

Discontinuous free-form lens design for prescribed irradiance

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Abstract

For the problem of point source forming prescribed irradiance, a new, to the best of our knowledge, method-variable separation mapping method is presented, which establishes separately the correspondence between variables on the light source and the target plane. The role played by the optical surfaces is then to redirect the light rays to their corresponding target points. The surface of the lens is determined by first calculating the surface points and then their normal vectors. Considering that normal deviations are produced in the surface construction process, a normal deviation control method is also presented to restrict the deviation. With this normal deviation control method, discontinuities are introduced onto the lens surface. From these mapping and normal control methods, a fast and efficient algorithm has been developed for several prescribed irradiance problems with simple nonrotational shape of the illuminated region.

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We proposed an approach to design a freeform LED lens for forming uniform rectangular illumination from a point Lambertian source based on a new source-target mapping. The new source-target mapping we present can be obtained analytically and the system geometry allows separation of variables. According to the Snell's law and the source-target mapping, we can get a first-order partial differential equation set. The freeform lens then can be constructed by solving these PDEs numerically. The simulated results showed that we can get a good uniformity of illumination, and a good rectangular t Iterative freeform lens design for prescribed irradiance on curved target. Article. Jan 2020. We proposed an approach to design a freeform LED lens for forming uniform rectangular illumination from a point Lambertian source based on a new source-target mapping. The new source-target mapping we present can be obtained analytically and the system geometry allows separation of variables. According to the Snell's law and the source-target mapping, we can get a first-order partial differential equation set. Prescription contact lenses do not however mean you always need to show a prescription in order to purchase your . . . Show More >. Contact lenses made to conform to glasses prescription may lead to vision imperfections & added strain on your eyes. Since glasses stay at a distance of 12mm and contact lenses sit directly on your eyes; the prescription of glasses will be stronger for contact lenses. Prescription contact lenses do not however mean you always need to show a prescription in order to purchase your supply. Your optometrist is bound to provide you a written copy of your prescription by law upon your request. Lin Wang, Keyuan Qian, and Yi Luo, "Discontinuous free-form lens design for prescribed irradiance," Appl. Opt. 46, 3716-3723 (2007). For the problem of point source forming prescribed irradiance, a new, to the best of our knowledge, method-variable separation mapping method is presented, which establishes separately the correspondence between variables on the light source and the target plane. The role played by the optical surfaces is then to redirect the light rays to their corresponding target points. The surface of the lens is determined by first calculating the surface points and then their normal vectors. For the problem of point source forming prescribed irradiance, a new, to the best of our knowledge, method-variable separation mapping method is presented, which establishes separately the correspondence between variables on the light source and the target plane. The role played by the optical surfaces is then to redirect the light rays to their corresponding target points. The surface of the lens is determined by first calculating the surface points and then their normal vectors. From these mapping and normal control methods, a fast and efficient algorithm has been developed for several prescribed irradiance problems with simple nonrotational shape of the illuminated region.