API Collection

Discrete Fourier transforms

Transform vectors of temporal and spatial domain complex values to the frequency domain, and vice versa.

Topics

Objects that simplify discrete Fourier transforms

class **DiscreteFourierTransform**

An object that provides forward and inverse discrete Fourier transforms on single- or double-precision collections of interleaved or split-complex data.

enum **DFTTransformType**

Discrete Fourier transform types.

~~class~~ ~~DFT~~

A single- and double-precision discrete Fourier transform.

`Deprecated`

Interleaved discrete Fourier transform functions

📄 Performing Fourier transforms on interleaved-complex data

Optimize discrete Fourier transform (DFT) performance with the vDSP interleaved DFT routines.

func **vDSP_DFT_Interleaved_CreateSetup**(vDSP_DFT_Interleaved_Setup?, vDSP_Length, vDSP_DFT_Direction, vDSP_DFT_RealtoComplex) -> vDSP_DFT_Interleaved_Setup?

Returns a setup structure that contains precalculated data for forward and inverse, single-precision interleaved discrete Fourier transform (DFT) functions.

```
func vDSP_DFT_Interleaved_CreateSetupD(vDSP_DFT_Interleaved_SetupD?, v
DSP_Length, vDSP_DFT_Direction, vDSP_DFT_RealtoComplex) -> vDSP_DFT
_Interleaved_SetupD?
```

Returns a setup structure that contains precalculated data for forward and inverse, double-precision interleaved discrete Fourier transform (DFT) functions.

```
func vDSP_DFT_Interleaved_Execute(vDSP_DFT_Interleaved_Setup, Unsafe
Pointer<DSPComplex>, UnsafeMutablePointer<DSPComplex>)
```

Calculates the single-precision discrete Fourier transform (DFT) for a vector of interleaved complex values.

```
func vDSP_DFT_Interleaved_ExecuteD(vDSP_DFT_Interleaved_SetupD, Unsafe
Pointer<DSPDoubleComplex>, UnsafeMutablePointer<DSPDoubleComplex>)
```

Calculates the double-precision discrete Fourier transform (DFT) for a vector of interleaved complex values.

```
func vDSP_DFT_Interleaved_DestroySetup(vDSP_DFT_Interleaved_Setup?)
```

Releases a single-precision discrete Fourier transform (DFT) setup structure.

```
func vDSP_DFT_Interleaved_DestroySetupD(vDSP_DFT_Interleaved_SetupD?)
```

Releases a double-precision discrete Fourier transform (DFT) setup structure.

Real discrete Fourier transform setup

```
vDSP_DFT_zrop_CreateSetup
```

Returns a setup structure that contains precalculated data for forward and inverse, real, single-precision DFT functions.

```
vDSP_DFT_zrop_CreateSetupD
```

Returns a setup structure that contains precalculated data for forward and inverse, real, double-precision DFT functions.

Complex discrete Fourier transform setup

```
vDSP_DFT_zop_CreateSetup
```

Returns a setup structure that contains precalculated data for forward and inverse, complex, single-precision DFT functions.

`vDSP_DFT_zop_CreateSetupD`

Returns a setup structure that contains precalculated data for forward and inverse, complex, double-precision DFT functions.

Functions to perform discrete Fourier transforms

`vDSP_DFT_Execute`

Calculates the discrete single-precision Fourier transform for a vector.

`vDSP_DFT_ExecuteD`

Calculates the discrete double-precision Fourier transform for a vector.

Discrete Fourier transform cleanup

`vDSP_DFT_DestroySetup`

Releases a single-precision setup structure.

`vDSP_DFT_DestroySetupD`

Releases a double-precision setup structure.

Data types

`typealias vDSP_DFT_Interleaved_Setup`

An opaque type that contains setup information for an interleaved single-precision discrete Fourier transform (DFT).

`typealias vDSP_DFT_Interleaved_SetupD`

An opaque type that contains setup information for an interleaved double-precision discrete Fourier transform (DFT).

`typealias vDSP_DFT_Setup`

An opaque type that contains setup information for a single-precision discrete Fourier transform (DFT).

`typealias vDSP_DFT_SetupD`

An opaque type that contains setup information for a double-precision discrete Fourier transform (DFT).

Constants

```
enum vDSP_DFT_Direction
```
An enumeration that specifies whether to perform a forward or inverse DFT.

Enumerations

```
enum vDSP_DFT_RealtoComplex
```

See Also

Fourier and Cosine Transforms

▤ Understanding data packing for Fourier transforms

Format source data for the vDSP Fourier functions, and interpret the results.

▤ Finding the component frequencies in a composite sine wave

Use 1D fast Fourier transform to compute the frequency components of a signal.

▤ Performing Fourier transforms on interleaved-complex data

Optimize discrete Fourier transform (DFT) performance with the vDSP interleaved DFT routines.

▤ Reducing spectral leakage with windowing

Multiply signal data by window sequence values when performing transforms with noninteger period signals.

{} Signal extraction from noise

Use Accelerate's discrete cosine transform to remove noise from a signal.

▤ Performing Fourier Transforms on Multiple Signals

Use Accelerate's multiple-signal fast Fourier transform (FFT) functions to transform multiple signals with a single function call.

{} Halftone descreening with 2D fast Fourier transform

Reduce or remove periodic artifacts from images.

≔ Fast Fourier transforms

Transform vectors and matrices of temporal and spatial domain complex values to the frequency domain, and vice versa.

Discrete Cosine transforms

Transform vectors of temporal and spatial domain real values to the frequency domain, and vice versa.