CHAPTER 8

Mini Sumo Robot

We have used many different applications to create our 3D models in this book, but very few have such an intuitive graphical interface as our next application: Google SketchUp. In Chapter 4, we briefly looked at SketchUp for downloading and converting files found on Google’s 3D Warehouse for the purpose of 3D printing. Now we will properly use SketchUp to design a multipart robot platform that can be used for mini sumo robot competitions, as well as other nefarious means.

In this chapter, we will learn the following:

- A little bit about mini sumo robots and how we can design a robot for competition
- How to use Google SketchUp for designing models for personal manufacturing
- How to assemble a complex model using multiple parts, fasteners, and electronics

SketchUp is more suitable for designing architectural models than it is small-scale designs for manufacturing, but there are some tips and tricks that we can use to create reasonably accurate models for our 3D printers. Before we jump into designing models in SketchUp, let’s first briefly discuss the sport of mini sumo in order to form a design strategy for our competition robot.

What Is Mini Sumo?

A mini sumo robot competition is a small-scale version of robot sumo, first made popular in Japan in the 1980s and ’90s. Like the traditional sport of sumo, two competitors (autonomous robots in our case), enter a ring and attempt to push each other out while themselves trying to stay in the ring. The first robot to be pushed or fall out of the ring loses the match. Figure 8-1 illustrates what a typical mini sumo match looks like.
Here we have two competitors facing off on a regulation competition ring moments before a match begins. The mini-class sumo robots are fairly compact and must conform to a standard size limitation, as shown in Figure 8-2.

As seen in this Figure 8-2, the maximum size of a mini sumo robot can be no larger than a square 10 centimeters in depth and 10 centimeters in width. As long as they fit into the building of the competition, these robots can be any height. The weight for these robots is limited to 500 grams (or 1.1 pounds) or less, with some competitions giving an edge in match seeding to the lighter robots. This size scale suits our 3D printers perfectly—just about anything we design with this goal in mind will be printable on just about any 3D printer.