Enhancing Target Efficiency of Laser by the Integration of a Stabilization System

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The objective of this study was to improve the accuracy of laser pointing by stabilizing the beam to stay constant on a specific target. To increase accuracy and stabilize the laser, a laser detection and stabilizer system was created. The computer programs Labview and NI Vision Acquisition Module, by National Instruments, were used in this investigation. The above-mentioned programs were used to create a driver that allows the system to continuously complete specific tasks. The system itself consists of a webcam, mirror, motorized mirror mount, and a computer. The webcam captures the position of the laser and calculates the laser's center of mass (the position is represented by coordinates on a Cartesian plane); Feedback is then sent to the mirror mount to correct the drift. The mirror mount controls the direction of the laser by corresponding to the analyzed destination sent by the webcam. If the laser starts to drift away from the target, the center of mass calculation will change. As soon as the center of mass coordinates change by 0.2 decimals, the mirror mount redirects the laser back to the target. System feedback charts were added to the program to ensure proof and accuracy of laser stabilization. This system is now used to improve the overall accuracy of the laser pointing stability's active feedback.