ECE 5990

Note 12
RFID Application Showcase

Edwin C. Kan

School of Electrical and Computer Engineering

Cornell University

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Outline

- Smart shelf
- Authentication for valuables
- Wildlife tracking
- Gesture recognition and motion tracking

Business Application Outlook

- Market size (direct sales vs. value added)
- Cost structure (fixed vs. variables)
- Technology readiness (present uniqueness and major challenges)
- Competition analysis (similar and alternative technology)

The Smart Shelf of Logistics

In today's retail, the price is competitive and proprietary !
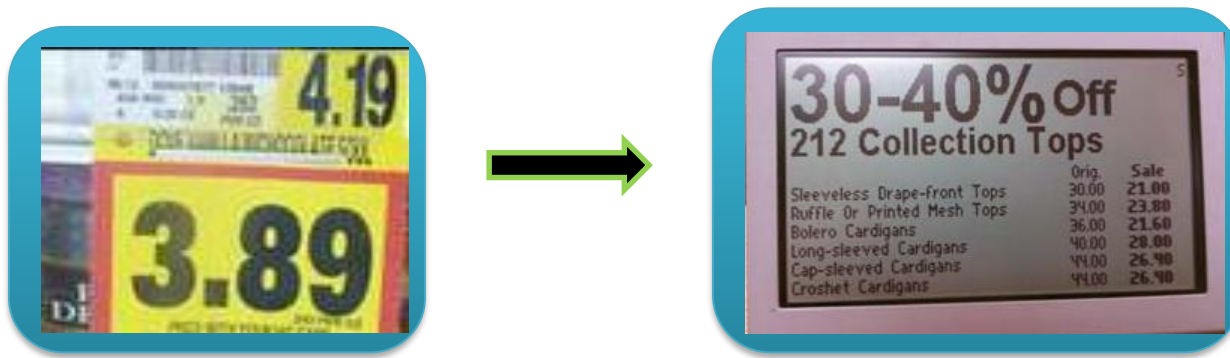
Digital price tags with RFID enable instant price update multiple times a day.

Improve the Shopper Experience

SHOPPERS MAKE THE RETAIL EXPERIENCE PERSONAL WITH THEIR SMART PHONES, AND WITH MOBILE SOLUTIONS, **RETAILERS CAN PERSONALIZE THE EXPERIENCE** AND INSPIRE LIKE NEVER BEFORE.

55.6% OF RETAIL STORES WILL PROVIDE WIRELESS GUEST ACCESS WITHIN 5 YEARS[1].

Reference: Motorola

Indoor Navigation for Shoppers

1) NAPKINS
2) SOAP
3) MEDICINE
4) TOWELS
5) COFFEE
6) BREAD

43% OF SHOPPERS
WANT THEIR SHOPPING LIST TO BE ORGANIZED
IN A CONVENIENT MAP[2]

Reference: Motorola

Locating by landmark tags

Logistic Market Analysis

- **Top 10 technology trend according to Gartner Research**

- **RFID global market in 2012 is US$5.3b, projected to be US$25b in 2015** → **double digit growth rate**

- **A major thrust of the technology initiative in China's 12th FYP**

Total RFID Market: Revenue Forecasts (World), 2006-2016
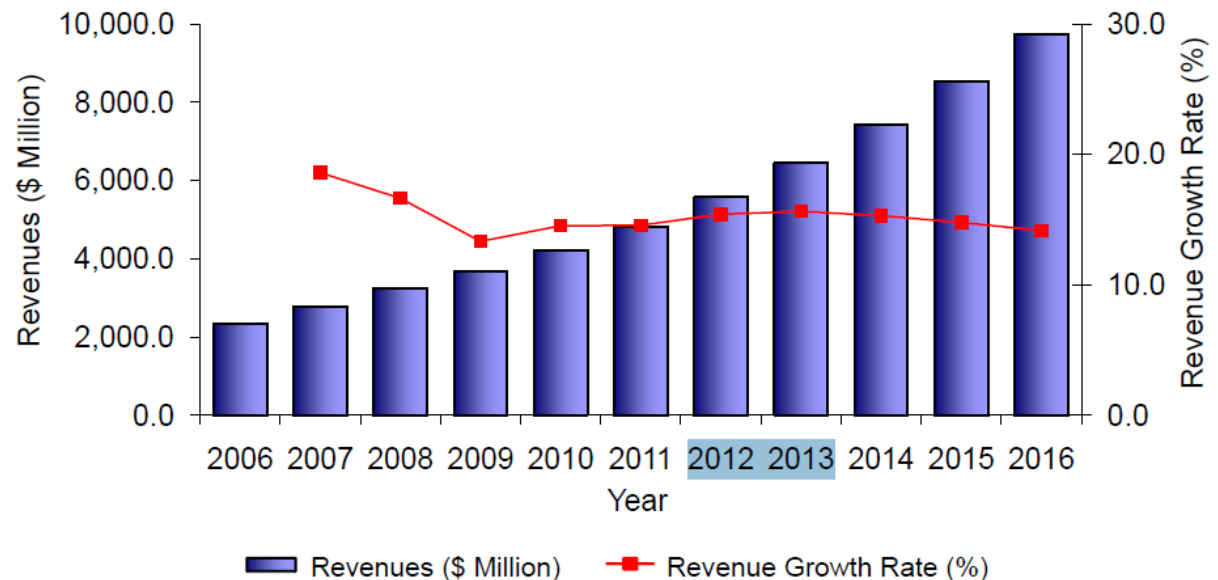
Note: All figures are rounded; the base year is 2009. Source: Frost & Sullivan

