

Part II: Applications

1. Applications and the Spatial Attribute:

Tracking and Monitoring Applications

Monitoring Examples

1. Sen, R., Maurya, A., Raman, B., Mehta, R., Kalyanaraman, R., Vankadhara, N., ... & Sharma, P. (2012, November). Kyun queue: a sensor network system to monitor road traffic queues. In Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems (pp. 127-140). ACM.
2. Aslam, Javed, et al. "City-scale traffic estimation from a roving sensor network." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
3. Kannan, Pravein Govindan, et al. "Low cost crowd counting using audio tones." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
4. Martin, Paul, Zainul Charbiwala, and Mani Srivastava. "DoubleDip: leveraging thermoelectric harvesting for low power monitoring of sporadic water use." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
5. Wu, Xiaopei, and Mingyan Liu. "In-situ soil moisture sensing: measurement scheduling and estimation using compressive sensing." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
6. Lai, Ted Tsung-Te, et al. "TriopusNet: automating wireless sensor network deployment and replacement in pipeline monitoring." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
7. Ali, Amin Ahsan, et al. "mPuff: automated detection of cigarette smoking puffs from respiration measurements." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
8. Anthony, David, et al. "Sensing through the continent: towards monitoring migratory birds using cellular sensor networks." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
9. Liu, Guojin, et al. "Volcanic earthquake timing using wireless sensor networks." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
10. Srinivasan, Vijay, John Stankovic, and Kamin Whitehouse. "FixtureFinder: discovering the existence of electrical and water fixtures." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
11. Fontugne, Romain, et al. "Strip, bind, and search: a method for identifying abnormal energy consumption in buildings." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
12. Erickson, Varick L., Stefan Achleitner, and Alberto E. Cerpa. "POEM: power-efficient occupancy-based energy management system." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
13. Mitsch, Stefan, Sarah M. Loos, and Andr Platzer. "Towards formal verification of freeway traffic control." Cyber-Physical Systems (ICPS), 2012 IEEE/ACM Third International Conference on. IEEE, 2012.
14. Nawaz, Sarfraz, Christos Efstratiou, and Cecilia Mascolo. "ParkSense: A Smartphone Based Sensing System For On-Street Parking." Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.

15. Tianyu Xiang, et al. "Powering Indoor Sensing with Airflows: A Trinity of Energy Harvesting, Synchronous Duty-Cycling, and Sensing". Proceedings of the 11th ACM Conference on Embedded Network Sensor Systems. ACM, 2013.

Tracking Examples

1. Musa, A. B. M., and Jakob Eriksson. "Tracking unmodified smartphones using wi-fi monitors." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
2. Shen, Yiran, et al. "Efficient background subtraction for real-time tracking in embedded camera networks." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
3. Hnat, Timothy W., et al. "Doorjamb: unobtrusive room-level tracking of people in homes using doorway sensors." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
4. Bajwa, Ravneet, et al. "In-pavement wireless weigh-in-motion." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
5. Zhao, Yang, et al. "Radio tomographic imaging and tracking of stationary and moving people via kernel distance." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
6. Niz, Dionisio De, et al. "On Resource Overbooking in an Unmanned Aerial Vehicle." Proceedings of the 2012 IEEE/ACM Third International Conference on Cyber-Physical Systems. IEEE Computer Society, 2012.
7. Zhou, Pengfei, Yuanqing Zheng, and Mo Li. "How long to wait?: predicting bus arrival time with mobile phone based participatory sensing." Proceedings of the 10th international conference on Mobile systems, applications, and services. ACM, 2012.
8. Hedgecock, Will, et al. "High-Accuracy Differential Tracking of Low-Cost GPS Receivers." Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.

Localization Applications

1. Lazik, Patrick, and Anthony Rowe. "Indoor pseudo-ranging of mobile devices using ultrasonic chirps." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
2. Zhou, Pengfei, et al. "IODetector: A generic service for indoor outdoor detection." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
3. Jun, Junghyun, et al. "Improving indoor localization with social interactions." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
4. Xu, Chenren, et al. "Improving RF-based device-free passive localization in cluttered indoor environments through probabilistic classification methods." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
5. Jiang, Xiaofan, et al. "Design and evaluation of a wireless magnetic-based proximity detection platform for indoor applications." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
6. Xu, Chenren, et al. "SCPL: indoor device-free multi-subject counting and localization using radio signal strength." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
7. Sallai, János, et al. "Acoustic shockwave-based bearing estimation." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
8. Yang, Zheng, Chenshu Wu, and Yunhao Liu. "Locating in fingerprint space: wireless indoor localization with little human intervention." Proceedings of the 18th annual international conference on Mobile computing and networking. ACM, 2012.
9. Nandakumar, Rajalakshmi, Krishna Kant Chintalapudi, and Venkata N. Padmanabhan. "Centaur: locating devices in an office environment." Proceedings of the 18th annual international conference on Mobile computing and networking. ACM, 2012.

