School of Mathematical and Statistical Sciences
Arizona State University

M E M O R A N D U M

DATE: 06/08/2023

TO: Faculty and Students

FROM: Professor(s) Malena Espanol
Chair/Co-Chairs of Jordan Dworaczyk
Defense for the MA in Mathematics
Committee Members
Bruno Welfert
Rodrigo Platte

DEFENSE ANNOUNCEMENT

Candidate: Jordan Dworaczyk

Defense Date: Friday, June 23, 2023

Defense Time: 1:00 PM

Virtual Meeting Link: https://asu.zoom.us/j/83079377454 Live Attendance: WXLR 102

Title: Variable Projection Method for Semi-Blind Deconvolution with Mixed Gaussian Kernels

Please share this information with colleagues and other students, especially those studying in similar fields. Faculty and students are encouraged to attend. The defending candidate will give a 40 minute talk, after which the committee members will ask questions. There may be time for questions from those in attendance. But, guests are primarily invited to attend as observers and will be excused when the committee begins its deliberations or if the committee wishes to question the candidate privately.

ABSTRACT
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ABSTRACT

The variable projection method has been developed as a powerful tool for solving separable nonlinear least squares problems. It has proven effective in cases where the underlying model consists of a linear combination of nonlinear functions, such as exponential functions. In this thesis, a modified version of the variable projection method to address a challenging semi-blind deconvolution problem involving mixed Gaussian kernels is employed. The aim is to recover the original signal accurately while estimating the mixed Gaussian kernel utilized during the convolution process. The numerical results obtained through the implementation of the proposed algorithm is presented. These results highlight the method's ability to approximate the true signal successfully. However, accurately estimating the mixed Gaussian kernel remains a challenging task. The implementation details, specifically focusing on constructing a simplified Jacobian for the Gauss-Newton method, is explored. This contribution enhances the understanding and practicality of the approach.