[1] Self-organizing sensor networks with reconfigurable smart components. Auburn University, SensIT web site http://www.eng.auburn.edu/users/lim/sensit.html. [bib | .html]

[2] S. Bhatnagar, B. Deb, and B. Nath. Service differentiation in sensor networks. In *Proceedings of Fourth International Symposium on Wireless Personal Multimedia Communications*, Sept. 2001. [bib]

[3] M. Chu, H. Haussecker, and F. Zhao. Scalable information-driven sensor querying and routing for ad hoc heterogeneous sensor networks. *International Journal on High Performance Computing Applications*, 2002. (to appear). Also, Xerox Palo Alto Research Center Technical Report P2001-10113, May 2001. [bib]

> This paper describes two novel techniques, information-driven sensor querying (IDSQ) and constrained anisotropic diffusion routing (CADR), for energy-efficient data querying and routing in ad hoc sensor networks for a range of collaborative signal processing tasks. The key idea is to introduce an information utility measure to select which sensors to query and to dynamically guide data routing. This allows us to maximize information gain while minimizing detection latency and bandwidth consumption for tasks such as localization and tracking. Our simulation results have demonstrated that the information-driven querying and routing techniques are more energy efficient, have lower detection latency, and provide anytime algorithms to mitigate risks of link/node failures.

[4] Collaborative sensemaking of distributed sensor data for target recognition and condition monitoring. Xerox PARC, CoSense web site http://www2.parc.com/spl/projects/cosense/. [bib | http]

[5] Database technology for large-scale sensor networks. Cornell University, Cougar web site http://www.cs.cornell.edu/database/cougar/index.htm. [bib | http]

[6] B. Deb, S. Bhatnagar, and B. Nath. A topology discovery algorithm for sensor networks with applications to network management. Technical Report DCS-TR-441, Department of Computer Science, Rutgers University, May 2001. [bib]

[7] L. Doherty. Algorithms for position and data recovery in wireless sensor networks. Master's thesis, UC Berkeley, May 2000. [bib]

> Networks of hundreds or thousands of sensor nodes equipped with sensing, computing and communication ability are conceivable with recent technological advancement. Methods are presented in this report to recover and visualize data from wireless sensor networks, as well as to estimate node positions. A communication system is assumed wherein information from sensor nodes can be transferred to a centralized computer for data processing, though suggestions are made for extensions to distributed computation. Specifically, this report presents four topics. First, the notion of using network connectivity to reconstruct node positions via linear or semidefinite programming is explored. Random feasible node placement and bounding methods are both found to increase in precision with the indiviual geographical constraints. Second, the potential effectiveness of two correlation-based sensor data encoding schemes is reported. Blind correlation methods are found to provide meager compression while semi-blind correlation can effectively reduce bandwidth requirements by one-half. Third, trajectory reconstruction through a sparse sensor network is used to track objects with expectation-minimization techniques. Trajectories can be distinguished providing that sufficient spatial or temporal separation exists. Fourth, optical flow algorithms are used to visualize time-varying continuous flow around the network. A qualitative analysis of the reconstructed flow for several case studies suggests a minimal node density as related to flow speeds.

[8] Dynamic sensor networks. UCLA, DSN web site http://www.east.isi.edu/projects/DSN/. [bib | http]

[9] W. R. Heinzelman, J. Kulik, and H. Balakrishnan. Adaptive protocols for information dissemination in wireless sensor networks. In *Mobile Computing and Networking*, pages 174-185, 1999. [bib | .html]

> In this paper, we present a family of adaptive protocols, called SPIN (Sensor Protocols for Information via Negotiation), that efficiently disseminates information among sensors in an energy-constrained wireless sensor network. Nodes running a SPIN communication protocol name their data using high-

level data descriptors, called metadata. They use meta-data negotiations to eliminate the transmission of redundant data throughout the network. In addition, SPIN nodes can base their communication decisions both upon application-specific knowledge of the data and upon knowledge of the resources that are available to them. This allows the sensors to efficiently distribute data given a limited energy supply. We simulate and analyze the performance of two specific SPIN protocols, comparing them to other possible approaches and a theoretically optimal protocol. We find that the SPIN protocols can deliver 60% more data for a given amount of energy than conventional approaches. We also find that, in terms of dissemination rate and energy usage, the SPIN protocols perform close to the theoretical optimum.

