

# Analysis the spikes changes by placing the cockroaches in the different angles

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## Abstract



American cockroach is kind of an insect which has been used in many recent researches and also it has been under a lot of attention in different scientific fields. "Balance" is a new and interesting subject for scientists and these little creatures use a really different mechanism than the other ones as they want to stay in a balanced position.

Life of these cockroaches is tied with the concept of balance which is a very obvious fact. As an example we can think of their speedy walk on the wall or even the roof.

And also dying, turned into upside down position.

Do they use semicircular canals like us? or do they have a different mechanism?

## Research



According to our references we figured out that the cockroach stays balanced without using its brain. The sticky layer at the end of the its leg which is covered by thin hair called.

The tip of the hair is thicker than the other hair parts and looks like a palette knife. This unique structure creates a better circumstance for walking and pacing on different surfaces.

The interesting part of our research was when we found that although these insects have six legs, they approximately use three of them as they walk and they can stay balanced.

## Introducing the matter



Although the researches had shown that the roach does not use the nervous system in its balanced position we decided to look at it in a different way.

Without any doubt the roach uses the mechanism we mentioned as they are walking on a surface, what what if we lift the roach where the feet could press nowhere at the time.

How does the roach stay balanced in a position where the feet are floating in the air? As it was said before ,being upside down is the critical situation for the cockroach when it loses its balance.

But how does it attempt to move back to the first position?

Does it ever use its other body parts?



## Design of experiments



We aimed to disturb the balance by changing the angle of the cockroach with the ground thus to record their reactions and then analyze it using the MATLAB program. To this end, there was created a device to prepare such a situation. In this device, a plastic tube was used to place the cockroach in vertical direction. By changing the angle of the tube and approaching it to the ground, the condition of the cockroach was examined in two stages.

Horizontal: First, the head of the cockroach was cut off so that the brain does not interfere in this stage of the test. Then we inserted the SpikerBox electrodes into the abdominal neural cord and placed it horizontally on the vertical bar. Then the rod was moved from 90 to 180 degrees and the following results were obtained.

Vertical: we put the cockroach in a vertical position and repeated the test.

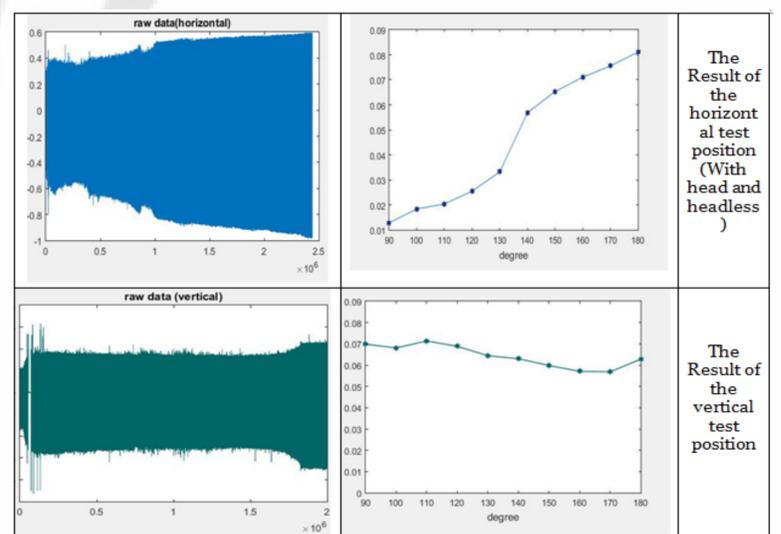
## Conclusion



As shown, the intensity of spikes increased by changing the angle from 90 to 180 degrees.

In the vertical mode, there was little change in the intensity of the spikes. Based on the observations, a vertical message was received late.

in another aspect we can conclude that the roaches have a kind of perception of being shifted from degree to degree by its ventral nerve cord.



## references

- <https://www.rooyan.blogfa.com>
- <http://iranpest.blogfa.com>
- <http://qutmechanics.mihanblog.com>



# Analysis the different color of the light that seen by the cockroach

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## Abstract

American cockroach or the *Blattodea Americana* has been used in many recent experiments and is one of scientists' favorite cases of task.

Although it's pretty easy to find a little cockroach in your backyard at a dark night, you think why the roaches are hardly found in the day light?

## Research

Cockroaches own a pair of compound eyes formed by more than 2000 lenses. Some species of blattodeas have a pair of single-lense eyes called ocelli. Eye of the cockroaches is generally unable to concentrate on motionless pictures and it can only visualize moving objects.

Blattodeas are very sensitive to Infrared, Blue & Green , but they can not distinct Yellow or Red light.

## Introducing the matter

We decided to find the roach's tendency towards different lights and use this idea in practical ways and projects.

And we were also looking for a stimulant other than a roboroch to make the cockroach move in a way we'd like.

The mentioned ideas below are some of those thoughts we had in mind, but due to our limited time, we were unable to test them separately.

## Design of experiments

There was a box made first, and then there were some LED lights with different colors in all four directions and there were some tasks done which were an introduction to these ideas.

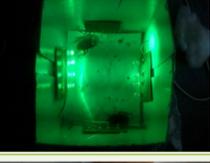
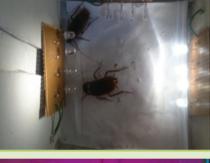
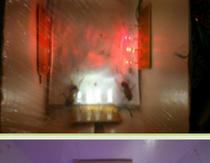
◇Controlling the cockroach's movements without it's antenna(by its eyes) => we used the roboroch's circuit with a slight difference.

◇Cockroach's movement in a dark area on a specific path by fluorescent beads .

◇Cockroach's movement in a specified track by getting close to the tending color and getting away from the disliking color.

◇To keep our settling safe from these insects by lightening a special light color.

## Conclusion

	conclusion	light
	Not ok	red
	ok	purple
	ok	green
	Not ok	sunny
	purple	Purple & red
	green	Red & green
	purple	سبز و بنفش
	None of them	Red & sunny
	purple	Purple & sunny
	green	Green & sunny
	purple	all



## references

- <http://www.mardoman.net>