For my senior project, I am working on a project that involves tracking a target with a laser that is guided by a three-prism system. The target position is determined by two coordinates and each prism is specified by a single rotation coordinate. Thus, the prism system is over-determined for tracking the target (i.e. there are infinitely many prism arrangements capable of locating a fixed target position). The decision to use an over-determined system has been made because it allows flexibility in dealing with singular points in the field of view and as well as minimizing any problems associated with manufacturing imperfections in the prisms.

My project is to develop a computer algorithm that is able to optimize the prism tracking system so that tracking can occur at the fastest possible speed. Since the system is over-determined, the goal of speed optimization can be met if the largest of the three prism angle displacements can be minimized for each target displacement. Achieving this goal will also require identifying singular points in the field of view that require large prism angle displacements and devising methods to minimize the greatest displacement near these locations.

I will deliver a computer program written in either Mathematica or C with the optimization algorithm, a paper describing the project and my oral presentation.

Mark Kerfoot

Sac State Physics Major, Senior Project Presentation

Thursday, May 15, 2008
4:20-5:30 PM  MND 1015

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