Gueaieb, W and Miah Md.S.‘s paper presented an intelligent novel nonvision-based robot using RFID technology. [1] In their project, the robot was attached with two RFID antennas which was used to recognize RFID tags on the moving path for controlling the moving of the robot. In the whole process three stages of experiments was shown. All the stages were using a RFID reader attached with the robot and read tags from the moving path. In the development of the whole project, the robot was firstly tried to move following a line segment, and then tried to move following a complex path. After successfully try with the two approach and then the third experiment—moving following a hallway is done.

Wijk and Christensen developed an algorithm to extract natural landmark form sonar data. [2]

A mobile robot which can navigate in a known environment is developed by Hallmann and Siemiatkowska. [3] 16 sonars, 16 infrared sensors, an onboard Pentium computer, and a gray-scal camera is equipped with the robot. In this project, information on a map of the environment to be tested is built inside. The built map is developed based on information feedback from the sonar and sensors. Landmarks was also placed in specific locations to help with the navigation.

A lot of robot navigation algorithms used the approach of natural landmarks. For example, Betge-Brezetz et al. [4] used high-level representation of the natural scene to do the navigation in the unknown environment.

S.-Y. Yi and B.-W. Choi [5] presented an indoor robot which four ultrasonic generator is consists in a global ultrasonic system for fixing a priori known environment.

Hahnel, D et al. [6] analyzed Radio Frequency Identification (RFID) could be implemented to for a better mobile robot localization.

RFID sensors have entered the field of mobile robotics in the last decade. [7]

Tasks like navigation, localization and mapping can be done with information inside a RFID tags. [6]

RFID technology is widely used in most applications, but in most cases readers are stationary while tags are attach with the moving objects. [6] In the project of Hahnel, D et al., they tried to trigger the events with a reader, which was equipped with the robot, and detected a RFID tag when the robot moves into the field of signal range.

HyungSoo L et al. [7] presented an indoor robot using an efficient RFID system which a scheme for the efficient localization is designed. And RFID tags with absolute position information were attached on the floor for localization.

References

[1] Gueaieb, W.; Miah, Md.S., "An Intelligent Mobile Robot Navigation Technique Using RFID Technology," Instrumentation and Measurement, IEEE Transactions on , vol.57, no.9, pp.1908,1917, Sept. 2008

[2] O. Wijk and H. I. Christensen, “Localization and navigation of a mobile robot using natural point landmarks extracted from sonar data,” Robot. Auton. Syst., vol. 31, no. 1/2, pp. 31–42, Apr. 2000.

[3] I. Hallmann and B. Siemiatkowska, “Artificial landmark navigation system,” in Proc. Int. Symp. Intell. Robot. Syst., Jul. 2001, pp. 219–228.

[4] S. Betge-Brezetz, R. Chatila, and M. Devy, “Control and localization of a post distributing mobile robot,” in Proc. IEEE Int. Conf. Robot. Autom., 1994, pp. 150–156.

[5] S.-Y. Yi and B.-W. Choi, “Autonomous navigation of indoor mobile robots using a global ultrasonic system,” Robotica Archive, vol. 22, no. 4, pp. 369–374, Aug. 2004.

[6] Hahnel, D.; Burgard, W.; Fox, D.; Fishkin, K.; Philipose, M., "Mapping and localization with RFID technology," Robotics and Automation, 2004. Proceedings. ICRA '04. 2004 IEEE International Conference on , vol.1, no., pp.1015,1020 Vol.1, 26 April-1 May 2004

[7] Klaus Finkenzeller. RFID Handboook: Radio-Frequency Identification Fundamentals and Applications. Wiley, New York, 2000.

[8] HyungSoo Lim; ByoungSuk Choi; Jangmyung Lee, "An Efficient Localization Algorithm for Mobile Robots based on RFID System," SICE-ICASE, 2006. International Joint Conference , vol., no., pp.5945,5950, 18-21 Oct. 2006

[9] GUEAIEB, W., MIAH, M.. A Modular Cost-Effective Mobile Robot Navigation System Using RFID Technology. Journal of Communications, North America, 4, mar. 2009.