

## عنوان مقاله:

Optimized Design of Nanohole Array-Based Plasmonic Color Filters Integrating Genetic Algorithm with FDTD Solutions

## محل انتشار:

مجله هوش مصنوعی و داده کاوی، دوره 7، شماره 2 (سال: 1398)

تعداد صفحات اصل مقاله: 8

## نویسندگان:

F. Fouladi Mahani - *Optical and RF Communication Systems (ORCS) Lab, Department of Electrical Engineering, Shahid Bahonar University, Kerman, Iran*

A. Mahanipour - *Optical and RF Communication Systems (ORCS) Lab, Department of Electrical Engineering, Shahid Bahonar University, Kerman, Iran*

A. Mokhtari - *Optical and RF Communication Systems (ORCS) Lab, Department of Electrical Engineering, Shahid Bahonar University, Kerman, Iran*

## خلاصه مقاله:

Recently, significant interest has been attracted by the potential use of aluminum nanostructures as plasmonic color filters to be great alternatives to the commercial color filters based on dye films or pigments. These color filters offer potential applications in LCDs, LEDs, color printing, CMOS image sensors, and multispectral imaging. However, engineering the optical characteristics of these nanostructures to design a color filter with desired pass-band spectrum and high color purity requires accurate optimization techniques. In this paper, an optimization procedure integrating genetic algorithm with FDTD Solutions has been utilized to design plasmonic color filters, automatically. Our proposed aluminum nanohole arrays have been realized successfully to achieve additive (red, green, and blue) color filters using the automated optimization procedure. Despite all the considerations for fabrication simplicity, the designed filters feature transmission efficacies of 45-50 percent with a FWHM of 40 nm, 50 nm, and 80 nm for the red, green, and blue filters, respectively. The obtained results prove an efficient integration of genetic algorithm and FDTD Solutions revealing the potential application of the proposed method for automated design of similar nanostructures

## کلمات کلیدی:

Genetic Algorithm, FDTD Solutions, Nanohole Arrays, Plasmonic Color Filters, Aluminum nanostructures

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/894060>

