**Volumetric 3D Display Module Requirements**

**Background**

Volumetric displays have been used in medical imaging, advertising, simulation, video gaming and more. The ability to project a 3D image is possible by taking advantage of the human persistence of vision. An example of this for this project would be spinning LEDs at a minimum of 1800 revolutions per minute, such that the human eye cannot comprehend individual LEDs at a single point. When we combine this effect with the precise control of on/off patterning of the LEDs we create an illusion of a fixed image being formed.

**Project Description**

A volumetric 3D display module is a spinning array of LEDs that will project a 3D image that appears to be floating in the air. This will be done by taking advantage of the persistence of vision effect mentioned earlier in this document.

**Objective**

Design a low cost, fairly flat designed 3D display module that will be used as a subsystem suitable for the integration into gaming applications.

**Product Design**

**Needs:**

* Low-Cost: Less than or equal to $150/module
* 3D display module (2x)
* Portable:
  + Flat - Less than 3 inches in height
  + Circular with a diameter of less than 7 inches
* Project a single image of a 3D object about no less than 2” in diameter
* Uses a ring motor to spin the linear array of LEDs at no less than 1800 rpm to induce “persistence of vision” effect
* Easy 3D image transferring interface - sd card, wireless, or USB
* High LED quality for bright environments
* On/off control via incorporation of motion sensor control to turn off the display via “waving” above the module
* Safe and easy to use (ie: no sharp edges)

**Maybe**

**Design Specifications:**

* LEDs -
  + APA102 2020 - Smart RGB LEDs
* Ring Motor -
* Gesture Sensor -
  + VCNL4020-GS08
* Arduino
* ESC 30A
* Processor

**Competition:**