[10] D. Li, K. D. Wong, Y. H. Hu, and A. M. Sayeed. Detection, classification and tracking of targets. *IEEE Signal Processing Magazine*, pages 17-29, Mar. 2002. ISSN 1053-5888. [bib]

[11] A. Lim. Distributed services for information dissemination in self-organizing sensor networks. *Special Issue on Distributed Sensor Networks for Real-Time Systems with Adaptive Reconfiguration. Journal of Franklin Institute*, 338(6):707-727, Sept. 2001. ISSN 0016-0032. [bib]

Dynamic enterprise systems, such as the battlefield, use self-organizing network infrastructure to gather and disseminate real-time information for controlling the enterprise. Very large number of highly mobile sensor data sources and users may be scattered over a wide area with little or no fixed network support. These large surveillance sensor networks must adapt rapidly to dynamic changes in sensor nodes configuration. Dynamic query processing and target tracking through this unstructured sensor network of surveillance information sources and users must use the appropriate distributed services and network protocols to solve the problems of mobility, dispersion, weak and intermittent disconnection, dynamic reconfiguration, and limited power availability. We provide three main distributed services: lookup service, composition service, and dynamic adaptation service. Through a distributed implementation of these services, other application-specific network and system services can be defined spontaneously in the sensor network. They also enable dynamic adaptation of these services to incremental addition and removal of sensor nodes, device failure and degradation, migration of sensor nodes, and changing requirements in tasks and networks. When placed together impromptu, sensor nodes should immediately know about the capabilities and functions of other smart nodes and network together as a community system to perform coordinated tasks and networking functionalities.

[12] S. Park, A. Savvides, and M. B. Srivastava. Simulating networks of wireless sensors. In *2001 Winter Simulation Conference*, 2001. [bib]

Recent advances in low-power embedded processors, radios, and micro-mechanical systems (MEMs) have made possible the development of networks of wirelessly interconnected sensors. With their focus on applications requiring tight coupling with the physical world, as opposed to the personal communication focus of conventional wireless networks, these wireless sensor networks pose significantly different design, implementation, and deployment challenges. In this paper, we present a set of models and techniques that are embodied in a simulation tool for modeling wireless sensor networks. Our work builds up on the infrastructure provided by the widely used ns-2 simulator, and adds a suite of new features and techniques that are specific to wireless sensor networks. These features introduce the notion of a sensing channel through which sensors detect targets, and provide detailed models for evaluating energy consumption and battery lifetime.

[13] Reactive sensor networks. Pennsylvania State University, RSN web site http://strange.arl.psu.edu/RSN/. [bib | http]

[14] Scalable coordination architectures for deeply distributed systems. USC, SCADDS web site http://www.isi.edu/div7/scadds/. [bib | http]

[15] SensIT program web site http://dtsn.darpa.mil/ixo/sensit.asp. [bib | http]

[16] SensorSim web site http://nesl.ee.ucla.edu/projects/sensorsim/. [bib | http]

[17] UC Berkeley, Sensorweb web site http://basics.eecs.berkeley.edu/sensorwebs/. [bib | http]

[18] Agent-based tasking of massive sensor networks. University of Maryland, SensIT web site http://www.cs.umd.edu/users/vs/senseit.html. [bib | .html]

[19] Automated construction and maintenance of spatially constrained information in pervasive micro sensor networks. Rutgers University, Webdust web site http://athos.rutgers.edu/dataman/webdust/. [bib | http]

[20] Location-centric distributed computation and signal processing in microsensor networks. University of Wisconsin-Madison web site http://www.ece.wisc.edu/~sensit/. [bib | http]

This file was generated by bibtex2html 1.96.