

## **Development of Autonomous Mobile Robots Using Locally Available Hardware Components**

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### **Project Summary**

The control of autonomous mobile robots has been, and still is a subject of numerous research studies. The rise in popularity of the single-chip microcontrollers has opened up new arenas for creating intelligent robots. Building a robot, however, requires more expertise than simple programming. Locomotion actuators, manipulators, control systems, sensor suits, efficient power supplies, well-engineered software-all of these subsystems have to be designed to fit into an appropriate package suitable for carrying out the robot's task.

In Bangladesh, the design and fabrication of robots are made complicated by the non-availability of required hardware components. Hence, design is carried out based on the available hardware components, most of those are used components. The characteristics of the components are assessed experimentally and the design is based on the obtained results. PIC microcontroller based control is used in the robots designed, and the system utilizes various feedback signals from the sensors for its navigation and motion control. High speed data acquisition systems are employed to monitor temporal data from the wheels of the robots, motor currents and battery voltages to assess the response of the robots to the control actions. Hence, optimum control strategies are obtained using the experimental data. The technology developed to design and control the autonomous robots are successfully employed to design the autonomous mobile robots for Asia-Pacific Robot Contests, Robocon 2007, Hanoi and 2008, Pune.