Factory and Point-of-Sales Logistics

- Market size
  - direct sales
  - value added
- Cost structure (fixed vs. variables)
- Technology readiness
  - present unique technology advantage
  - major challenges
- Competition analysis
  - products by Impinj and Alien
 - alternative technology: bar code; imaging

Factory and Point-of-Sales Logistics

- Market size
  - direct sales: present: $2B; potential: $8B
  - value added: factory management; PoS experience
- Cost structure: fixed: low; variable: low
- Technology readiness
  - UHF tags available
  - applet development on smart-phone readers
- Competition analysis
  - products by Impinj and Alien: UHF readers
  - alternative technology: 2D bar codes; customer camera

Authentication for Valuables

In today's retail, the EXPERIENCE is everything!
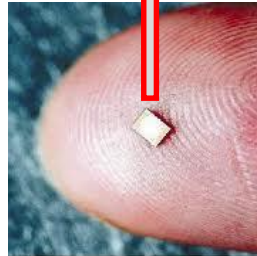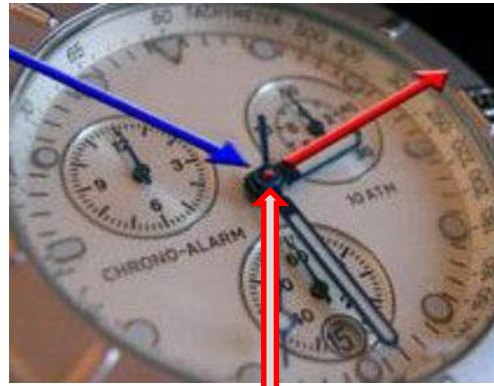
Authentication for Valuables

Authentication for Pay Systems

Personal and Valuable Identification

- Market size
  - direct sales
  - value added
- Cost structure (fixed vs. variables)
- Technology readiness
  - present unique technology advantage
  - major challenges: security and reliability
- Competition analysis
  - products by Impinj and Alien
  - alternative technology: bar code; imaging

