A Low-Cost Approach to Handheld Laser Diode Communication

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While we often take the Internet for granted, millions of citizens in the US - and billions worldwide - still do not have access to high-speed broadband internet. In order to try to remediate this problem, a Free Space Optical Communications (FSOC) design was created that uses a pair of Arduinos and handheld laser diodes to send information across the air to an array of photodiodes, thus allowing for each Arduino to wirelessly communicate with each other. In order to combat potential noise caused by weather phenomena, a Printed Circuit Board and apparatus was designed to identify the location the laser hit the array of photodiodes and mechanically realign the laser to the center of the array. Using this design, the connection was found to sustain a high uptime, bitrate, and low Bit Error Rate while in less-intense weather. With further additions and modifications, this approach to FSOC technology represents a possible cost-effective alternative to other methods.

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