

Spline Multiwavelets

PROJECT DESCRIPTION

"The topic of spline multiwavelets belongs to mathematics. Being piecewise polynomials, spline functions have been widely studied in mathematics and have many applications in industries such as the aircraft design, geometric modeling and computational mathematics. Multiwavelets are of interest for their applications in wavelet-based numerical solutions of differential equations. Multiwavelets are derived from refinable vector functions through the standard theory of wavelet analysis. Therefore, it is often great interest in both theory and application to study and construct spline refinable vector functions or more generally piecewise polynomial refinable vector functions with some desired mathematical properties. The ultimate goal of this project is to provide a complete characterization of spline refinable vector functions through their associated refinement filters/masks.

In this project, we shall study some mathematical properties of spline refinable vector functions. In particular, we shall study when a general refinable vector function is indeed a spline function. In particular, we shall examine the family of interpolating or approximately interpolating refinable vector functions and determine when they are spline functions as well.

The main task of this project is to discover new spline refinable vector functions and their associated spline multiwavelets. The student should have a strong background in mathematics, in particular, background in calculus and analysis. Some programming skill/knowledge is helpful but not required."

FACULTY-DEPARTMENT

Sciences - Mathematical and Statistical Sciences

DESIRED FIELD OF (STUDENT) STUDY

Mathematics

INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

NUMBER OF INTERNSHIP POSITIONS

2

INTERNSHIP START DATE

The start date is flexible

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INTERNSHIP END DATE

The end date is flexible

ARE THE DATES FLEXIBLE?

Yes, I am flexible regarding the internship dates. Selected students can contact me to request a date change.