Wildlife Tracking: NFC

Wildlife Tracking: UHF

Wildlife Tracking

- Market size
  - direct sales
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  - major challenges
- Competition analysis
  - products by Impinj and Alien
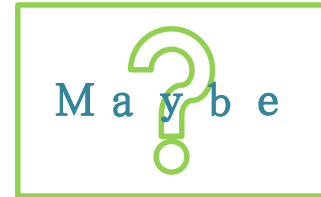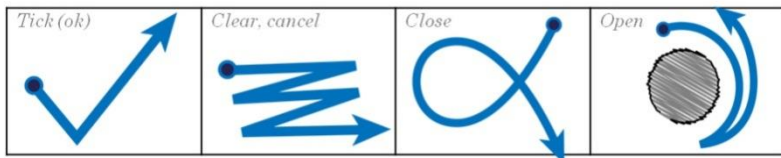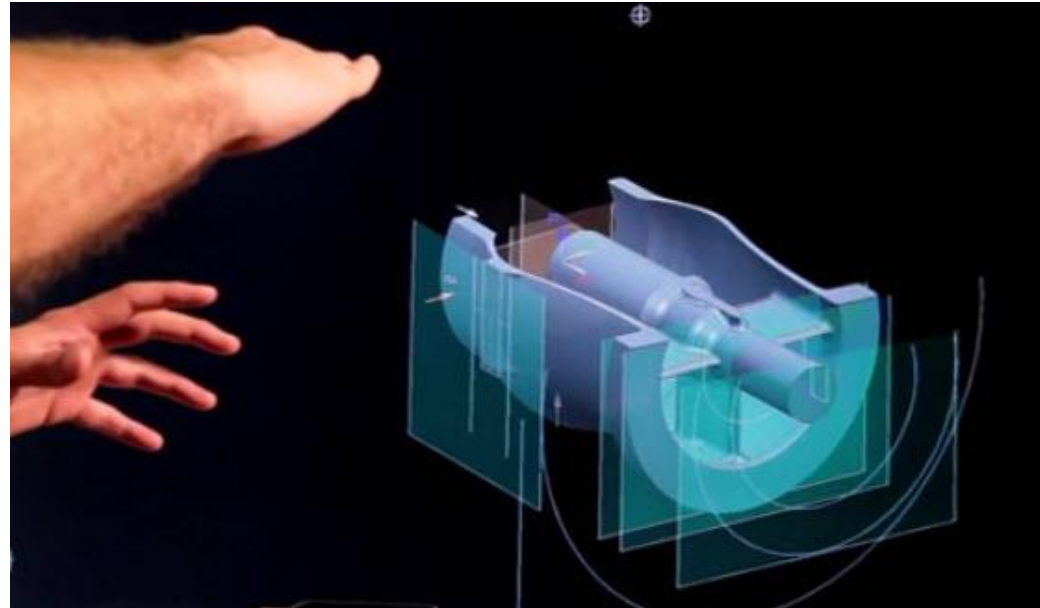 - alternative technology: bar code; imaging

Human Machine Interface

Left click,
right click

Fly wheel

USB Receiver

USB Plug

3D Display

or that ? Maybe ?

