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Editorial

Various Approaches for Generalized Integral Transforms

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Integral Transform maps an equation from its original domain into another domain where it might be manipulated and solved much more easily. In this research area, our main objective of this special issue is to address some of the new and interesting engineering and applied science research problems. Although the theory of Integral Transform is not new, we think it is still worthy of further research in an application point of view, such as convolution in convolutional neural networks (CNN) or medical diagnosis image processing. Computed tomography or magnetic resonance imaging can be viewed as successful applications of the typical Integral Transform.

Theories on Integral Transforms have been studied in the form of creating a new type of transform by suitably changing the kernel. There are two views here. One is the view to see many Integral Transforms in this field as a variant of Laplace transform, and the other is to view it as a new transform. We consider the former to be a valid view.

Here, in this editorial, we describe the status of the special issue as follows.

Overall, eight research papers have been submitted to this special issue, of which four research papers have been selected for publication.

In the paper "Some General Integral Operator Inequalities Associated with φ-Quasiconvex Functions," the authors Y. C. Kwun et al. deal with generalized integral operator inequalities which are established by using φ-quasiconvex functions. Bounds of an integral operator are established which have connections with different kinds of known fractional integral operators. All results are deducible for quasiconvex functions. Some fractional integral inequalities are deduced.

The research paper submitted by A. K. Rathie et al., entitled "A Note on Certain Laplace Transforms of Convolution-Type Integrals Involving Product of Two Generalized Hypergeometric Functions" provided as many as forty-five attractive Laplace transforms of convolution type related to the product of generalized hypergeometric functions.

In the research paper "Combining Finite Element and Analytical Methods to Contact Problems of 3D Structure on Soft Foundation," C. Su et al. proposed a method to analyze the structural soft foundation system affected by time. The methodology is an explicit method, combining the finite element method with the analytical method. The creep deformation of the soft foundation is obtained based on Laplace transform. The structural deformation contains the statically determinate structural deformation and rigid body displacement, solved by the finite method. The contact forces are calculated by the deformation coordination equations and equilibrium equations. The methodology is validated through the augmented Lagrangian (AL) method. The results can clearly illustrate the local disengagement phenom, greatly overcome the nonconvergence of the iteration, and significantly improve the computing efficiency.

In the research paper "Facial Image Segmentation Based on Gabor Filter," H.-A. Li et al. used the AdaBoost algorithm and the Gabor texture analysis algorithm are used to segment an image containing multiple faces, which effectively reduces the false detection rate of facial image segmentation. In facial image segmentation, the image containing face information is first analyzed for texture using the Gabor algorithm and appropriate thresholds are set with different thresholds of skin-like areas, where skin-like areas in the

image's background information are removed. Then, the AdaBoost algorithm is used to detect the face regions, and finally, the detected face regions are segmented. Experiments show that this method can quickly and accurately segment the faces in an image and effectively reduce the rate of missed and false detections.

In our view, research on the intrinsic properties of Integral Transforms, application to convolution of artificial intelligence, and research on Radon transform related to medical equipment are judged to be of high value. Finally, we believe that the results published in this special issue would be a definite contribution in the existing literature of the Integral Transform and will be useful for the mathematicians and research scholars working in this area. We look forward to seeing a lot of further research in these areas in the coming days.

Conflicts of Interest

The Guest Editors declare no conflicts of interest.

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