Laser Projector

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The objective of our project is to produce a laser based video projector which intakes a VGA signal and outputs a monochromatic laser image. The FPGA would read pixel by pixel the input from the VGA and then determine the correct angle and laser modulation based on pixel luminance intensity using a commanded distance to the target wall. On the hardware side this will include an off the shelf motor mirror system to control X/Y axis beam steering. It will also use a low side driver on the laser to control laser intensity via PWM. In addition we will implement the conversion of analog VGA input, using the onboard ADC, to create a frame grab for other modules to use in producing the projection.

As a stretch goal we would like our project to use an off the shelf range-finding module to scale the projection. Additionally for higher frame rate and brightness a vectorization module will be used to convert the VGA video into outlines to be projected and drawn.