"Navigation Technique for industrial robot with the help of RFID TAG"

Vikas Bakshi
Department of Mechanical Engineering
Swami Vivekananda College of Engineering, Indore, Madhya Pradesh, India

Rajnish Katarne
Department of Mechanical Engineering
Swami VivekanandaCollege of Engineering, Indore, Madhya Pradesh, India

Dr. Sanjay Purkar
Department of Mechanical Engineering
Swami VivekanandaCollege of Engineering, Indore, Madhya Pradesh, India

Abstract - Robots are expected to be a solution for vast applications in service and Production industry. However, a great problem for most environments and applications is the robust and cheap positioning, i.e. the determination of the robot's current position. This paper presents an innovative mobile robot navigation technique using Radio Frequency Identification (RFID) technology. Navigation based on processing some analog features of an RFID signal is a promising alternative to different types of navigation methods in the state of the art. This paper discusses how this is achieved by placing RFID tags in the 3-D space so that the lines linking their projections on the ground define the "free ways" along which the robot can (or is desired to) move.

Keywords: RFID, Mobile robots, Navigation, position control, etc.

I. INTRODUCTION

Robotics is the branch of technology that deals with the design, construction, operation, and application of robots as well as computer systems for their control, sensory feedback, and information processing. These technologies deal with automated machines that can take the place of humans in dangerous environments or manufacturing processes, or resemble humans in appearance, behavior, and/or cognition. An industrial robot is officially defined by as an automatically controlled, reprogrammable, multipurpose manipulator programmable in three or more axis. The field of robotics may be more practically defined as the study, design and use of robot systems for manufacturing.

Radio-frequency identification (**RFID**) is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain electronically stored information. Some tags are powered by and read at short ranges (a few meters) via magnetic fields (electromagnetic induction). Others use a local power source such as a battery, or else have no battery but collect energy from the interrogating EM field, and then act as a passive transponder to emit microwaves or UHF radio waves (i.e., electromagnetic radiation at high frequencies). Battery powered tags may operate at hundreds of meters. Unlike a barcode, the tag does not necessarily need to be within line of sight of the reader, and may be embedded in the tracked object.

