

Background

archetypes, with an e

From studying Battlebot competitions, a few archetypes become evident among the serious competitors. One such archetype is to have a bot with a fast spinning blade to try and shred the opponent. Another common design uses a mechanism such as a claw to try and grab the other robot and move them into obstacles. Some successful bots utilize a studded roller on the front of the bot that spins at high speed and charges the opponent to try and flip them. "Spatula" style flipping bots are also common, which slip an arm or mechanism under the opposing bot and use that to flip them. Robots that hammer the opponent with a large weapon arm often do well and can reap a lot of damage. These archetypes provide not only a starting point for deciding what our robot will do, but a point of reference for what our robot may have to face.

This means it takes damage, not that it deals it out. Not sure if that was the intent.

Good details, examples in this paragraph

Consideration of different potential opponents lead to consideration of different materials to use in response to such opponents. These preliminary considerations include that for electronic housing, armor, chassis, and wheels. (Factors of each include Strength/durability/toughness vs weight/cost/machinability/allowance for heat flow away from electronic components). For example, using aluminum 6061 for parts of chassis which do not have to withstand much abuse is one initial idea. 6061 is lightweight and easily machined. It is also easily welded. The tradeoff is that (compared to steel or even al 7075) it has a lower in strength and hardness. 7075 however is much less easily machined or welded. It would be best used as an outer layer of armor which does not have to be welded to or interact with other components other than the chassis. Simple geometry could be used to limit the manufacturing of 7075. UHMWPE is also a material that could be used to make armor. UHMWPE has an extremely high yield point, and for a 25-pound bot, is nearly unbreakable yet is able to deform enough to dampen a heavy impact without fracture.

"is lower in", or "has lower"

Any other types of steering/ movement?

As for mobilization, after studying many battle bot competitions, it seems that the most common steering system is a dead axle "tank" type control system. Meaning that the left and right drivers are independent and used to steer left or right based on which motor is causing most displacement. The turn radius and response time is dictated by the distance separating inline wheels as well as distance between parallel pairs. Several sizes and materials for wheels are available. After reading blogs published by other bot builders and by going to websites such as BaneBots.com (which manufactures quality yet affordable bot components including motors, wheels, gearboxes, etc.), it seems that Colson wheels are a good option, they are made of a durable lightweight propylene core with a thermoplastic rubber tread which will provide excellent traction on the concrete/asphalt arena. Banebots also manufactures affordable motors available in a large variety of sizes, voltages, speeds, torques, and prices. The selected motor for this bot will also depend on the input/output voltage of the selected control system.

"the"

For the electronic control systems on the project, Arduino based microcontrollers are an attractive option. Many of these microcontrollers are inexpensive and Arduino is widely used by hobbyists, so resources are abundant. Arduinos also come in many shapes and sizes with different features, inputs and outputs. Keeping the electronics cheap and modular will be an important aspect to pay attention too.

Another option for the control system would be to take apart a second-hand remote-controlled vehicle and use its receiver and components. A remote-controlled plane might be a good option as they have more control surfaces and servos than a car.

Communication with the robot can be achieved in many ways. Wi-Fi, Bluetooth and radio based communication are three viable options. Transmitters and receivers for radio based controls are used by hobbyists for remote-controlled planes and cars and off the shelf parts can be found readily. Wi-Fi and Bluetooth receivers for Arduino units are also common, and may allow control from a phone. PlayStation 4 controllers also communicate via Bluetooth, which might provide an off the shelf controller for the robot. Bluetooth protocols are well documented and widely available.

Some overall feedback:

Some good detail, especially in the materials and mobility sections

Very little talk of failure modes, or mitigation

Some grammar and spelling errors

Need references