Department of Mathematics
National University of Singapore
Level 4, Block S17
10 Lower Kent Ridge Road
Singapore 119076

July 31, 2019

Editorial Board
Applied and Computational Harmonic Analysis

Dear members of the Editorial Board:

I would like to submit the manuscript entitled "Fast Algorithms for the Multi-dimensional Jacobi Polynomial Transform" by James Bremer, Qiyuan Pang, and myself to Applied and Computational Harmonic Analysis.

We use the well-known observation that the solutions of Jacobi's differential equation can be represented via non-oscillatory phase and amplitude functions to develop a fast algorithm for computing multi-dimensional Jacobi polynomial transforms. More explicitly, it follows from this observation that the matrix corresponding to the discrete Jacobi transform is the Hadamard product of a numerically low-rank matrix and a multi-dimensional discrete Fourier transform (DFT) matrix. The application of the Hadamard product can be carried out via $O(1)$ fast Fourier transforms (FFTs), resulting in a nearly optimal algorithm to compute the multidimensional Jacobi polynomial transform.

Thank you very much for your attention and please let me know if there is anything else I can help with.

With best regards,

Haizhao Yang