

**Time Frequency Distribution Associated with Adaptive Fourier
Decomposition and Its Variation**

by

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**A thesis submitted in partial fulfillment of the
requirements for the degree of**

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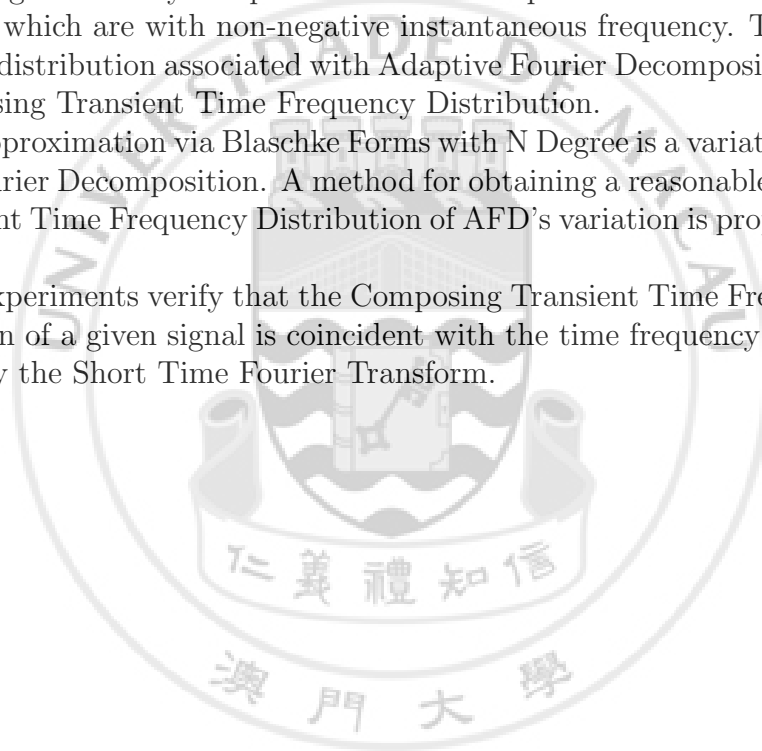
Abstract

Time frequency distribution is a powerful tool in signal processing. Many methods for obtaining a time frequency distribution of a signal have been developed in recent decades. The Short Time Fourier Transform is the most widely used one, however it just can show us the sketch of time frequency distribution. No one knows what the exact time frequency distribution of a given signal is, and people make efforts to find it out.

In this thesis, a new time frequency distribution of a signal is considered, and it is obtained by Adaptive Fourier Decomposition. Adaptive Fourier Decomposition is a method with a rigorous mathematics formulation, and all components generated by Adaptive Fourier Decomposition are mono-component signals, which are with non-negative instantaneous frequency. The time frequency distribution associated with Adaptive Fourier Decomposition is called Composing Transient Time Frequency Distribution.

Best Approximation via Blaschke Forms with N Degree is a variation of Adaptive Fourier Decomposition. A method for obtaining a reasonable Composing Transient Time Frequency Distribution of AFD's variation is proposed in this thesis.

Some experiments verify that the Composing Transient Time Frequency Distribution of a given signal is coincident with the time frequency distribution given by the Short Time Fourier Transform.



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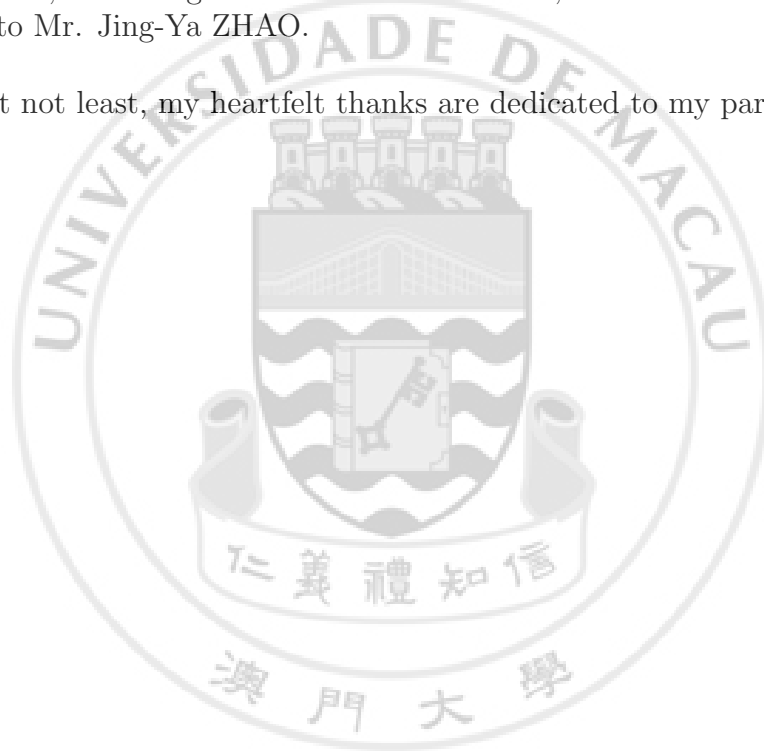


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DECLARATION

The author declares that this thesis represents his own work with Professor Tao QIAN, the author's supervisor. All the work is done under the supervision of Professor QIAN during the period 2010-2012 for the degree of Master of Science in Mathematics at the University of Macau. The results in this thesis, unless otherwise stated or indicated, have not been previously included in any thesis, dissertation or report submitted to any institution for a degree, diploma or other qualification, or for publication by the author, and to the author's knowledge, by anyone else.



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