**AOLME CURRICULUM LEVELS 1 AND 2**

***Level 1***

***S.1 Basics of Raspberry Pi and Linux (MSP-CLL)***

* Explore and discuss how computers work inside and how information flows in a computer system.
* Utilize the components and functions of a Raspberry Pi.
* Practice assembling components and cables of a computer system.
* Access and navigate the filesystem using Linux.

***S.2 Introduction to Python Programming (MSP)***

* Apply basics of Python Programming.
* Program basic operations and variables in Python.
* Solve and create own operations, and arithmetic-algebraic expressions.
* Program a number guessing game using Python.

***S.3 Algorithms (SCP)***

* Introduce students to the notion of algorithm and its relevance.
* Understand the link of algorithms and mathematics.
* Become familiar with pseudocodes, flowcharts, loop control statements, and conditional control statements in Python.

***S.4 The Coordinate Plane and Black & White Images in Python (CLL)***

* Identify the connections between x-y coordinate plane and use of binary numbers to represent black and white images.
* Design basic black and white images.

Program binary images using Python

***S.5 Binary and Hexadecimal number systems (CLL)***

* Develop connections and number sense across decimal, binary, and hexadecimal systems.
* Identify real-world applications of binary numbers.
* Convert number values across systems

***S.6 Images and Their Components (CLL)***

* Represent grayscale and color images using RGB.
* Manipulate real images (taken by a digital camera).
* Open an image file in Python and get familiar with the AOLME Python Library.
* Link the development of images with binary and hexadecimal numbers.

***S.7 Creation of Images and Video (SCP)***

* Create, code, and display black and white, grayscale, and color images using Python.
* Learn how to create a digital color video using own images.

***Level 2***

***S.1 Challenges***

* Review basics of image and video representations
* Collaboratively analyze code and program basic operations and variables in Python

***S.2 Object Orientated Programming Using Sprites***

* Practice basics of Object Orientated Programming
* Create a sprite from its parts
* Make multiple copies of a sprite in a single video frame
* Create a sprite and its parts from an existing character

***S.3. Transformations***

* + Move sprites around by applying Transformations, Rotations, and Flips to sprites
  + Delete and add parts to sprites
  + Apply functions

***S.4. The Travelling Salesperson Problem***

* To review and apply the Pythagorean theorem
* Find the most efficient solution to the travelling salesperson problem
* Program the solution using Python

***s.5 Basics of Image Analysis***

* Introduce students to computer vision.

Use inequalities and histograms to find color objects in an image