

Badminton is a racquet game played on court with shuttles made from feathers or plastic. Top players train with many shuttlecocks at once, which are fed by coach from hand. After a short training period, shuttlecocks are scattered around the court, which need to be picked up so that coach can feed them from hand. In this thesis we created software for autonomous robot that detects shuttlecocks with camera, estimates their position and picks them up. We implemented this as nodes in ROS middleware. During development we created simulated environment in Gazebo, and created plugin that simulates shuttle picking. We also created fully working picking mechanism of real shuttlecocks based on rotary brushes powered by motors, utilising 3D printing. Furthermore, we created and annotated dataset for object detection of over 2500 images and 18500 objects that we used for training and evaluation of state of the art neural network, that detects shuttlecocks from video. As part of our solution we developed ROS nodes that allows us to specify working area and area for filtering detections using RViz interactive markers.