API Collection

Multichannel biquadratic filters

Filter a multichannel signal with a cascade of biquadratic sections.

Overview

The vDSP library implements biquadratic filtering as a cascade of individual infinite impulse response (IIR) filters called *sections*. Each section has its own set of feedback and feedforward coefficients, and implements a direct-form 2 filter.

When the biquadratic filter function executes, the sections execute in sequence. Each section processes the entire input signal and passes its output to the next section for further processing.

> **Note**
>
> The vDSP biquadratic filters work in place. That is, the source and destination pointers may point to the same memory.

> **Note on performance and energy efficiency**
>
> Although you can use `vDSP_biquadm` to process a single channel of data, it's optimized for processing multiple channels of data independently. When processing only a single channel, the single-channel API `vDSP_biquad` may provide better performance and energy efficiency. When processing a single channel in isolation, it's best practice to use `vDSP_biquad` whenever possible.

Topics

Equalizing audio with biquadratic filters

{} Equalizing audio with discrete cosine transforms (DCTs)

Change the frequency response of an audio signal by manipulating frequency-domain data.

Creating a multichannel biquadratic filter setup

`vDSP_biquadm_CreateSetup`

Builds a data structure that contains precalculated data for use by a single-precision, multichannel cascaded biquadratic filter function.

`typealias vDSP_biquadm_Setup`

A data structure that contains precalculated data for use by a single-precision, multichannel cascaded biquadratic filter function.

`vDSP_biquadm_CreateSetupD`

Builds a data structure that contains precalculated data for use by a double-precision, multichannel cascaded biquadratic filter function.

`typealias vDSP_biquadm_SetupD`

A data structure that contains precalculated data for use by a double-precision, multichannel cascaded biquadratic filter function.

Copying the filter state of a multichannel biquadratic filter

`vDSP_biquadm_CopyState`

Copies the filter state from one single-precision multichannel biquadratic IIR filter object to another.

`vDSP_biquadm_CopyStateD`

Copies the filter state from one double-precision multichannel biquadratic IIR filter object to another.

Resetting the filter state of a multichannel biquadratic filter

`vDSP_biquadm_ResetState`

Resets the filter state of a single-precision multichannel biquadratic IIR filter object.

`vDSP_biquadm_ResetStateD`

Resets the filter state of a double-precision multichannel biquadratic IIR filter object.

Setting the filter state of a multichannel biquadratic filter

`vDSP_biquadm_SetActiveFilters`

Activates or deactivates individual sections in a single-precision, multichannel biquadratic filter.

`vDSP_biquadm_SetActiveFiltersD`

Activates or deactivates individual sections in a double-precision, multichannel biquadratic filter.

Setting the coefficients of a multichannel biquadratic filter

`vDSP_biquadm_SetCoefficientsSingle`

Sets the single-precision coefficients of the specified single-precision, multichannel biquadratic filter setup object.

`vDSP_biquadm_SetCoefficientsDouble`

Sets the double-precision coefficients of the specified single-precision, multichannel biquadratic filter setup object.

`vDSP_biquadm_SetCoefficientsSingleD`

Sets the single-precision coefficients of the specified double-precision, multichannel biquadratic filter setup object.

`vDSP_biquadm_SetCoefficientsDoubleD`

Sets the double-precision coefficients of the specified double-precision, multichannel biquadratic filter setup object.

Setting the target values of a multichannel biquadratic filter

`vDSP_biquadm_SetTargetsSingle`

Sets the single-precision coefficient target values of the specified single-precision, multichannel biquadratic filter setup object.

`vDSP_biquadm_SetTargetsDouble`

Sets the double-precision coefficient target values of the specified single-precision, multichannel biquadratic filter setup object.

`vDSP_biquadm_SetTargetsSingleD`

Sets the single-precision coefficient target values of the specified double-precision, multichannel biquadratic filter setup object.

`vDSP_biquadm_SetTargetsDoubleD`

Sets the double-precision coefficient target values of the specified double-precision, multichannel biquadratic filter setup object.

Applying a multichannel biquadratic filter

`vDSP_biquadm`

Applies a single-precision multichannel biquadratic IIR filter.

`vDSP_biquadmD`

Applies a double-precision multichannel biquadratic IIR filter.

Destroying a multichannel biquadratic filter setup

`vDSP_biquadm_DestroySetup`

Destroys a single-precision multichannel biquadratic filter setup object.

`vDSP_biquadm_DestroySetupD`

Destroys a double-precision multichannel biquadratic filter setup object.

See Also

Vector filtering

- Biquadratic IIR filters

  Apply biquadratic filters to single-channel and multichannel data.

- Single-channel biquadratic filters

  Filter a single-channel signal with a cascade of biquadratic sections.

- Finite impulse response filters

  Perform finite impulse response filtering with decimation and antialiasing on vectors of real or complex values.

- Recursive filters

Perform two-pole two-zero recursive filtering on a vector.