

Additional Details from U V Patel College of Engineering, Ganpat University Team

>> Tools used:

- MATLAB – To develop a DIP algorithm to detect shuttlecock
- Stateflow – To develop algorithms for autonomous and manual robots
- Simulink – To model autonomous and manual robot models, autogenerate code, and deploy it to an ATmega 2560 microcontroller

>> Toolboxes used:

- Image Processing Toolbox
 - Snapshot of the shuttlecock in the Color Thresholder app
 - Selection of a suitable color map
 - Selection of the colors to be detected from the image
 - Generation of a function to create a binary image from the image, including the detected shuttlecock
 - Addition of the generated function to the main algorithm
- MATLAB and Simulink Support Package for Arduino Hardware
 - Data acquisition from line follower sensors (LSAs) and infrared sensors (IRs) of autonomous and manual robots in a Simulink model using the support package
 - Received signals are fed to a Stateflow chart in which the main algorithm consists of different algorithms, such as a line follower algorithm; a 180-degree rotation algorithm; an algorithm to hold position on the junction for an autonomous robot; a Mecanum wheeled base algorithm; algorithms for gripper pistons; and an algorithm for stepper motor for a manual robot
 - Analog signals from LSAs are fed to a MATLAB function block in which PWM signals for all motors are derived using proportional control
 - All the output signals from the Stateflow chart are fed to motors and DCVs
 - Code for Arduino hardware is automatically generated and deployed to it