The Rubik's Cube Solving Robot

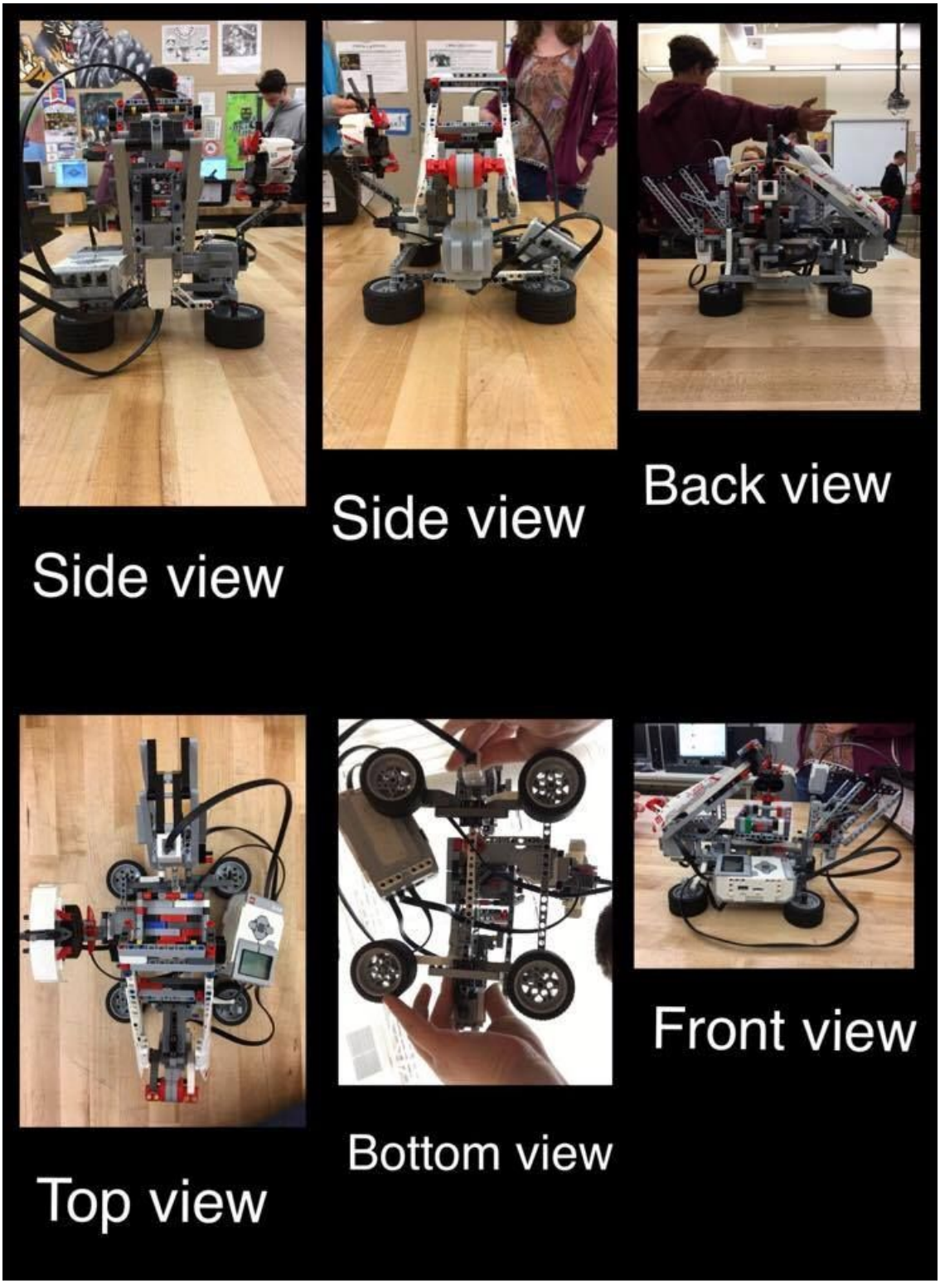
By Ali Short Aj Diamond Ethan Lang Mathew Shipley and Tristan Boyle

When we began to design and research ideas for a robot we realized we had no idea what we were doing. We saw complicated algorithms, complicated designs and complicated programs. We were not excited for the project to come. But then a light shone down on the keyboard, and some higher being began to type the word “Mindcub3r”. We decided to check it out and found a neat robot that could supposedly solve a rubix cube in around 100 seconds. We found a pdf file that included all the build instructions for the bot and also found the full program and some additional features that we could just import to our robot. We finished building the robot and began programming for a few minutes before testing it out for the first time. It sucked. It didn’t do anything except say *Insert Cube*, and even when we put the cube into the bin nothing happened. After a couple days of trying to figure out what was wrong we finally realised what was wrong, in the area that we thought we had to put a Ultrasonic sensor we were actually supposed to put in a Infrared.

After finishing the big Infrared fiasco we decided to reprogram it and try it again. It sucked. Again. Instead of scanning the cube like we wanted to it just reached out a few inches and stopped before being over the cube. It would move back and forth like it was trying to scan the cube but it could just never reach it. After literal days of trying to figure out what was wrong with it and replacing multiple pieces we realised somebody had probably built the scan arm incorrectly. We rebuilt it and tried to run the program again. Surprise, it sucked. We began to get a little frustrated as it was doing the exact same thing as before, reaching out just a little bit before stopping and trying to scan from too far away. It was only after a couple more days that we realised somebody had built the scan arm wrong AGAIN. After rebuilding the scan arm for the 3rd time it finally decided to work.

The robot would now put the scan arm out at the correct length and then spin the cube in a circle, allowing the arm to scan every cube while staying almost completely still. After done scanning all of the cube's sides it would run a calculation allowing it to find a certain set of turns that would allow it to solve the cube. The flip arm would then flip the cube and hold it in place while the turntable would spin the cube allowing the flip arm to flip it to other sides and turn the bottom more than once. After solving the cube it would triumphantly spin the cube in a circle to allow us to see all sides before allowing us to decide if we want to turn the cube into a pattern. After seeing that the robot worked we thank’d the higher being who typed in the name of the mindcub3r and allowed us to perform such a feat.

Robot Pictures:



Here's a screenshot and a flow chart of our program: