



Computer Engineering Group

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Field of study: Mobile Application/System Design, Green and Orange Technology Integration

Key words: Mobile Application/System,

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1. The Subjects and Aims of Research

1. Mobile Application/System Design: Focus on the challenges of designing mobile services and system architectures.
2. Multidisciplinary Integration: Focus on the integration of Green or Orange technologies.

2. Recent Research Topics

(a) Mobile Application/System Design:

Thanks to the advancement of wireless technology, mobile services increasingly catch more attention in the post era of the booming voice service. A typical mobile wireless service comprises three parts: services, user devices and networks. Creating mobile broadband services over heterogeneous bearers may face the problem about a great diversity of combinations in service flows. We focus on the challenges about designing mobile services and architectures.

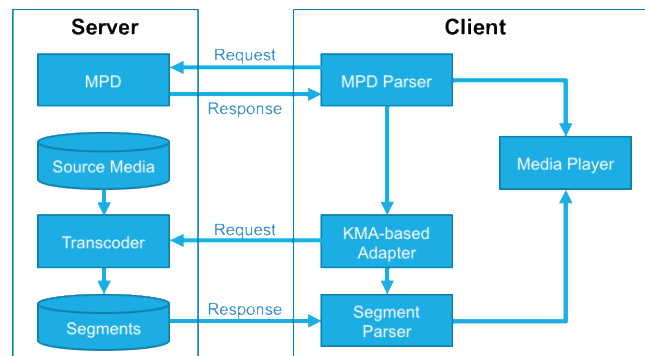


Fig. 1 Mobile Service Architecture (Take KMA-based DASH as an example)

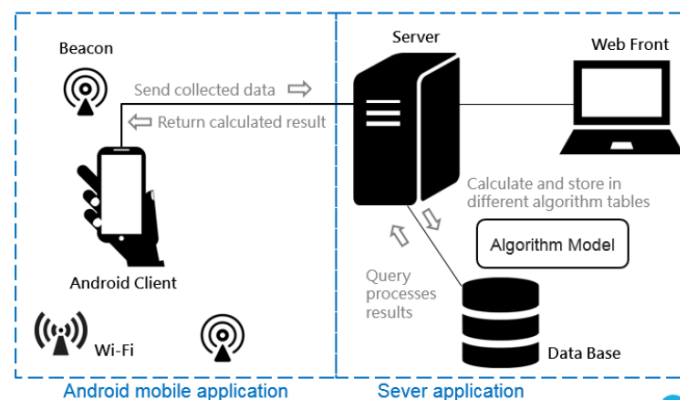


Fig. 2 Indoor Positioning System

(b) Multidisciplinary Integration (especially for Orange Technology):

How to get elderly people freely enjoy their lives in the information age has become an important issue. With humanitarian concern, we exploit the cutting-edge sensing and communication technologies to improve the life quality of the elderly.

