**SOLUTION APPROACHES**

* **Power Supply Subsystem:** This subsystem is for distribute power towards other subsystems at required voltage level and with specified current limitations.
* **Communication Subsystem:** This subsystem provides communication between the robot and telecontroller subsystem.
* **Motion Subsystem:** This subsystem consists of wheels and motors driving these wheels by which we provide capability of motion to our robot in the game field.
* **Detection Subsystem:** This subsystem detects the boundaries of the field, the position of the opponent robot & ball and also locate itself in the field.
* **Telecontroller Subsystem:** This subsystem is the one we use to send commands to robot via communication subsystem.
* **Main Processor Subsystem:** This subsystem is the main robot computer onboard which controls other subsystem with respect to feedbacks sent from these subsystems.

**Solution Approach of Shooting Subsystem :** We presented two main solutions for this subsystem at this stage of our design process. One of them is constructing an external module for shooting the ball which can be in the form of a hockey stick attached to a motor or a spring system. Other than the stick form it may a have a wider V shape with the same motor or spring attachment. Another way is shooting the ball with robot’s body. In this approach the robot will align itself with respect to the ball position and where the ball is desired to be sent and then hit the ball after acquiring necessary speed.

**Solution Approach of Main Processor Subsystem:** This subsystem is the brain of the robot onboard since it communicates with other subsystems, receives data from them and send commands. We thought of four different possible main processors for this purpose which are FPGA, Raspberry Pi, Arduino or TI Tiva Board. Main advantage of using FPGA is that it is fast, but it is also expensive and more complex compared to other options. Raspberry Pi is not as expensive as FPGA but not cheap as well. It’s modular so different variety of sources are easily accessible. Although, Arduino is the cheapest option but since it is a microcontroller, we need another module to fully operate the complete system. On the other hand, since it is commonly used different libraries can be found. The last option can be using TI Tiva Board which is considered to be inexpensive. However, this is not as modular as the rest, therefore it may be challenging to find required documentation about programming.

**Tests for Shooting Subsystem:** How far the ball is sent will be measured and also the accuracy will be tested by inspection. The efficiency of the motor and the spring module will be analyzed to compare the effectiveness of each.

**Tests for Main Processor Subsystem:** The efficiency and the complexity of our code in different processors are examined to see which one is more rational to use. We will decide on which option is faster and more accurate than the others.