

Clafin University Outreach Report
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0.1 Introduction

Positive first experiences is a key to attracting youth into the STEM education and occupations. Our Swarmathon team partnered with a local nonprofit and schools in the region to teach and promote computer science and robotics education. We felt that while high schools are a critical outreach population we also wanted to make sure our efforts were directed toward younger students as well. Our activities were divided then into two categories, inspiration and instruction.

0.2 Outreach Activities

0.2.1 Inspiration

In order to encourage younger students to engage in STEM, we took one of our swarmie bots to Mellichamp Elementary School. From the moment we walked in the door until the moment we left students were completely enamored by the robot. Before we could even walk into a classroom we were bombarded with questions, yet encouraged to see the passion in each students eyes.

We began our inspiration sessions by showing students a brief history of robotics culminating with a video of Google's Self Driving Car and a demonstration of the Parrot A.R Drone. Afterwards we showcased the swarmie bot and explained the hardware that powers the robot. Students were thrilled by the capabilities of the robot and wanted to learn as much as possible about every part and function. The positive exposure was so thrilling for the elementary school students that they demanded we teach them to build their own robots.

Participating Students: 10

0.2.2 Instruction

We took students from a local National Society of Black Engineers Jr. (NSBE Jr.) chapter and began teaching them python programming at the county library. We taught students the foundation of coding and some basic data structures through robotics challenges. Students wrote and tested code on a browser based python robotics simulator developed by the Technical University of Munich. Each student was tasked with programming a robot in a simulator over various navigation barriers.

Participating Students: 7

0.3 Continuation of Activities

By leveraging existing partnerships in the community we will continue to engage in providing STEM instruction for youth in the Orangeburg, SC area.

0.3.1 Summer Robotics Institutes

With such a great demand for robotics education among students in the area, we will host robotics workshops in cooperation with AI In Action, Mellichamp Elementary, Clark Middle School, and Orangeburg-Wilkinson High School. Each workshop will last for one week and provide students with skills in programming, problem solving, and mathematics.

Mellichamp Elementary

Students will learn robotics from the very foundation. By the end of the week students will be able to articulate some of the major advances in robotics and will have built their own robot using a motor, batteries, and a few household items.

Participation Goal: 20 students

Clark Middle School

At the middle school level each student will learn the fundamentals of programming with python. Over the course of the week students will apply their programming skills to programming an arduino micro-controller to manipulate the world around them.

Participation Goal: 20 students

Orangeburg-Wilkinson High School

In the high school program, students will also learn the fundamentals of programming with python. Students will be tasked with using their programming skills to read sensor and manipulator data from the Swarmie.

Participation Goal: 20 students

0.3.2 Fall Robotics Immersion

In partnership with Bethune Bowman High School, students from the Swarathon team will assist with instructing teaching a weekly out-of-school time program centered on robotics. High school students will learn to programming and elementary data structures. The instruction will be centered around applying programming to robotics. By the end of the course students will be able to perform simple navigation on the Swarmie to solve problems.

Participation Goal: 15 students

0.4 Team Member List

Stephanie Wyche

Pradip Khanal

Sakshyam Dahal

Stuart Barron

Dominic Bett

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Emmanuel Mong

Jibril Burleigh

Austin Moss

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