10. Rai, Anshul, et al. "Zee: Zero-effort crowdsourcing for indoor localization." Proceedings of the 18th annual international conference on Mobile computing and networking. ACM, 2012.
11. Liu, Hongbo, et al. "Push the limit of WiFi based localization for smartphones." Proceedings of the 18th annual international conference on Mobile computing and networking. ACM, 2012.
12. Chen, Yin, et al. "Fm-based indoor localization." Proceedings of the 10th international conference on Mobile systems, applications, and services. ACM, 2012.
13. Sen, Souvik, et al. "You are facing the mona lisa: spot localization using phy layer information." Proceedings of the 10th international conference on Mobile systems, applications, and services. ACM, 2012.
14. Wang, He, et al. "No need to war-drive: Unsupervised indoor localization." Proceedings of the 10th international conference on Mobile systems, applications, and services. ACM, 2012.
15. Manweiler, Justin Gregory, Puneet Jain, and Romit Roy Choudhury. "Satellites in our pockets: an object positioning system using smartphones." Proceedings of the 10th international conference on Mobile systems, applications, and services. ACM, 2012.
16. Yoon, Sungro, Kyunghan Lee, and Injong Rhee. "FM-based indoor localization via automatic fingerprint DB construction and matching." Proceeding of the 11th annual international conference on Mobile systems, applications, and services. ACM, 2013.
17. Liu, Kaikai, Xinxin Liu, and Xiaolin Li. "Guoguo: Enabling Fine-grained Indoor Localization via Smartphone." Proceeding of the 11th annual international conference on Mobile systems, applications, and services. ACM, 2013.

Applications and the Physical Context Attribute:

Personal and home activity monitoring (e.g., for assisted living)

Personal and home activity monitoring.

1. Nirjon, Shahriar, et al. "MusicalHeart: A hearty way of listening to music." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
2. Zhan, Andong, et al. "Accurate caloric expenditure of bicyclists using cellphones." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
3. Verma, Sonal, Andrew Robinson, and Prabal Dutta. "AudioDAQ: turning the mobile phone's ubiquitous headset port into a universal data acquisition interface." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
4. Ju, Younghyun, et al. "SymPhoney: a coordinated sensing flow execution engine for concurrent mobile sensing applications." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
5. Lu, Jiakang, and Kamin Whitehouse. "SunCast: fine-grained prediction of natural sunlight levels for improved daylight harvesting." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
6. Ellis, Carl, Mike Hazas, and James Scott. "Matchstick: a room-to-room thermal model for predicting indoor temperature from wireless sensor data." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
7. Zhang, Jin, et al. "A real-time auto-adjustable smart pillow system for sleep apnea detection and treatment." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
8. Mokaya, Frank O., et al. "MARS: a muscle activity recognition system enabling self-configuring musculoskeletal sensor networks." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
9. Nath, Suman. "Ace: exploiting correlation for energy-efficient and continuous context sensing." Proceedings of the 10th international conference on Mobile systems, applications, and services. ACM, 2012.
10. Lee, Youngki, et al. "CoMon: cooperative ambience monitoring platform with continuity and benefit awareness." Proceedings of the 10th international conference on Mobile systems, applications, and services. ACM, 2012.