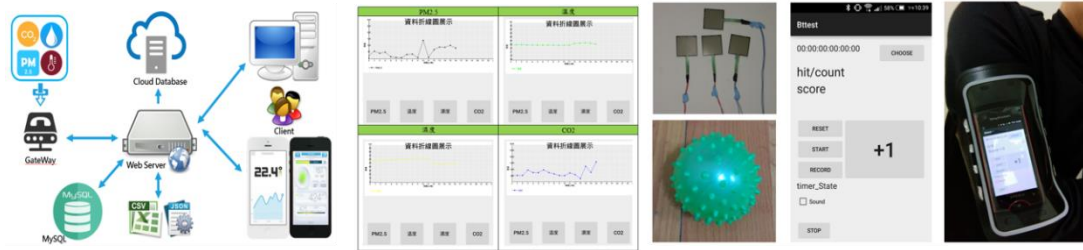


Fig. 3 Family Care System Integration



Fig. 4 Smart Assistive Design

3. Selected Publications and Projects(2011-2015)

A. Journal Papers (Selected)

- 1) Jenq-Shiou Leu, Min-Chieh Yu, Hung-Jie Tzeng, “Improving Indoor Positioning Precision by Using Received Signal Strength Fingerprint and Footprint Based on Weighted Ambient Wi-Fi Signals,” *Computer Networks*, Vol. 91, pp. 329-340, Nov. 2015 [SCIEI] (IF(2014): 1.256, COMPUTER SCIENCE, HARDWARE & ARCHITECTURE (18/50))
- 2) Jenq-Shiou Leu, Jheng-Huei Chen, and Kuen-Han Li, “Hybrid Search Scheme for Social Networks Supported by Dynamic Weighted Distributed Label Clustering,” *IEEE Transactions on Computers*, Vol. 64, No. 9, pp. 2586-2594, Sep. 2015 [SCI,EI] (IF(2014): 1.659, COMPUTER SCIENCE, HARDWARE & ARCHITECTURE (10/50))
- 3) Jenq-Shiou Leu, Tung-Hung Chiang, Min-Chieh Yu, and Kwan-Wu Su, “Energy Efficient Clustering Scheme for Wireless Sensor Networks with Isolated Nodes,” *IEEE Communications Letters*, Vol. 19, Issue 2, pp. 259-262, Feb. 2015 [SCI,EI] (IF(2014):1.268, TELECOMMUNICATIONS(31/77))
- 4) Jenq-Shiou Leu, Chi-Feng Chen, and Kun-Che Hsu, “Improving Heterogeneous SOA-based IoT Message Stability by Shortest Processing Time Scheduling,” *IEEE Transactions on Services Computing*, Vol. 7, No. 4, pp. 575-585, Oct. 2014 [SCI,EI] (IF(2014): 3.049, COMPUTER SCIENCE, SOFTWARE ENGINEERING (3/104))
- 5) Jenq-Shiou Leu, Nguyen Hai Tung, and Chun-Yao Liu, “Non-parametric RSS Prediction Based Energy Saving Scheme for Moving Smartphones,” *IEEE Transactions on Computers*, Vol. 63, Issue 7, pp. 1793-1801, Jul. 2014 [SCI,EI] (IF(2013): 1.473, COMPUTER SCIENCE, HARDWARE & ARCHITECTURE (15/50))
- 6) Mu-Sheng Lin, Jenq-Shiou Leu, Kuen-Han Li, and Jean-Lien Chen Wu,

“TABOA: Terrain-Aware Beacon Order Adaptation Scheme in 3D Zigbee Sensor Networks,” IEEE Wireless Communications, Vol. 20, Issue 2, pp. 28-36, Apr. 2013 [SCI,EI] (IF(2012): 3.740, TELECOMMUNICATIONS (2/77)) (NSC- 100-2221-E-011-154-)

- 7) Min-Chieh Yu, Jenq-Shiou Leu, “Kernel Weighted Scheme for Improving Mobile Sensor Node Connectivity,” IEEE Sensors Journal, Vol. 13, No. 4, pp. 1200-1206, Apr. 2013 [SCI,EI] (IF(2012): 1.475, INSTRUMENTS & INSTRUMENTATION (20/57)) (NSC- 101-2221-E-011-126-)
- 8) Jenq-Shiou Leu, Chuan-Ken Lin, “On Utilization Efficiency of Backbone Bandwidth for a Heterogeneous Wireless Network Operator,” ACM/Springer Wireless Networks (WINET), Vol.17, No.7, pp. 1595-1604, Oct. 2011 [SCI,EI] (IF(2011): 0.520, TELECOMMUNICATIONS (56/79))

