Introduction to iuCSE
Research directions in WEI group

LIM lab/JAIST meeting, Oct.03 2012
By
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http://sites.google.com/site/quanletrung/

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- Introduction to IU/School of CSE

- Research directions in Wireless Embedded Internet (WEI) group

Introduction to International University

http://www.hcmiu.edu.vn

➢ *Established in 12/2003*

➢ *Research-oriented university*

    ➢ *Contribute to the development to Vietnam society, community and country*

➢ *Teaching with international standard*

➢ *All programs are taught by English*

➢ *Modern learning and research environment*

➢ *4 Schools and 6 Departments*

➢ *160 lecturers, 3500 students,*

➢ *500 twinning and exchange students*

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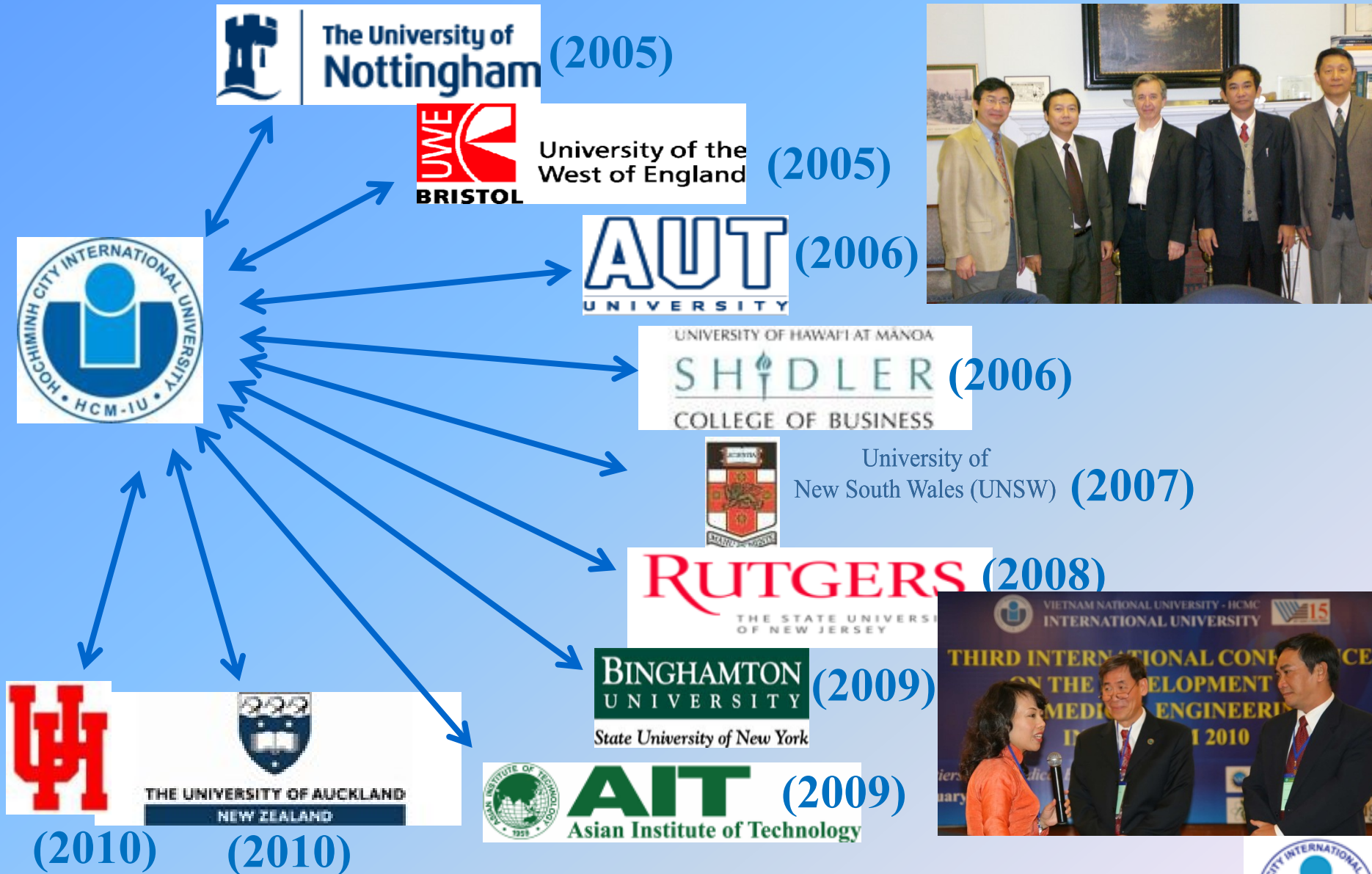
Introduction to IU

