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Optical applications of Fourier transform

This speech will cover our work on the application of Fourier optics in different areas. Many researches done in the field of applied Fourier transform in optics as; image processing, transformation, representation and coding, smoothing and sharpening images. In data analysis, we used Fourier transform as high, low and band pass filters. We focused our research in the application of Fourier optics to image analysis as the Fourier optics is an important image processing tool which is often two dimensional Fourier transform. Our research started from simple lens and its Fourier transform to complex systems including spatial filters, character recognition, pattern recognition and image enhancement and noise reduction methods using coherent an incoherent optical processing.

Real time optical Fourier transform is one of our interest and works done on static and dynamic images. Restoring transmitted images through inhomogeneous media, images transmitted by laser beam in free space that faces distortion, the

image restoration done using Fourier transform optically in real time and off line digitally. In UK-scientific ltd. We introduced seven experiments using Fourier transform and its application to image processing, image convolution, image pass filtering, special filtering, imaging addition, image subtraction, image differentiation, 4f system, image recognition, optical correlation. And using liquid crystal as an image input.

Through those kits student can get a better understanding of the principles of optical image differentiation. And also those kits can be used by researchers too.

Speaker Biography

Riyadh Mirza has a PhD in applied physics. He worked as chief researcher in applied optics, and as a professor of fourier optics in the institute of laser for post graduate studies in the university of Baghdad/Iraq. He is a director of UK-Scientific ltd which he formed in 2009 investing his over forty five years' experience in new education kits in optics and photonics. He is also a member of the institute of laser board in the University of Baghdad, Iraq.

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