11. Lee, Kyungmin, et al. "AMC: Verifying User Interface Properties for Vehicular Applications." Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.
12. You, Chuang-Wen, et al. "CarSafe App: Alerting Drowsy and Distracted Drivers using Dual Cameras on Smartphones." Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.
13. Wang, Yan, et al. "Sensing Vehicle Dynamics for Determining Driver Phone Use." Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.
14. Cheng, Heng-Tze, et al. "NuActiv: Recognizing Unseen New Activities Using Semantic Attribute-Based Learning." Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.
15. Lee, Youngki, et al. "SocioPhone: Everyday Face-to-Face Interaction Monitoring Platform Using Multi-Phone Sensor Fusion." Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.
16. LiKamWa, et al. "MoodScope: Building a Mood Sensor from Smartphone Usage Patterns". Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.
17. Nirjon, Shahriar, et al. "Auditeur: A mobile-cloud service platform for acoustic event detection on smartphones." (2013). Proceedings of the 11th international conference on Mobile systems, applications, and services. ACM, 2013.
18. Valtazanos, Aris, D. K. Arvind, and Subramanian Ramamoorthy. "Using wearable inertial sensors for posture and position tracking in unconstrained environments through learned translation manifolds." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
19. Bidmeshki, Mohammad-Mahdi, and Roozbeh Jafari. "Low Power Programmable Architecture for Periodic Activity Monitoring." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
20. Luo Chengwen, Chan Mun Choon. "SocialWeaver: Collaborative Inference of Human Conversation Networks Using Smartphones". Proceedings of the 11th ACM Conference on Embedded Network Sensor Systems. ACM, 2013.
21. Tian Hao, et al. "iSleep: Unobtrusive Sleep Quality Monitoring using Smartphones". Proceedings of the 11th ACM Conference on Embedded Network Sensor Systems. ACM, 2013.
22. Samuli Hemminki, et al. "Accelerometer-Based Transportation Mode Detection on Smartphones". Proceedings of the 11th ACM Conference on Embedded Network Sensor Systems. ACM, 2013.

Part III: Services

Services and the Time Attribute:

Real-time Scheduling:

1. Keller, Matthias, Jan Beutel, and Lothar Thiele. "How was your journey?: uncovering routing dynamics in deployed sensor networks with multi-hop network tomography." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
2. Puccinelli, Daniele, et al. "Broadcast-free collection protocol." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
3. Liu, Wei, et al. "Exploiting ephemeral link correlation for mobile wireless networks." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
4. Österlind, Fredrik, et al. "Strawman: resolving collisions in bursty low-power wireless networks." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
5. Zimmerling, Marco, et al. "pTunes: Runtime parameter adaptation for low-power MAC protocols." Proceedings of the 11th international conference on Information Processing in Sensor Networks. ACM, 2012.
6. Loukas, Andreas, et al. "Think globally, act locally: on the reshaping of information landscapes." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.

7. Olaf Landsiedel, et al. "Capture at Scale: Ultra-fast Wireless All-to-all Communication". . " Proceedings of the 11th ACM Conference on Embedded Network Sensor Systems. ACM, 2013.

Services and Physical Context:

Joint control of time, quality and energy:

The control server - joint scheduling and control quality optimization.

1. Bai, Jia, et al. "Optimal cross-layer design of sampling rate adaptation and network scheduling for wireless networked control systems." Proceedings of the 2012 IEEE/ACM Third International Conference on Cyber-Physical Systems. IEEE Computer Society, 2012.
2. Wang, Xiaofengteng, Naira Hovakimyan, and Lui Sha. "L1Simplex: fault-tolerant control of cyber-physical systems." Proceedings of the ACM/IEEE 4th International Conference on Cyber-Physical Systems. ACM, 2013.

Energy optimization - joint control of time and energy.

1. Ferrari, Federico, et al. "Low-power wireless bus." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
2. Mohammad Ashiqur Rahman, et al. " Energy Efficient Navigation Management for Hybrid Electric Vehicles on Highways ". Proceedings of the ACM/IEEE 4th International Conference on Cyber-Physical Systems. ACM, 2013.

Performance Management:

Troubleshooting, Debugging, and Avoidance by Design:

1. Sundaram, Vinaitheerthan, Patrick Eugster, and Xiangyu Zhang. "Prius: generic hybrid trace compression for wireless sensor networks." Proceedings of the 10th ACM Conference on Embedded Network Sensor Systems. ACM, 2012.
2. Zhou, Ruogu, and Guoliang Xing. "Nemo: A high-fidelity noninvasive power meter system for wireless sensor networks." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
3. Hermans, Frederik, et al. "SoNIC: classifying interference in 802.15. 4 sensor networks." Proceedings of the 12th international conference on Information processing in sensor networks. ACM, 2013.
4. Philipp Sommer and Branislav Kusy. "Minerva: Distributed Tracing and Debugging in Wireless Sensor Networks". Proceedings of the 11th ACM Conference on Embedded Network Sensor Systems. ACM, 2013.

Part IV: Programming Paradigms:

1. Sant'Anna, Francisco, et al. "Safe System-level Concurrency on Resource-Constrained Nodes." Proceedings of the 11th ACM Conference on Embedded Network Sensor Systems. ACM, 2013.