

DizzyCat

DizzyCat is a toy designed to make my cat active again, as she is getting fatter every day and needs to exercise. I unfortunately cannot play with her on a daily basis since moving to New York, and since she is alone for the most part of the day, she spends all her time eating and sleeping.

DizzyCat is a little toy on wheels that has four basic behaviours:

- If the cat is not moving, it slowly creeps towards her.
- If the cat is moving towards the toy, it moves away from her.
- If the cat is moving away from the toy, it moves towards her.
- If the toy bumps into something, it moves in the opposite direction.

The idea is to make an autonomous toy that will keep her entertained for hours. As any cat owner will tell you, it is very difficult to find a good toy because cats expect whatever they are playing with to react to them, either by fighting back or running away. A weight at the end of a string just does not cut it because it quickly becomes boring, even for an animal. Any good cat toy needs to be interactive; it needs to taunt the cat to play with it and offer it some sort of challenge.

Materials and Budget

Qty	Component	Specification	Price
1	Arduino Pro Mini Board	3v / 8MHz	\$18.95
2	XBee Series 1 Module	1mW Wire Antenna	\$45.90
2	XBee Breakout Board		\$5.90
1	DC Motor and Gearbox Kit	Tamiya 70103	\$8.25
2	Tire Set	Tamiya 70145	\$14.50
1	H-Bridge		\$2.35
2	Coin Cell Battery	CR2450	\$9.90
2	Coin Cell Battery Holder		\$1.90
	Foam		\$10.00
	Furry Fabric / Feathers		\$10.00
1	Cat Collar		\$5.00
TOTAL			\$132.65

Special attention will be brought in the design to make **DizzyCat** as quiet as possible, as I have noticed that my cat tends to stay away from noisy things. It should also be built strong as it will probably be thrown around a lot, but should feel soft like a small, helpless animal.

The body of the toy will be made out of blue foam, because it is a very light and fairly solid material. This will be covered with a furry or feathery material so that it feels good to the bite. The moving mechanism will consist of a battery-powered DC motor attached to the wheels, using a system of gears to achieve appropriate speed and torque. The behaviours will be achieved by simply turning the motor in either direction using an H-bridge. Proximity between the cat and **DizzyCat** will be measured using XBee modules. One XBee will be placed on **DizzyCat**, and the other will be attached to a custom cat collar. An Arduino board will take care of the logic, polling the distance between the XBees, judging if both objects are getting closer or further away from each other, and choosing a direction and speed to spin the motor based on this information.

Schedule

Task	Date
Ordering	
Prepare shopping list	03/01
Order Components	03/01
Software	
Proximity Algorithm	03/01
Motor Driving Algorithm	03/08
Electronics + Mechanism	
Circuit Design	03/05
Circuit Construction	03/08
Object	
Physical Design	03/05
Physical Construction	03/10
Collar Design	03/10
Collar Construction	03/12
Testing	03/12