Development of V-Lab Module: Virtual 3D Optical Ray Generator

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Project Description: As many of emerging products such as Lytro’s after focusing Camera, and MS-hologram computing device indicate, literacy with optical simulation code and understanding how optical system works by using the code is essential skill and knowledge sets for students in electrical engineering who have desire to conduct research in interdisciplinary manner. Such skill and knowledge sets can be obtained by taking graduate level classes, such as OPTI502, 516 offered at the University of Arizona. Alternatively, we offer research opportunity to motivated undergraduate students to acquire knowledge and skill sets of optics while developing hand-on skill sets such as controlling lasers, motorized stages and cameras by LabView.

During the 10 weeks of research period, student develops “3D Ray Generator” which consists of laser light sources, computer generated holograms, acrylic lenses, motorized stages, smoke chamber and cameras. All the components are controlled by LabView program such that optical simulation results is visualized as a trajectory of laser inside the smoke chamber. The image of the ray captured by two cameras are transferred to smartphones so that user can operate camera to see a 3D image of ray trajectory with simple goggles which is developed by related RiO project, Development of v-Lab (TM) module: Virtual 3D Ray Visualizer.

Required Skills:
- Basic knowledge of LabView
- Basic Knowledge in Electrical Engineering

Ideal Skills:
- Advanced knowledge of LabView
- Basic knowledge in Mechanical Engineering