Target Designation with Infrared Laser and Tracking System

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The purpose of our Project is to track a remotely designated target. It can be assumed as a basic simulation for the seeker part of a laser guided missile. Our Project consists of three components, which are a designator, our special design that tracks the designated target, and a computer running Matlab® software. We use the designator to designate the target that we want our system to track. In our Project we used a laser that emits light at the wavelength of 980nm. Since it's in the invisible spectrum of light for the human eye, the target is not aware of being designated. However we can see our designated target because we use an infrared camera. With using a designator we designate a target, which we want to track. On our special design platform we have an infrared camera. Using this camera we get the image of our designated target and send it to our computer through RF video transmitter in order to process the image. After image processed on Matlab® we detect the target's current elevation and azimuth angles with the help of an algorithm that was built up by ourselves. These angles are packed in a string of data and send this data package to the microcontroller via Bluetooth. The microcontroller receives this data and generates necessary signals for the motors to be positioned at the precalculated angles. The motors turn at those angles to aim our special design platform's direction on the target. This process cycles 20 times in a second. The recursive process is continuously done to have the designator laser spot in the center of the image that is taken from the camera, since the position of the target changes through the time.

Awards Won:

Fourth Award of $500