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## Control of 4DoF Manipulator using Neural Network and Image Processing

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**Abstract:** Precise and fast control of any manipulator is the main challenge. In this paper, image processing is used to determine the 3D position of the objects and a predictive controller is used to estimate the best angle values to ensure that the manipulator will reach the target destination precisely, and to avoid any irrational move. This controller consists of a neural network which represents the plant and another neural network that replace the inverse kinematics (Controller). This system checks the controller output and enhances it before it reaches the real plant. This controller can be used for picking up constant objects like fruits, ICs, balls, and merchandise. This system is simple (no need for inverse kinematics), has fast response, and with accurate output (Mean Square Error of the whole system is around 0). To avoid over fitting and to enhance the generalization, around 0.5 million samples were collected using probability laws. Furthermore, this work can be used to control any manipulator, by some modification, so it can be a good assistance for the researchers.