- 4 schools
  - School of BioTechnology
  - School of Business
  - **<u>School of Computer Science & Engineering</u>**
  - School of Electrical Engineering
- 6 departments
  - Dept. of Biomedical Engineering
  - Dept. of Civil Engineering
  - Dept. of English
  - Dept. of Industrial and Systems Engineering
  - Dept. of Mathematics
  - Dept. of Physics

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INTERNATIONAL COLLABORATION

The University of Nottingham **(2005)**

UWE BRISTOL — University of the West of England **(2005)**

AUT UNIVERSITY **(2006)**

UNIVERSITY OF HAWAI'I AT MĀNOA
SHIDLER COLLEGE OF BUSINESS **(2006)**

University of New South Wales (UNSW) **(2007)**

RUTGERS THE STATE UNIVERSITY OF NEW JERSEY **(2008)**

BINGHAMTON UNIVERSITY
State University of New York **(2009)**

AIT Asian Institute of Technology **(2009)**

UH **(2010)**

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND **(2010)**

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Some Activities

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Established in 2004

DEGREES

- Under-Graduate
    - Bachelor of Computer Science
    - Bachelor of Computer Engineering
        - Networking
        - Computer Engineering
    - Student admission: 60-80 annually
- Graduate
    - Master of Information Technology Management
        - Student admission: 40 annually
    - Doctor degree (in-progress…)

School of CSE

- There are two types of degrees
  - Issued by the International University (for the domestic programs) – 4 years
  - Issued by the partner university (for twinning programs) – 2+2 years
    - Rutgers, the State University of New Jersey – USA
      - http://www.rutgers.edu
    - The University of Nottingham
      - http://www.nottingham.ac.uk
    - Binghamton University (New York)
      - http://www.binghamton.edu
    - The University of New South Wales
      - http://www.unsw.edu.au
    - …

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School of Computer Science and Engineering

- 16 lecturers (PhD/MSc, graduated from overseas universities, 3 foreigners)

- Research directions:

  - User Modeling & Social Computing
  - Data Mining, Business Intelligence
  - Cloud Computing
  - P2P Network
  - System and Network Security
  - **Wireless Embedded Internet (WEI)**

Research directions in WEI group

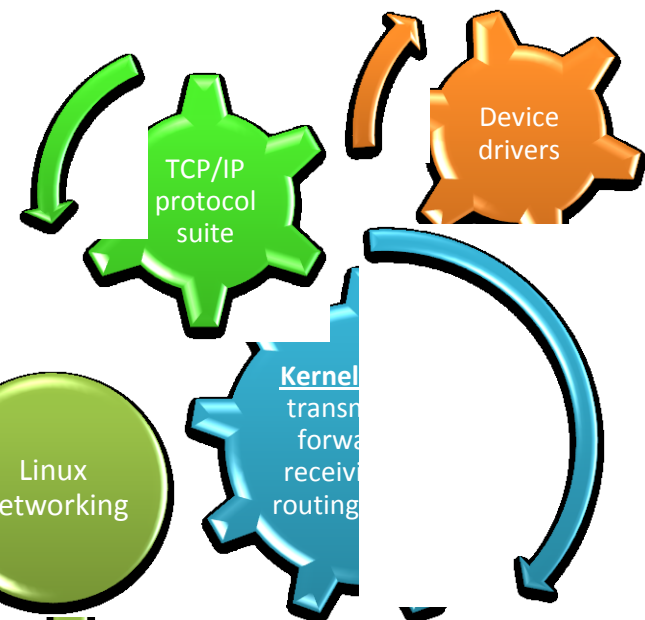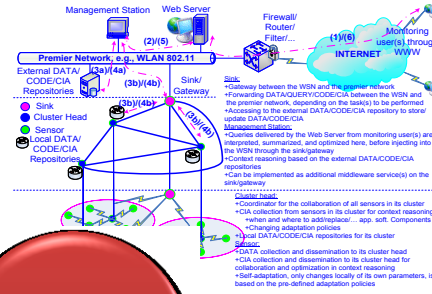http://sites.google.com/site/quanletrung/wireless-embedded-internet-research-group

