Hit Me with Your Best Shot: An Arduino Controlled Training Platform for Child Martial Artists

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My project goal was to engineer an interactive punching bag with sensors and lights that will train children to spar in martial arts. The project was overall successful. The platform utilizes five sensors that work by producing an electrical current when two pieces of aluminum foil are pressed together. An Arduino microcontroller and C++ code were used to design the program, which is created so that each sensor has a corresponding LED on the platform. During the program, an LED will light, and if the corresponding target is struck, a different LED will proceed to light. This continues in a random pattern, progressively quickening, until the user either misses a lit target or successfully completes 27 hits. A connected laptop shows the user's score. The physical platform was constructed with a base, upon which the user stands, and a bag created from PVC pipes and foam. The platform has four adjustable heights, and is intended for children aged seven to ten. The platform was designed to improve balance, muscle memory, and accuracy, all of which are pertinent in sparring, as well as encourage life-long participation in martial arts. After many years as a martial arts instructor, I created this bag to help alleviate the boredom that ensues from the repetition within martial arts and to provide visual representation of a child's progress. The project could also be adapted as an additional "instructor" within a martial arts program, as it can be used with minimal supervision.

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