TrgSum

Generated by Doxygen 1.8.13

Contents

Chapter 1

Project "Trigonometrix sums"

Author

Przemyslaw Stpiczynski

The package contains sequential and vectorized implementations of Goertzel and Reinsch algorithms for finding trigonometric sums:

C(x) = b_0 cos(0) + b_1 cos(x) + b_2 cos(2x) +...+ b_n cos(nx)

S(x) = + b_1 sin(x) + b_2 sin(2x) +...+ b_n sin(nx)

Chapter 2

Bug List

File trgsum.c

No know bugs.

File trgsum.h

No known bugs.

Chapter 3

File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 4

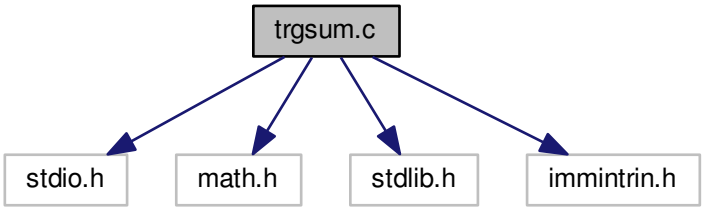
File Documentation

4.1 trgsum.c File Reference

Implementation of the package.

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include "immintrin.h"
```

Include dependency graph for trgsum.c:



Functions

- __inline void **vec8x8_transpose** (__m512d *col0, __m512d *col1, __m512d *col2, __m512d *col3, __↩ m512d *col4, __m512d *col5, __m512d *col6, __m512d *col7)
- void trg_d_s_goertzel (double x, int n, double *b, double *cx, double *sx)

  Implementation of basic sequential Goertzel algorithm.
- void trg_d_v_goertzel (double x, int n, double *b, double *cx, double *sx)

  Implementation of vectorized Goertzel algorithm introduced by Stpiczynski.
- void trg_d_s_reinsch (double x, int n, double *b, double *cx, double *sx)

  Implementation of basic sequential Reinschalgorithm.
- void trg_d_v_reinsch (double x, int n, double *b, double *cx, double *sx)

  Implementation of vectorized Reinsch algorithm introduced by Stpiczynski.

4.1.1 Detailed Description

Implementation of the package.

The file contains implementation of all functions.

Author

Przemyslaw Stpiczynski

Bug No know bugs.

4.1.2 Function Documentation

4.1.2.1 trg_d_s_goertzel()

```
void trg_d_s_goertzel (
            double x,
            int n,
            double * b,
            double * cx,
            double * sx )
```

Implementation of basic sequential Goertzel algorithm.

Parameters

x	Argument for C(x) and S(x)
n	Number of coefficients, b_0,...,b_n
b	Pointer to coefficients
cx	Pointer to computed C(x)
sx	Pointer to computed S(x)

Returns

void

4.1.2.2 trg_d_s_reinsch()

```
void trg_d_s_reinsch (
            double x,
            int n,
            double * b,
```

```
            double * cx,
            double * sx )
```

Implementation of basic sequential Reinschalgorithm.

Parameters

x	Argument for C(x) and S(x)
n	Number of coefficients, b_0,...,b_n
b	Pointer to coefficients
cx	Pointer to computed C(x)
sx	Pointer to computed S(x)

Returns

void

4.1.2.3 trg_d_v_goertzel()

```
void trg_d_v_goertzel (
             double x,
             int n,
             double * b,
             double * cx,
             double * sx )
```

Implementation of vectorized Goertzel algorithm introduced by Stpiczynski.

Parameters

x	Argument for C(x) and S(x)
n	Number of coefficients, b_0,...,b_n
b	Pointer to coefficients (should be allocated using _mm_malloc())
cx	Pointer to computed C(x)
sx	Pointer to computed S(x)

Returns

void

4.1.2.4 trg_d_v_reinsch()

```
void trg_d_v_reinsch (
             double x,
             int n,
             double * b,
             double * cx,
             double * sx )
```

Implementation of vectorized Reinsch algorithm introduced by Stpiczynski.

Parameters

x	Argument for C(x) and S(x)
n	Number of coefficients, b_0,...,b_n
b	Pointer to coefficients (should be allocated using _mm_malloc())
cx	Pointer to computed C(x)
sx	Pointer to computed S(x)

Returns

void

4.2 trgsum.h File Reference

Function prototypes for the package "Trigonemetric sums".

Functions

- void trg_d_s_goertzel (double x, int n, double *b, double *cx, double *sx)
  Implementation of basic sequential Goertzel algorithm.
- void trg_d_v_goertzel (double x, int n, double *b, double *cx, double *sx)
  Implementation of vectorized Goertzel algorithm introduced by Stpiczynski.
- void trg_d_s_reinsch (double x, int n, double *b, double *cx, double *sx)
  Implementation of basic sequential Reinschalgorithm.
- void trg_d_v_reinsch (double x, int n, double *b, double *cx, double *sx)
  Implementation of vectorized Reinsch algorithm introduced by Stpiczynski.

4.2.1 Detailed Description

Function prototypes for the package "Trigonemetric sums".

It contains sequential and vectorized implementations of Goertzel and Reinsch algorithms for finding trigonometric sums:

```
C(x) = b_0 cos(0) + b_1 cos(x) + b_2 cos(2x) +...+ b_n cos(nx)
S(x) =              b_1 sin(x) + b_2 sin(2x) +...+ b_n sin(nx)
```

Author

Przemyslaw Stpiczynski

Bug No known bugs.

4.2.2 Function Documentation

4.2.2.1 trg_d_s_goertzel()

```
void trg_d_s_goertzel (
             double x,
             int n,
             double * b,
             double * cx,
             double * sx )
```

Implementation of basic sequential Goertzel algorithm.

Parameters

x	Argument for C(x) and S(x)
n	Number of coefficients, b_0,...,b_n
b	Pointer to coefficients
cx	Pointer to computed C(x)
sx	Pointer to computed S(x)

Returns

void

4.2.2.2 trg_d_s_reinsch()

```
void trg_d_s_reinsch (
            double x,
            int n,
            double * b,
            double * cx,
            double * sx )
```

Implementation of basic sequential Reinschalgorithm.

Parameters

x	Argument for C(x) and S(x)
n	Number of coefficients, b_0,...,b_n
b	Pointer to coefficients
cx	Pointer to computed C(x)
sx	Pointer to computed S(x)

Returns

void

4.2.2.3 trg_d_v_goertzel()

```
void trg_d_v_goertzel (
            double x,
            int n,
            double * b,
            double * cx,
            double * sx )
```

Implementation of vectorized Goertzel algorithm introduced by Stpiczynski.

Parameters

x	Argument for C(x) and S(x)
n	Number of coefficients, b_0,...,b_n
b	Pointer to coefficients (should be allocated using _mm_malloc())
cx	Pointer to computed C(x)
sx	Pointer to computed S(x)

Returns

void

4.2.2.4 trg_d_v_reinsch()

```
void trg_d_v_reinsch (
            double x,
            int n,
            double * b,
            double * cx,
            double * sx )
```

Implementation of vectorized Reinsch algorithm introduced by Stpiczynski.

Parameters

x	Argument for C(x) and S(x)
n	Number of coefficients, b_0,...,b_n
b	Pointer to coefficients (should be allocated using _mm_malloc())
cx	Pointer to computed C(x)
sx	Pointer to computed S(x)

Returns

void

Index