- **Wireless (self-organized) networking**
  - Mobile ad-hoc, sensor-actuator, mesh, wlan, etc
  - Routing, addressing, internetworking, reconfiguration, etc
  - Examination of wireless standards (microIP/IPv6, 6LoWPAN, 802.15.4/ZigBee, IETF ROLL/6LowApp, IPSO Alliance, etc)
  - Applications of these wireless technologies in environment monitoring, smart houses, fire alarming, etc
  - Development of wireless devices (e.g., ad-hoc routers, sensor nodes)
- **Linux networking**
  - Linux kernel networking (packet forwarding, routing updates)
  - Device drivers (for WLAN cards)
- **Embedded systems**
  - Sensors, RFIDs, smart phones, wireless cards
  - Systems-on-chip (Atmel, ARM processors)
  - Applications
- **Internet protocols and architectures**
  - Integration, Internetworking

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Wireless Self-Organized Networks

802.11.x, 802.15.x, 802.16.x
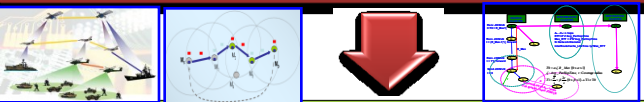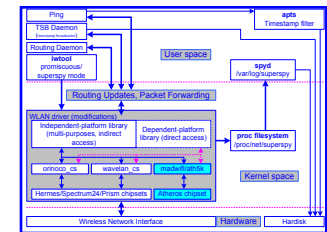
(mobile, ad-hoc, sensor-actuator, mesh)

Routing, Addressing, Internetworking
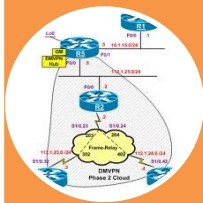
Traffic Management, Congestion Control, Load-Ba...

Mobility Management, Application Developme...

Device drivers

TCP/IP protocol suite

Kernel transm... forwa... receivi... routing...

Wireless Networking

Linux Networking

Networking:

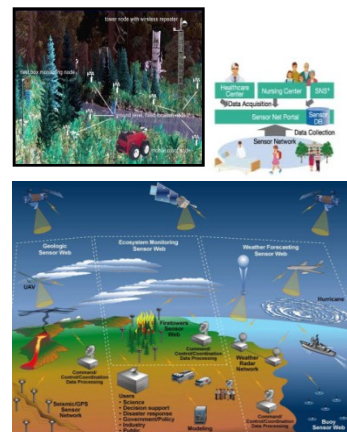Linux-based Wireless Embedded Internet

Internet

Embedded Systems
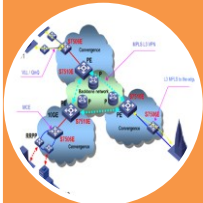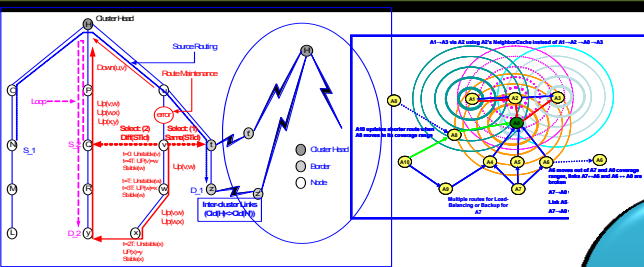
Core Internet architectures: MPLS, G-MPLS, IPv4/IPv6, ATM, SONET/SDH

