

# **Multi-Platform Optics and Photonics Educational Application with User Data Analytics**

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Optics and Photonics is a difficult subject, often only lightly brushed upon by many educators. Usually, students do not see these topics in any capacity until their first year of college. Even then, it is often only briefly covered due to a lack of time. Optics and Photonics is an important field of physics, and it is important for students to be adequately exposed and educated to these subjects. Doing so may spur interest in certain individuals to focus their studies in this field. Thus, the goal of this project is to develop an educational platform aimed at facilitating the development of a strong understanding of the basic principles of optics and photonics. The platform places a heavy emphasis on graphical paraxial ray-tracing, which is the method used and taught by many professors in order to determine the formation of images by various optical elements. While introducing fundamental ideas in stages, the platform will transition from short, explanatory demonstrations to testing of the user's accumulated knowledge. Finally, the platform will allow the user to experiment in a simulator to fully cement their understanding of the subject at a pace they are comfortable with. In addition to teaching students, the platform will be capable of recording user feedback and information to be used in improving the application's educational content, as well as identifying problem areas in the subject material. The application is in a functional state, with several of the fundamental classes and modules in continuous development.