II. LITERATURE REVIEW

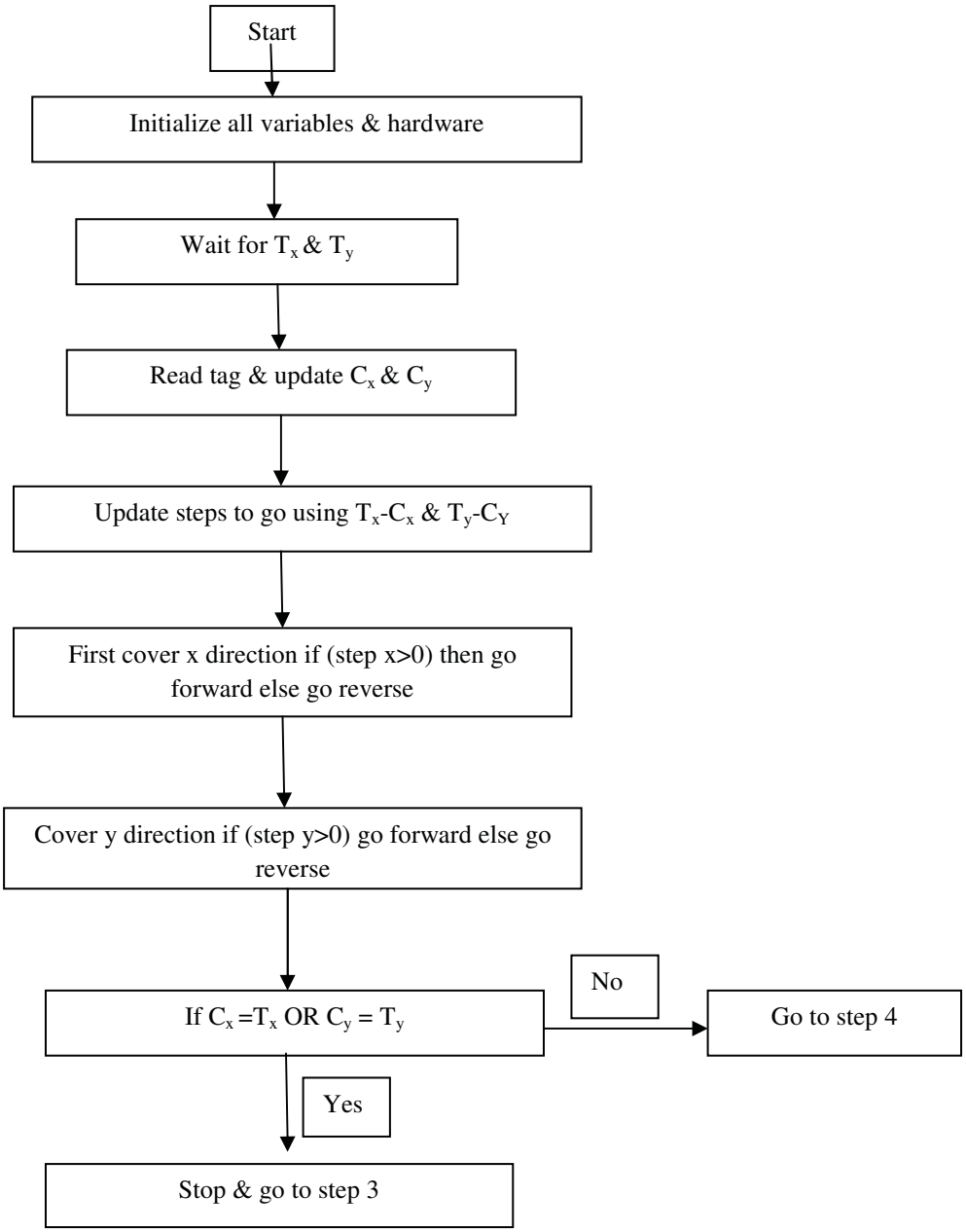
In recent years, significant research has been conducted on mobile robotics that incorporates several sensors and landmarks as navigation media in the environment. In this section, we provide a briefing on some of the recent research related to mobile robot navigation.

Rainer Kummerle et. al. [1] presented a Navigation system for robots operating in crowded urban environments. The navigation system has been implemented and tested in several large-scale Field tests. Maxim A. Batalin et.al. [2] Proposed an algorithm for Robot navigation using a sensor network embedded in the environment. A. Sh. Khusheef et.al. [3] developed a simulation system to identify difficulties facing mobile robot navigation in industrial

environments, and then tackle these problems effectively. The simulation makes use of information provided by various sensors including vision, range, and force sensors. Huosheng Hu et.al. [4] Proposed a Landmark based navigation technique of industrial mobile robot by using a kalman filter algorithm. Matt Knudson et.al. [5] Suggested a navigation algorithm for exploration robots which avoid obstacles and reach specific destinations in limited time and with limited observations.

The aim of the present work is to develop an innovative mobile robot navigation technique using Radio Frequency Identification (RFID) technology in order to exploit the ability of a mobile robot to navigate in an unknown environment without a vision system and without building an approximate map of the robot workspace, as is the case in most other navigation algorithms

III. METHODOLOGY



IV. CONCLUSION

This study aimed to apply a new technique for the navigation of the industrial robot for material handling because it works quick and easily. At the same time it also reduced the human effort and cost so therefore increases the productivity. Here we have interfaced the robot with different kinds of I/O devices and our method allows for storing more programs to enhance more functionality. From our work, we deduced that in comparison to humans, robots can be much stronger and are therefore able to lift heavier weights and exert larger forces. They can be very precise in their movements, reduce labor costs, improve working conditions, reduce material wastage and improve product quality.

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