Routing & Internetworking: RIP, OSPF, BGP

Traffic management & Congestion Control

Network management
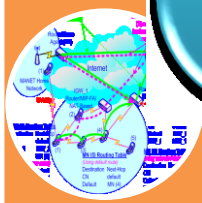
Mobility Management: MIPv4/v6, HMIPv4/6, FMIPv4/6, FHMIPv4/6, PMIPv4/6, NEMO, 802.21

Internet

Device drivers
- Sensors, RFIDs, smart phones
- Wireless cards

Tiny operating systems
- TinyOS, Contiki, Linux
- Code distribution, re-programming
- Re-configuration, adaptation

Applications
- Monitoring (building, environment)
- Automation control
- Smart house, smart building, smart city

Wireless Embedded Internet

- **Research Topics and Projects**
  - **Wireless self-organized networks**
    - **JAIST/Japan** [in-progress]
    - **ManetPRO**, funded by VNUHCM [2012-2014]
    - **SWISNET**, funded by Norway Research Council [2008-2010]
    - **CRUISE**, funded by Europe FP6 ICT [2006-2007]
  - **Internet architecture and network protocols**
    - **EuroNGI/FGI**, funded by Europe FP6 ICT NoE [2004-2008]
    - **Optical Ring Backbone Networks**, funded by VNUHCM [2004]
    - **ATM networks**, funded by HCMUT [2000]
  - **Embedded systems**
    - **ManetPRO**, funded by VNUHCM [2012-2014]
    - **CatFishMng**, funded by VASEP/Vietnam [2010-2011]
    - **CarSys**, funded by PowellTechWings/Korea [2007-2009]
    - **VODAS**, funded by MoohaDigital/Korea [2005-2006]
  - **Linux networking**
    - **ManetPRO**, funded by VNUHCM [2012-2014]

