

DESIGN OF SENSING SYSTEM AND ANTICIPATIVE BEHAVIOR FOR HUMAN FOLLOWING OF MOBILE ROBOTS

ABSTRACT

In particular, the issue should be addressed from the perspective of human-robot interaction since humans are aware of the following actions. This makes the problem quite different from human tracking where recognition and location accuracy are the main concerns. An anticipative human following behavior is proposed by incorporating the human model. The human model is constructed using relevant scientific studies about human walk and social interaction, allowing the robot to predict the human trajectory and to take preemptive action. To realize the idea, it is necessary to have a robust sensing system that is capable of tracking the human location persistently.

EXISTING SYSTEM

A virtual spring connects the human and the robot. When the human moves, the robot smoothly follows afterward. Furthermore, constraining this virtual spring to a specific angle allows the robot to follow the human side by side. One limitation of the virtual spring is that it is a passive behavior, in the sense that the robot does not make any assumption about the human movement, and therefore, it will not take any preemptive action.

DISADVANTAGE

- Unwanted accident
- Robot can be confused at some human action

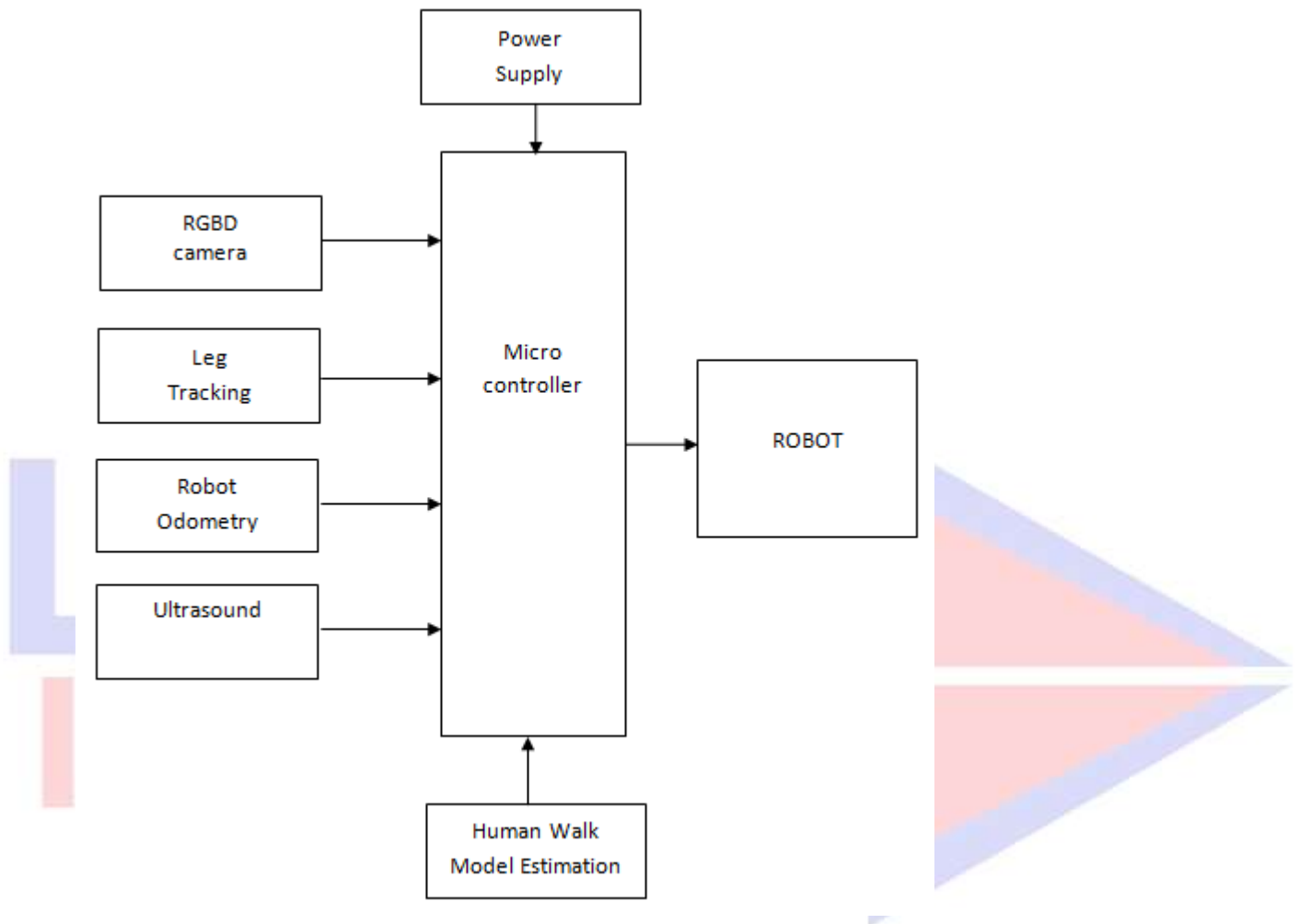
PROPOSED SYSTEM

We propose a sensing system based on a novel 3-D mean shift algorithm on RGBD camera. The system performance is assessed through experimental evaluation of three specific human following scenarios: following from behind, following on the side, and following in front. Each of these scenarios has its particularities and applications, thus providing insight about the effectiveness and usability of anticipative behavior.

ADVANTAGE

- Good interaction to the human
- Reduce the unwanted accident
- High efficiency

BLOCK DIAGRAM



HARDWARE REQUIREMENTS

- RGBD camera
- Robot odometry
- Ultrasound
- Microcontroller
- Power supply
- Mobile robot

SOFTWARE REQUIREMENTS

- MICROCONTROLLER COMPILER
- PROTEUS SOFTWARE

MICROCONTROLLER may ATMEGA,8051,PIC,Arduino

