

Түйін

Мақалада мен физикалық ізденістер мен инженериялық дизайн арасындағы байланысты көрсету арқылы студенттерге инженериялық дизайнмен жұмыс кезінде зерттеу жұмыстарының қажеттігін көрсеттім. Студенттерді зерттеу жұмыстарына қатыстыра отырып, мұғалім оларға физика негіздері мен тәжірибелер арасындағы бос орынды толтыруға көмектеседі.

Resume

In this work, I emphasize the link between physics investigations and engineering design by providing activities that show students the need to investigate while taking on an engineering design challenge. By having students engaged in projects that synthesize investigations with engineering design, teachers are helping them close the gap between the concepts and skills of physics and the practical use of those skills.

Özet

Bu makale, ben öğrencilerin bir mühendislik tasarım sorunu üzerine çekerken araştırmaya ihtiyaç gösteren aktiviteler sunarak fizik araştırmaları ve mühendislik tasarım arasındaki bağlantıyı vurgular. Mühendislik tasarımı ile soruşturma sentez projeleri yapan öğrenciler, onlara kavram ve becerileri fiziğin ve bu becerileri pratik kullanımı arasındaki boşluğu kapatıyor.

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Smart home assistant based on Arduino platform

Abstract:

This research paper describes the overall architecture of small robot called “Smart Home Assistant”. Imagine a situation when you leave home and there is nobody at home or just your kids’ stay at home all alone. In this kind of situations, this robot serves as an assistant for you. Because, it will protect your home from suspicious smells, like gas and fire smells; room temperature changes by informing the owner of this apartment via SMS.

Generally a robot is a mechanical or virtual artificial agent, usually an electro-mechanical machine that is guided by a computer program or electronic circuitry. Robots can be autonomous, semi-autonomous or remotely controlled. By mimicking a lifelike appearance or automating movements, a robot may convey a sense of intelligence or thought of its own. The branch of technology that deals with robots is called robotics. [1] Nowadays, robots do a lot of different tasks in many fields and the number of jobs entrusted to robots is growing steadily. That's why in my opinion one of the best ways how to divide robots into types is a division by their application. There are:

Industrial robots - industrial robots are robots used in an industrial manufacturing environment.

Domestic or household robots - robots used at home.

Medical robots - robots used in medicine and medical institutions.

Service robots – are robots that don't fall into other types by usage. These could be different data gathering robots, robots made to show off technologies, robots used for research, etc.

Military robots - robots used in military. This type of robots includes bomb disposal robots, different transportation robots, reconnaissance drones.

Entertainment robots - these are robots used for entertainment. It starts with toy robots or the running alarm clock and ends with real heavyweights such as articulated robot arms used as motion simulators.

Space robots - this type would include robots used on the International Space Station, Canadarm that was used in Shuttles, as well as Mars rovers and other robots used in space.

School bots - these types of robots assist teachers in getting children more motivated about learning.

Hobby and competition robots – are robots that you create. Line followers, sumo-bots, robots made just for fun and robots made for competition. [2]

This robot is a type of domestic or household robots as it helps you control the house, and helps you to keep a house clean, by vacuuming any rooms inside this house. Moreover, this type of robot has an excellent future since it has a broad use in every field of human life. In near years, every household will have Domestic Bots which then will perform a substantial amount of chores.

The vision of this research is to develop interesting and useful robot, which provides efficiency, usability, reliability and we consider the fact that the user is interested in using this robot.

Efficiency: The robot is effective, because it is very easy to use and is suitable not only for specialized workers, but also for the general population, especially for mothers. And this robot is effective because it inform you when something happens in home. It will effectively protect your home.

Usability: Author thinks that it is the most useful tool in home. It will inform people by sending message, and then people can quickly go home, and then prevent from possible dangerous accidents. And it is useful when your children are all alone at home.

Reliability: The reliability of this project is also provided, because in this robot, there are sensors, each of which performs its own work. And in these sensors, there are ranges of temperature, voltage for signaling. Project is the reliable too, because it does not need to be updated, and anybody can use it for many years.

To construct this robot, the Arduino platform was used. Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. The Arduino project is a fork of the open source Wiring platform and is programmed using an Arduino programming language (Wiring-based (syntax and libraries)), similar to C++ with some slight simplifications and modifications, and a Processing-based integrated development environment (IDE). Also Arduino can sense the environment by receiving input from a variety of sensors and can affect its surroundings by controlling lights, motors, and other actuators. For this research, sensors like gas, microphone, temperature, flame and motion were used. By using these sensors, the robot is enabled to detect gas smells, fire, sound and any unpredictable motion.

In Figure-1 showed connection of Arduino platform and XBee shield. And for using this shield author uses program called “X-CTU” which showed in Figure-2.

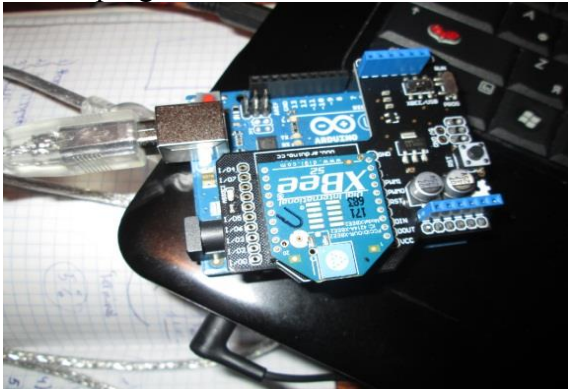


Figure 1- The combo of Arduino microcontroller and Xbee shield

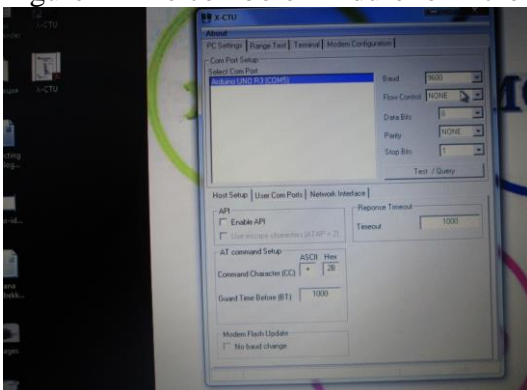


Figure 2- The software package called “X-CTU” for XBee shield.