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# ManetPRO: A Protocol Evaluation Testbed over m-platforms [VNUHCM, 2012-2014]
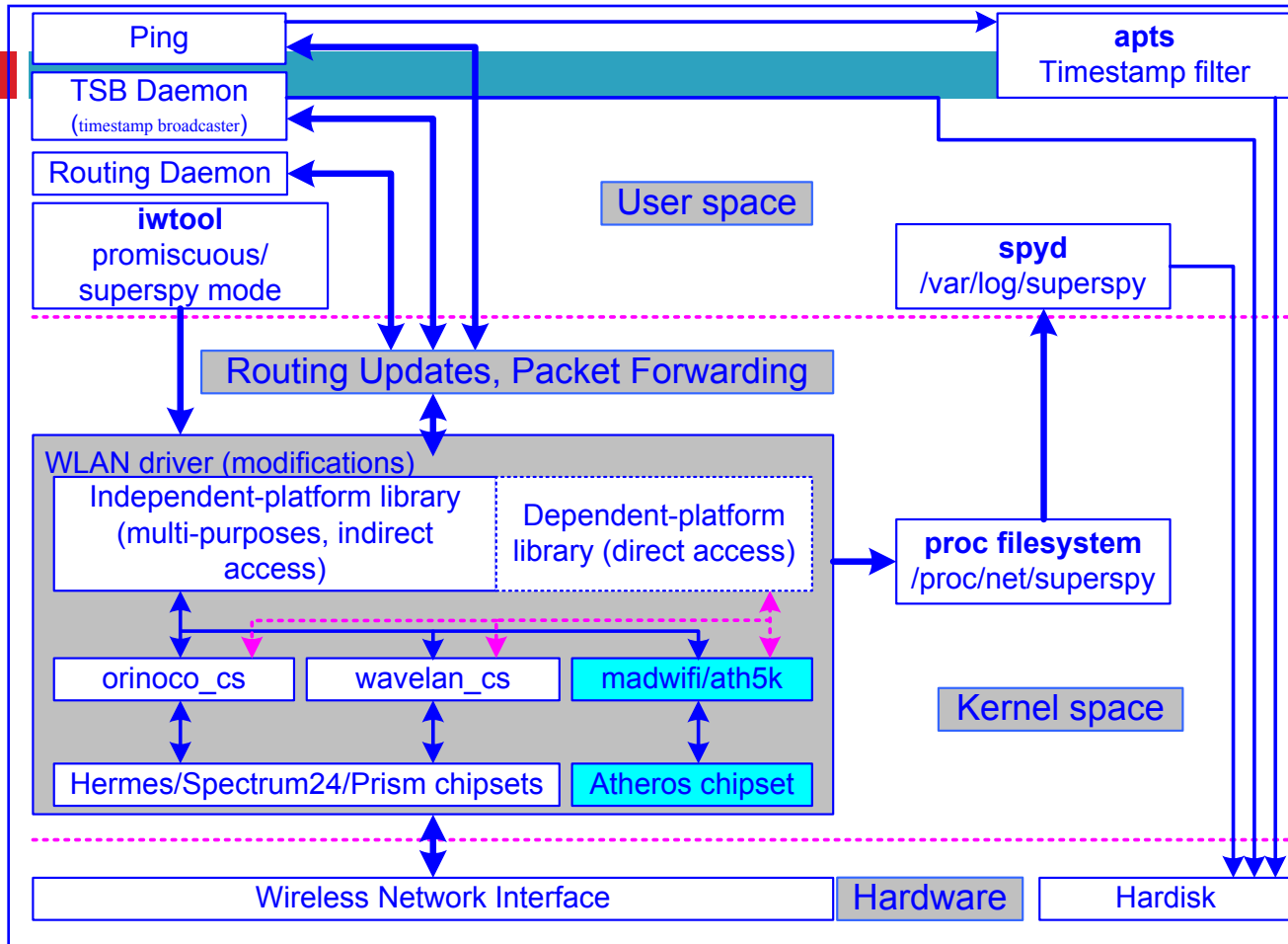
Embedded Systems Projects

❑Application Development for IP Settop Box, 4-channel video card for VODAS System
❑EM8622L, Sigma Designs
❑www.moohadigital.com
❑Korea, 2005-2006

❑Application Development for CarSys Device
❑ATmega128, Atmel
❑www.powelltw.com
❑Korea, 2007-2009

Red Fire   Black Jack   Blue Sky

Embedded Systems Projects

☐ Catfish management based on RFID
☐ S3C6410, Samsung
☐ http://www.vasep.com.vn
☐ Vietnam, 2010 - 2011
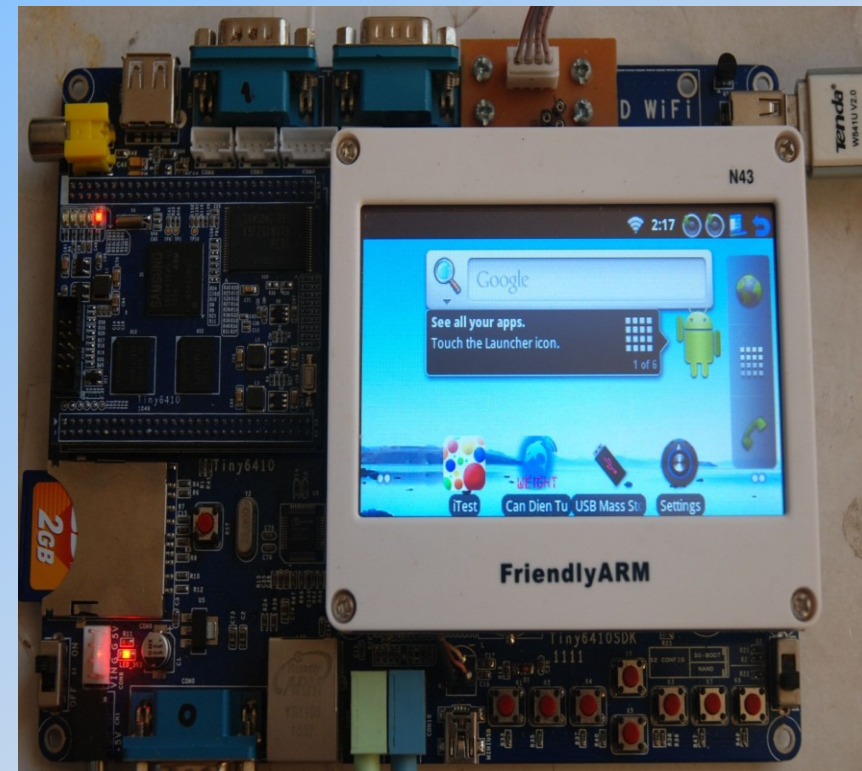
On-Negotiation Projects – VNUHCM fund

