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Homework #1.B

List of papers focusing on Inventory Management, or required systems for such.

H. Liu, H. Darabi, P. Banerjee, and J. Liu, "Survey of wireless indoor positioning techniques and systems," Systems, Man, and Cybernetics, Part C: Applications and Reviews, IEEE Transactions on, vol. 37, no. 6, pp. 1067-1080, nov. 2007.

Accessed via <http://ieeexplore.ieee.org/xpl/abstractReferences.jsp?arnumber=4343996>

Abstract: Given that sensors/motes are non-stationary, techniques are provided on finding the locations of sensors (implied: products).

Mark L. McKelvin, Jr. , Mitchel L. Williams , Nina M. Berry, Integrated radio frequency identification and wireless sensor network architecture for automated inventory management and tracking applications, Proceedings of the 2005 conference on Diversity in computing, October 19-22, 2005, Albuquerque, New Mexico, USA

Accessed via <http://dl.acm.org/citation.cfm?id=1095261> (Not free for mines students, so didn't read, but looks promising)

Ning Wang, Naiqian Zhang, Mauhua Wang, Wireless sensors in agriculture and food industry—Recent development and future perspective, Computers and Electronics in Agriculture, vol. 50, iss. 1, pp. 1-14, jan 2006.

Accessed via <http://www.sciencedirect.com/science/article/pii/S0168169905001572>

Abstract: Monitoring intake and volume in processing can help increase manufacture efficiencies. This paper provides applications to agriculture and food industry.

In general, my findings were large when discussing the system requirements for industrial sensor networks, and minimal when discussing specific inventory-management applications. The argument for this, I think, is the magnitude of inventory that is kept in measurable bins/containers. The product-level can easily be found by a fluid-level or weight-sensor, and relayed to an industrial sensor network. There will also be very unique sensors, varying on product. I also suspect a wall of proprietary application around the subject: few would give up their genuine trade-secrets on inventory management. Listed above are the few industrial network papers that mention application for inventory management. There's a plethora focused on how to implement robust, industrial-strength sensor networks.

Honestly, inventory management techniques could be applied to most industries that makes a physical product. The difficulty results in sensing techniques. Monitoring high-volume tiny product is easy: fluid level or container level. Monitoring large product that goes through a process is easy: 1 sensor per product, and remove after processing (depends on processing techniques). The difficulty lies in medium volume products that aren't prone to sensor attachment. Passive RFID is the closest sensor that can be applied effectively for most scenarios. Arches with RFID detectors can be deployed to monitor inventory movement, but it still requires an attached RFID. In a fully automated system, sensors on the machines can be used to estimate product movement, but inaccuracies can arise, as it can sometimes assume proper operation. Further sensing techniques become very specific: some techniques could alter product (shooting an EM wave at things can easily mess them up, for example).