



RECNT : Machine Learning Through the Use of Ozobot Evo



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Introduction

Machine learning is an exciting field of computer science that is still in its infancy stages. The act of seeing and identifying objects is something humans can do easily without much thought, yet not a simple task for robots. Have you ever wondered how your cell phone camera can detect faces in a picture automatically, and then focus in on them? What about how self-driving cars sees the road? Neither one of these computers have eyes but with a little human ingenuity people have taught computers to use camera images to sense their surroundings, and program self-driving cars to allow the sensors to detect and avoid objects and learn how to maneuver around shapes or line track to stay on the road. With the use of our Ozobot Evo, we will explore how robots can be coded to move from one space on a map to another detecting or seeing objects and obstacles along the way.

Objectives

Students will be able to:

Explore and extend the concept of machine learning through the coding of sensors on Ozobot Evo

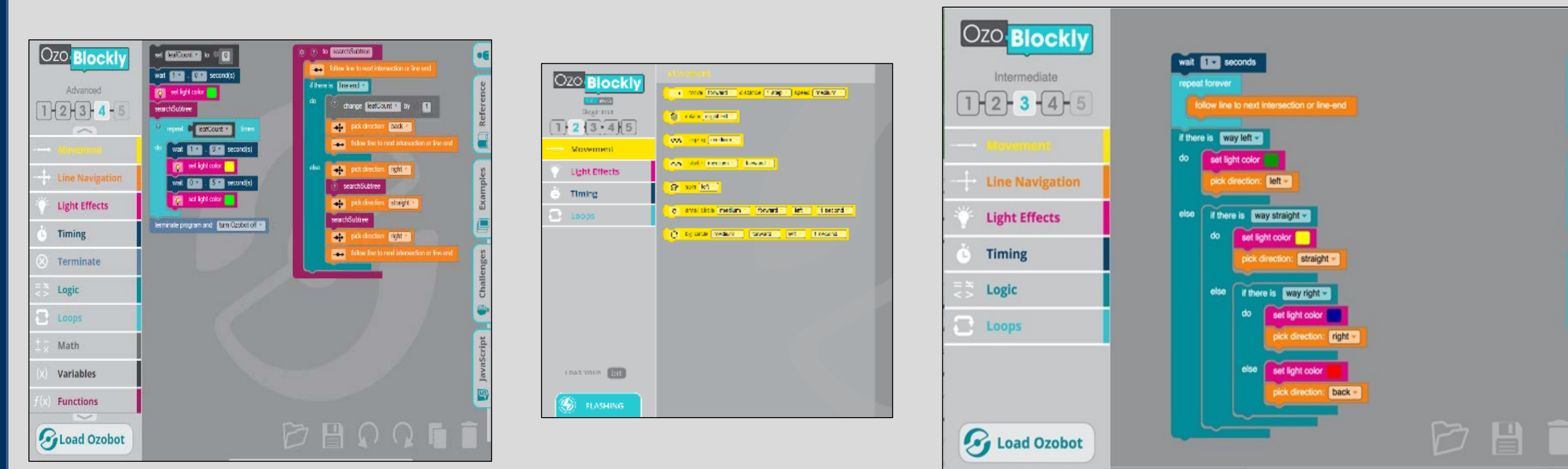
Understand that coding algorithms are used to create a series of instruction in a specific order in order for the robot to perform a task

Extend the code into segments in a specific order for each task to protect the integrity of the robot's programming from being vulnerable to an outside threat?

Ozobot EVO



Ozoblockly



Standards

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

6-8.AP.A.1. Use flowcharts and/or pseudocode to address complex problems as algorithms

6-8.CS.HS.1 Design and evaluate projects that combine hardware and software components to collect and exchange data.

Activity

Students will be required to research the sensors Ozobot Evo possesses and then create a map on a 30-inch-by-30-inch piece of paper utilizing the different sensors.

Students will plan the layout of their maps. This will include the start and end point that must be at opposite ends of the paper. Based on the information discovered about each sensor it is important that students choose which sensors to use and what location it will be used on the map. It is imperative that students have a plan before starting work on the poster paper and coding.

Once student have a plan they can begin working on segmenting their code. From point, one to point two this is the code and from point two to point three this is their code. If possible have a color printer and allow students to print out their code and adhere it to the poster between each point so you can see what segments were created and if it was successful.

Student will work with an Ozobot Evo for 15 minutes and fill in the top two boxes of the graphic organizer. Allow an additional ten minutes for the last box. During the activity, students will use a similar graphic organizer for documentation and explaining their thinking process for coding each segment on their maps.

Make a list of sensors Ozobot has:	Explain how you found the sensor:	Make a list of sensors Ozobot has:	Explain how you plan to use each sensor in your project:
From your list of sensors - explain what task each one can complete		From your plan - explain what task each sensor completed	