

Project Report*

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Abstract—

INTRODUCTION

A. Mechanical structure

The design of the robot is influenced by the LEGO®Mindstorms®EV3 set CITATION!. While the original set has a movable base it was too small and without an arm with a manipulator. It also does not incorporate the Dynamixel AX-12A Smart Servos used in the final design so the decision to redesign the robot while taking design inspiration from the LEGO®EV3 design. By developing and designing a new platform enables the possibility to adapt the dimensions and design it so that it is possible to use manufacturing methods such as 3D-printing and Laser cutting. The motors used are seven Dynamixel®AX-12A Smart Servos, two on the base for locomotion and four on the arm and one for the gripping tool. The main advantage of using the AX-12As is the possibility of connecting them in series which enables parallel control of all the joints. Additionally with the built in sensors the motors return feedback of the joint angles, angular speed, current draw etc.