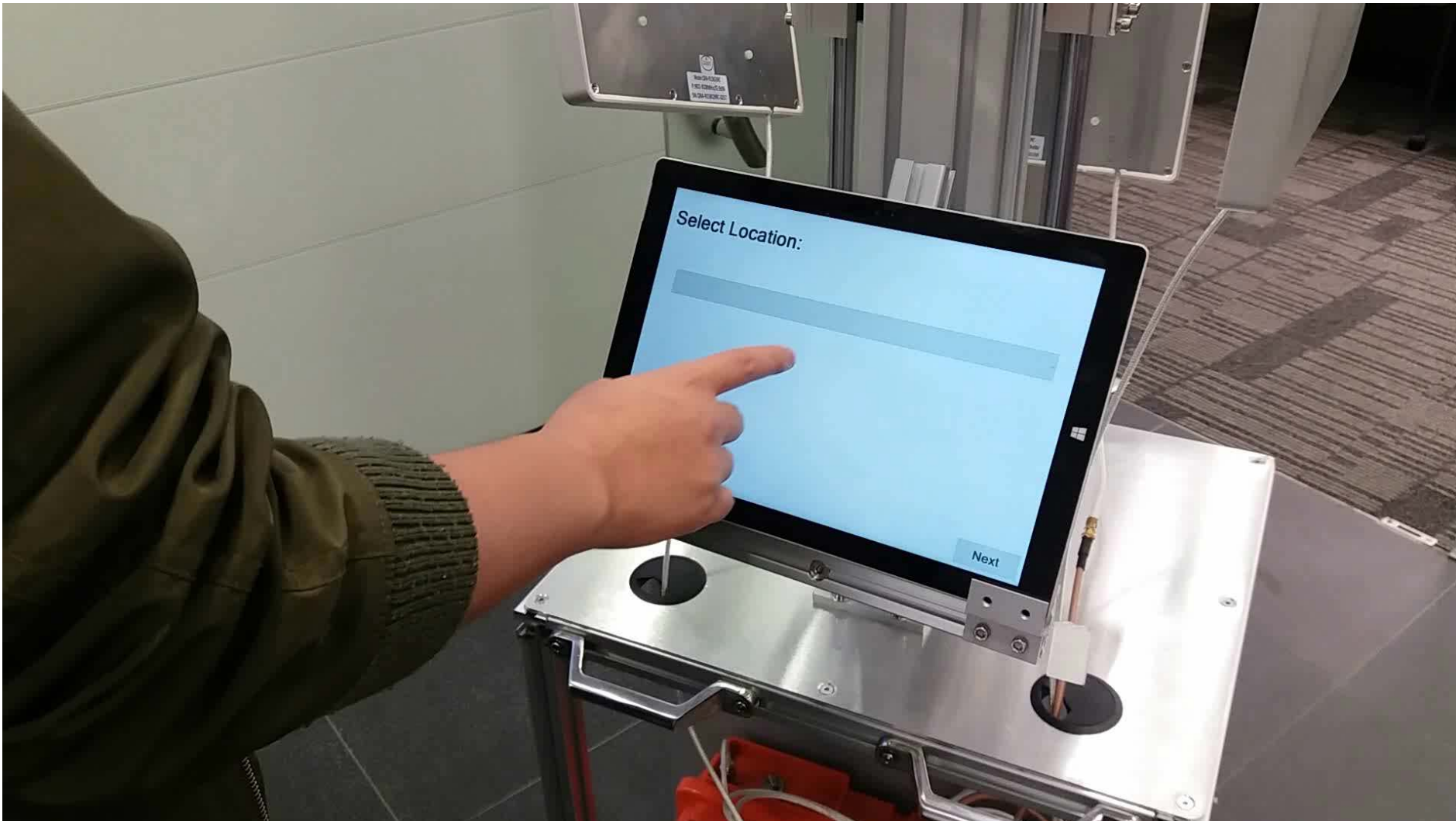
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RFID

Various type of RFID antennas designed by LSCM



RFID Stock Taking System





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Thank You