□ Digital Door-Lock

□ Book management based on UHF RFID for Library
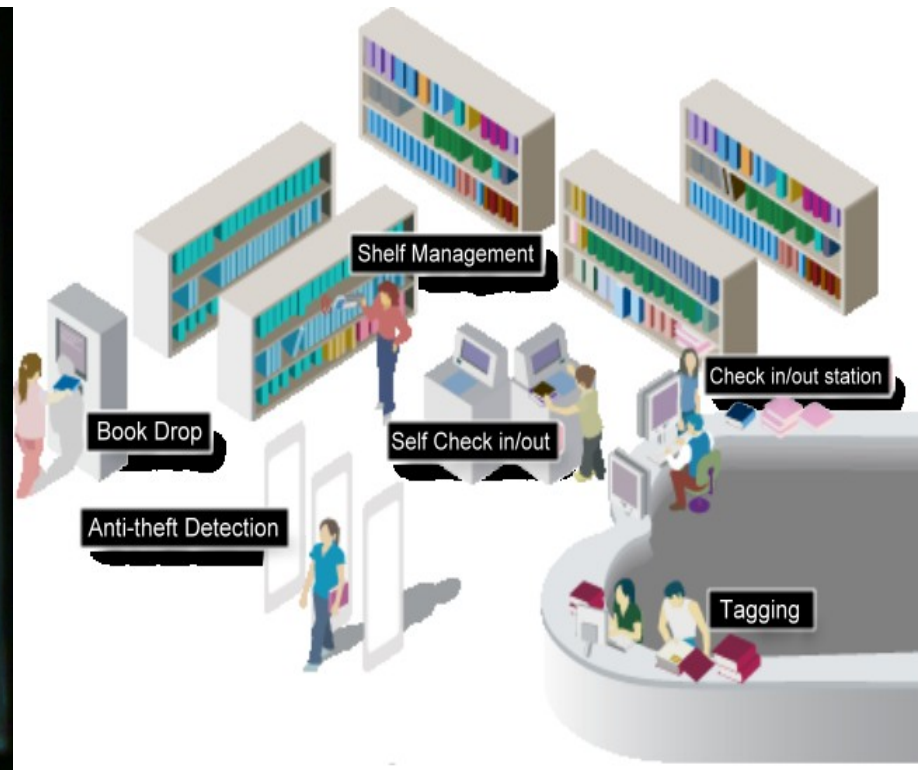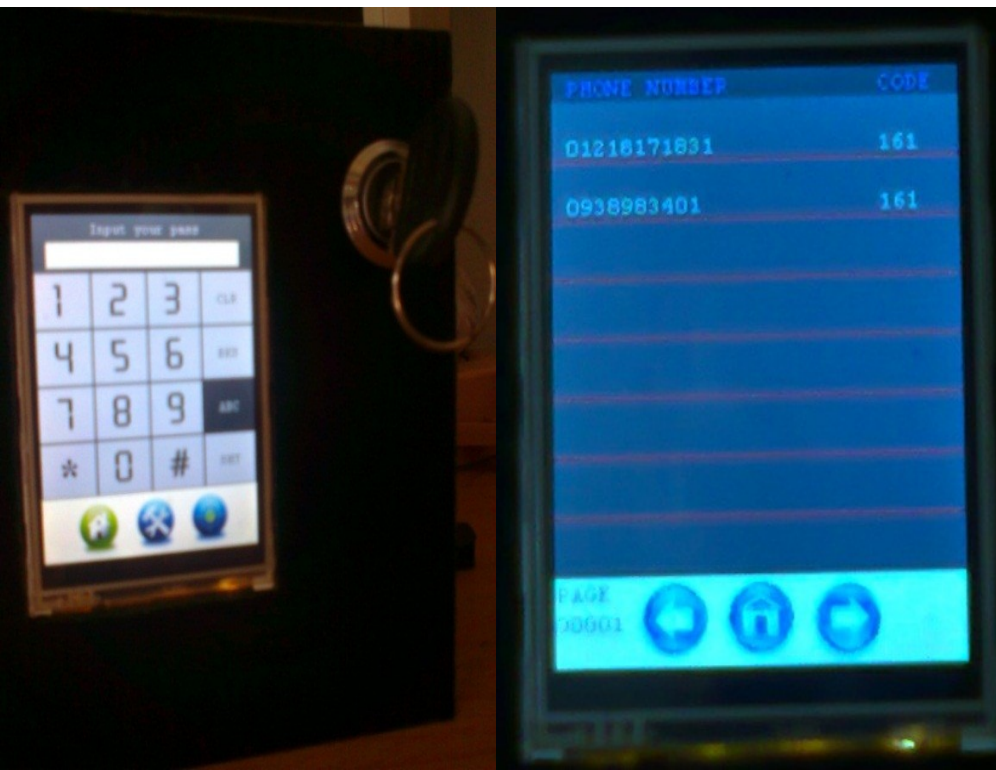
Wireless Embedded Internet group

