The Creation of an Effective Robot
Nathaniel Oo
Dead Robot Society
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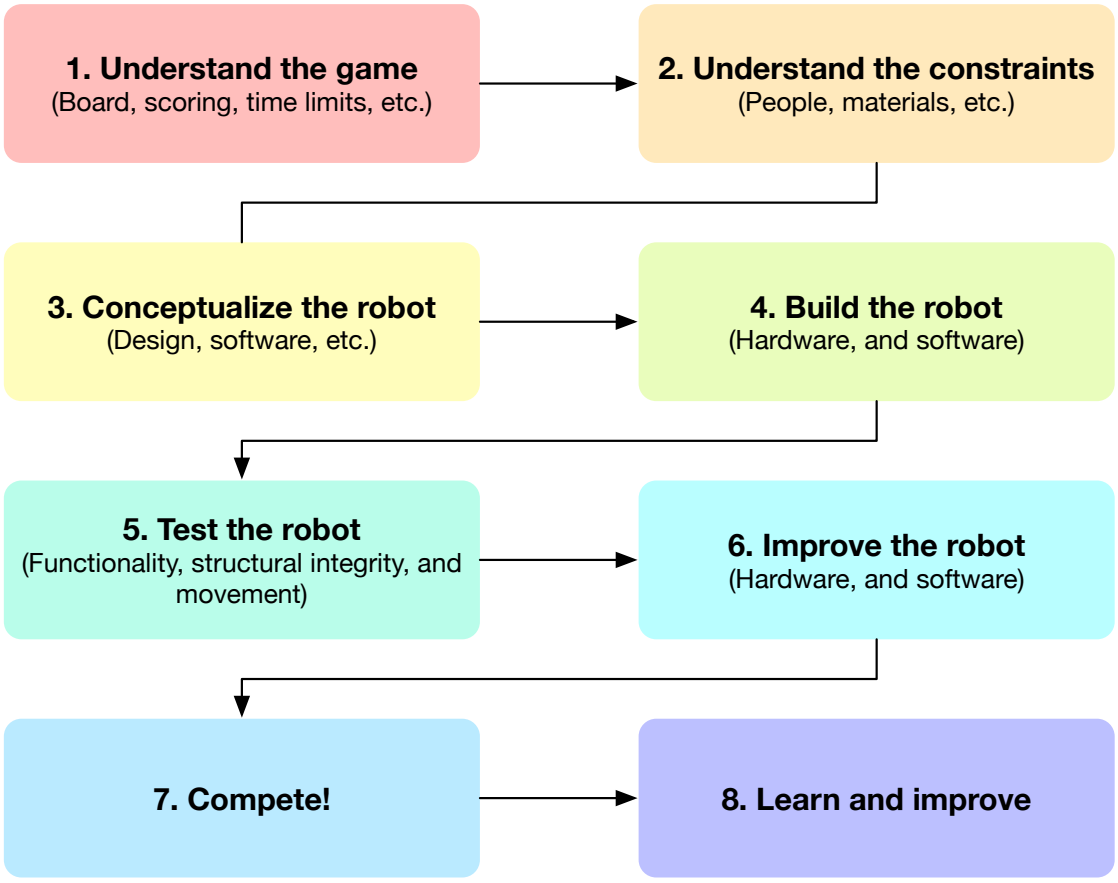
Introduction

When I first joined Botball, and saw how the Dead Robot Society constructed their robots throughout the build period, I knew many steps were taken, but there were no formal written instructions to creating the robots. I felt that describing each step taken towards achieving the final product explicitly would help by clearly identifying considerations taken in the creation of an effective robot.

Approach



1. Understand the game

Before anything else, the basics of the game must be understood. Knowing the board itself as well as the objective and the rules will aid in determining basic requirements with which a robot will be built.

2. Understand the constraints

After becoming comfortable with the basics of the game, one should establish their constraints. Having accurate information regarding the types and numbers of pieces available, as well as the amount of people and time available during the build season are essential to building a robot.

3. Conceptualize the robot

When initially designing a robot, perfection is not the goal, but keep everything realistic. Design moving pieces to be simple and reliable, and make sure the pieces are simplified to reduce complexity during software development.

4. Build the robot

While constructing the first iteration of a robot, make sure every piece is secure and stable. This way, the risk of errors is reduced and consistent operation is achieved. Also be sure to write effective code, keeping everything as simple as possible.

5. Test the robot

Unforeseen problems and restrictions will exhibit during testing. Make sure to address how well the robot's moving pieces function, how rigid the body of the robot is, how the robot moves when faced with various obstacles, and how well the robot fits within the time constraint of the competition.

6. Improve the robot

After testing the robot, correct the issues of the robot and search for opportunities for improvement. This could be as simple as tightening bolts throughout the robot to being as complicated as having to completely redesign the frame. Remember to keep in mind that simplification is desirable if full functionality can be maintained because the risk of error is reduced.

7. Compete

While competing, it is important to pay attention and analyze all of the robot's actions and behaviors. Even though the robot may have been tested numerous times in the past, there is no guarantee that it will behave exactly as it did during testing.

8. Learn and improve

Building off of anything observed during competition, learn from past mistakes or experiences and keep them in mind for next year.

Conclusion

While the method explained may not cover every possible aspect of robot creation, the intent is to provide a structured sequence to consider and help aid the creation of effective robots for the teams. This approach can be used to develop the current robot as well as help apply the best practices across many seasons of Botball resulting in a more mature experience over time.