B. Conference Papers(Selected)

- 1) M.-Y. Wu, M.-C. Yu, J.-S. Leu, and S.-K. Chen, “Improving Security and Privacy of Images on Cloud Storage by Histogram Shifting and Secret Sharing,” The 83th IEEE Vehicular Technology Conference (IEEE VTC 2016 Spring), Nanjing, China, May 15–18, 2016
- 2) T.-H. Chiang and J.-S. Leu, “Regional Energy Aware Clustering with Isolated Nodes in Wireless Sensor Networks,” 2014 IEEE 25th International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC 2014), pp. 1829-1833, Washington DC, USA, Sep. 2-5, 2014.
- 3) J.-S. Leu, C.-T. Chen and T.-H. Chiang, “Prolonging WSN Lifetime with Data-Location Similarity and Weakest Node Protection,” The 79th IEEE Vehicular Technology Conference (IEEE VTC 2014 Spring), pp. 1-5, Seoul, Korea, May 18-21, 2014
- 4) W.-B. Hsieh and J.-S. Leu, "A Dynamic Identity User Authentication Scheme in Wireless Sensor Networks," 9th IEEE International Wireless Communications and Mobile Computing Conference (IEEE IWCMC 2013), pp. 1132-1137, Cagliari, Sardinia, Italy, Jul. 1-5, 2013.
- 5) J.-S. Leu, K.-W. Su, T.-Y. Chu, C.-H. Hsieh, Y.-S. A. Chen, and J. P. Ma, "Pointer Wizard - A Remote Interaction User Interface," The 11th ACM Annual International Conference on Mobile Systems, Applications, and Services (ACM MobiSys 2013), pp. 477-478, Taipei, Taiwan, Jun. 25-28 2013.
- 6) J.-S. Leu and H.-J. Tzeng, "Received Signal Strength Fingerprint and Footprint Assisted Indoor Positioning Based on Ambient Wi-Fi Signals," The 75th IEEE Vehicular Technology Conference (IEEE VTC 2012 Spring), Yokohama, Japan, May 6-9, 2012.
- 7) M.-C. Yu and J.-S. Leu, "Adaptive Weighted Scheme for Improving Mobile Sensor Node Connectivity in the IEEE 802.15.4 Network," the 13th IEEE/IFIP Network Operations and Management Symposium (IEEE/IFIP NOMS 2012), pp. 968-973, Maui, Hawaii, USA, Apr. 16-20, 2012.

C. Projects

- 1) A wearable device evaluation for medication management in patients taking sleep medicine via cloud platform development(2/3)(Co-PI)(105-3011-E-038-001-)
- 2) Implementing an Interactive Family Care Platform by Using Streaming Analysis, Realistic authentication and Multimedia IoT(105-2221-E-011-084-MY3)

- 3) [TMU-NTUST Joint Research Project]System Development and Validation in Sleep Preparing Inferential Model
- 4) [Tokyo Institute of Technology & NTUST Joint Research Project] Study on gathering, processing, and analyzing big data from human centric IoT devices using Hadoop platform - for smart FamilyCare home applications
- 5) Integration Design and Implementation of Smart Home Assistive Devices for Elderly People(104-2218-E-011 -016 -)
- 6) Research on Secure Multimedia Delivery through the Over-The-Top Service Platform(104-2221-E-011-018-)
- 7) Development of Indoor Positioning and Navigation System [T-StarN]
- 8) Linux Optimization for HW Diagnostic FW[NetAPP]
- 9) Fast Duplicated Files Finder[QNAP]
- 10) Application Development on Cloud Storage System [QNAP]
- 11) Research, Design and Development of Human-Centric Context-Aware Computing System(103-2221-E-011-112-)
- 12) JiAngle: Care What You Care(103-2218-E-011 -005-)
- 13) Study on the self-learning model of power efficiency management on smartphone(102-2221-E-011-068-)
- 14) Pointer Wizard- Elderly People Centric Touchless Communication User Interface(101-2218-E-011-039)
- 15) Study on Network Coding Based File Sharing and Power Consumption on Mobile Nodes in a Heterogeneous P2P Network(101-2221-E-011-126-)