- **Members of groups**
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    - sonhardware@gmail.com, nmson@hcmiu.edu.vn
  - Tu-Nga Ly, M.Eng.
  - Son-Hai Ha, Master student
  - Undergraduate/Graduate students
    - Doing Pre-Thesis/Thesis

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List of Devices in Wireless Embedded Internet Lab

No	Equipment/Model	Manufacturer	Quantity
1	Server RoHS-5 Sunfire V240.2*1.5Ghz	Sun Microsystems	1
2	Server HPCluster DL 380	HP	1
3	Soft ware HP aC++LTU for servers	HP	1
4	Cisco Switch 12 port/Power cord U	Cisco	5
5	Cisco Switch 24 port/Power cord U	Cisco	5
6	Cisco Router 2801W/AC/2 port/16 p	Cisco	6
7	Servers SunfireX4200server	Sun Microsystems	3
8	Internet Server Sunfire V240 Server	Sun Microsystems	2
9	Computing ServerSunfire V890 serv	Sun Microsystems	1
10	UX Server Sunfire V490 server	Sun Microsystems	1
11	Backup Tape Sun Storage TekC4	Sun Microsystems	1
12	Storage area network(SAN) System	HP	1
13	Backup Server Sunfire V240	Sun Microsystems	1
14	Backup Software Net Backup 6.0	HP	1
15	Switch Cisco WS-C6509/catalyst	Cisco	1
16	Check point VPN-1Pro		1
17	Cisco Switch 24-10/100 WS	Cisco	2
18	Cisco Switch 48-10/100 WS	Cisco	3
19	Cisco Router 7206VXR	Cisco	1
21	Computer set, Mainboard Intel BOXDG41RQ, CPU Duo core E5400, DDRII	HP	30

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