like this ? NO

Gesture Recognition

Pen

Tick (ok)　Clear, cancel　Close　Open

Ring

Personalized Remote Control

Key

RF sensor micrograph

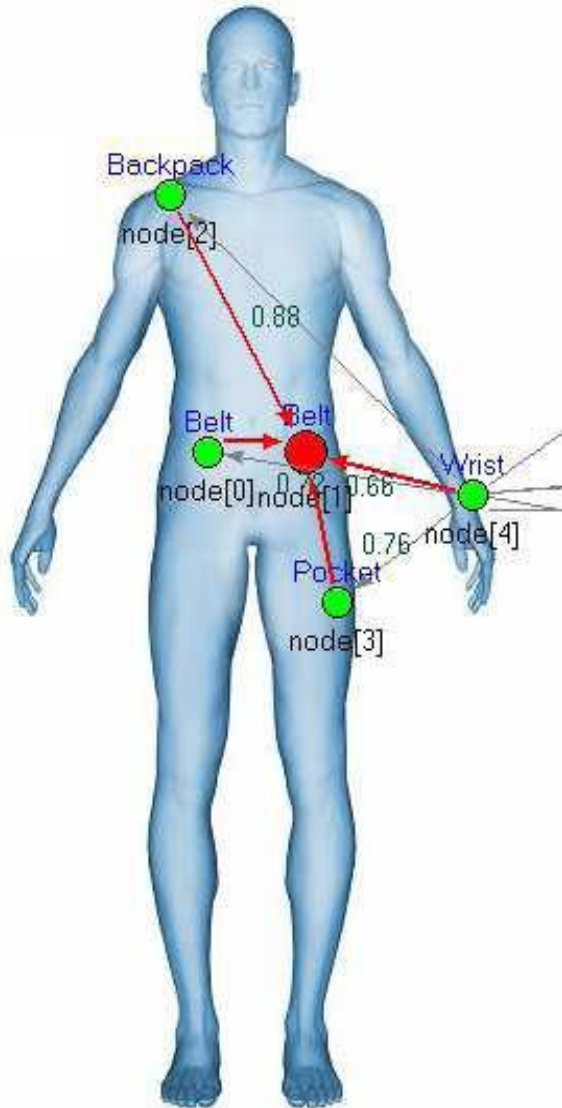| Tick (ok)	Clear, cancel	Close	Open
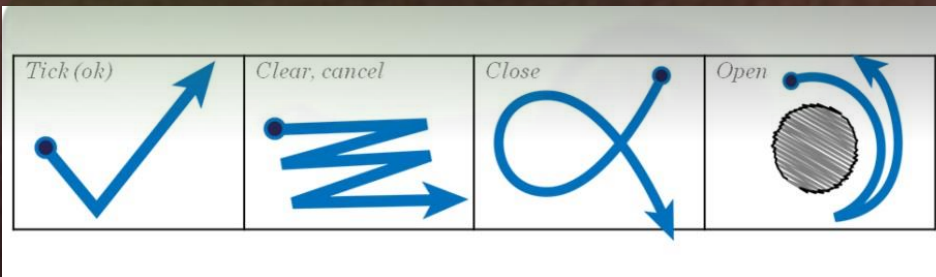
Robotics and Prosthesis
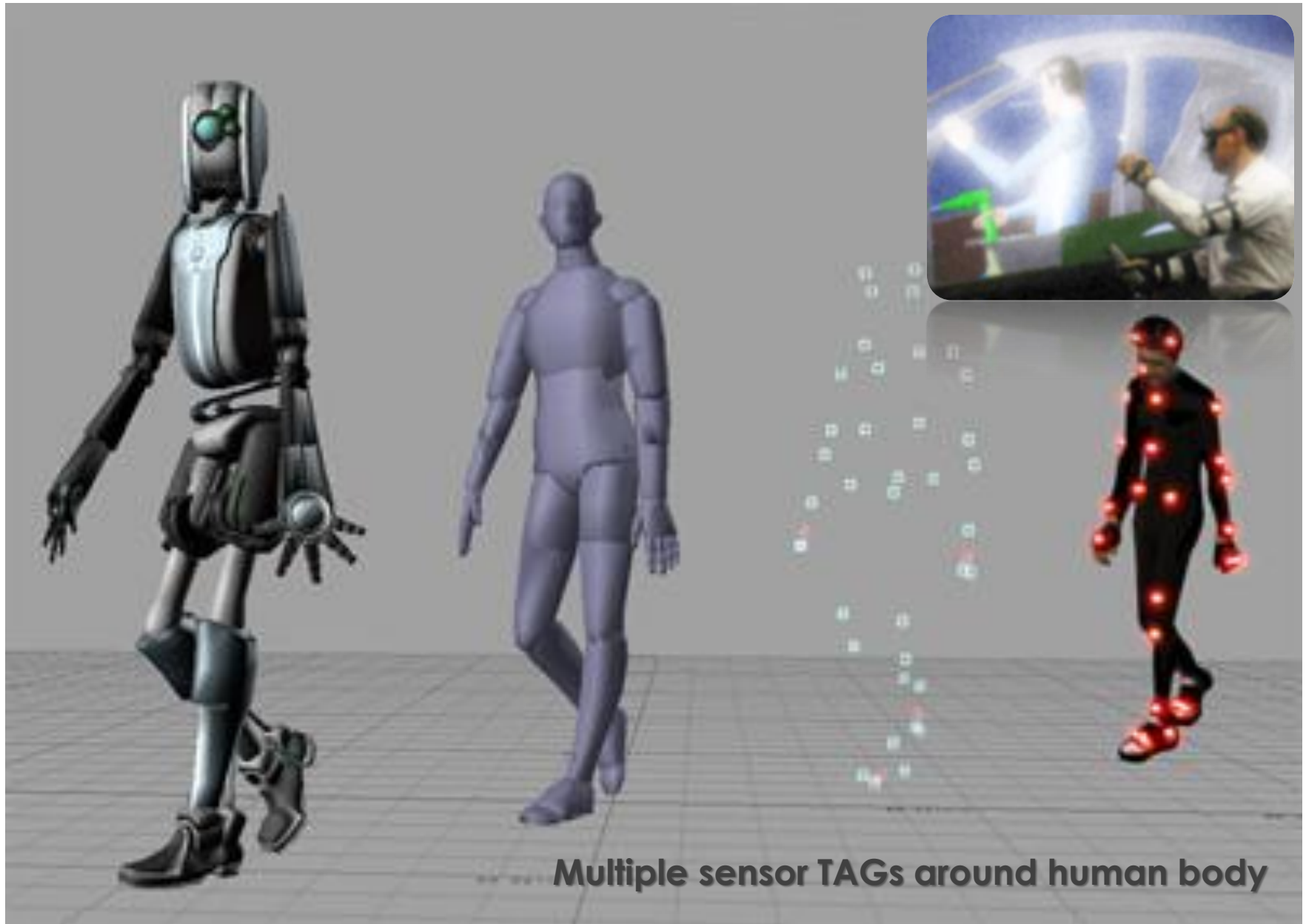
Multiple sensor TAGs around human body

Avatar in Real Life

Multiple sensor TAGs around human body

Fat Fingers and Noisy Ambient

3D Passive Tag Locating

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