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""" Utility functions used throughout DeepInPy for vector processing. """

**Classes:**

N/A

**Methods:**

***topk***

"""Finds the top k values of a vector along a specified dimension.

Args:

inp (torch.Tensor): The tensor to retrieve the top k values from.

k (int): The number of values to retrieve.

dim (int): The dimension of the Tensor the values should be retrieved from.

Returns:

A Tensor of the same shape as the original containing only the top k values.

"""

***t2n***

"""Converts a 2-channel real Tensor into a numpy array containing complex values.

Args:

x (Tensor): The Tensor to be converted.

Returns:

A numpy array containing complex-valued information from x.

"""

***t2n2***

"""Converts a Tensor into a numpy array directly.

Args:

x (Tensor): The Tensor to convert.

Returns:

A numpy array initialized from x which has been detached from its computational graph.

"""

***itemize***

"""Converts a Tensor into a list of Python numbers.

Args:

x (Tensor): The tensor being itemized.

Returns:

Python list containing the itemized contents of the tensor.

"""

***fftmod***

"""Performs a modulated FFT on the input, that is multiplying every other line by exp(j\*pi) which is a shift of N/2, hence modulating the output by +/- pi.

Args:

out (array\_like): Input to the FFT.

Returns:

The modulated FFT of the input.

"""

***fftshift***

"""Shifts the zero-frequency component of the last two dimensions of the input to the center of the spectrum.

Args:

x (array\_like): The vector to be shifted.

axes (array\_like): The axes along which to apply the shift, default (-2, -1), None uses all axes.

Returns:

The shifted version of x.

"""

***ifftshift***

"""Removes the effects of shifting the zero-frequency component of the last two dimensions of the input to the center of the spectrum.

Args:

x (array\_like): The vector whose shift is to be removed.

axes (array\_like): The axes along which to apply the shift, default (-2, -1), None uses all axes.

Returns:

An unshifted version of x.

"""

***fft2c***

"""Performs a 2-dimensional centered FFT on the last two dimensions of the input.

Args:

x (array\_like): The values to be transformed.

Returns:

The 2-dimensional centered FFT of x.

"""

***ifft2c***

"""Performs an inverse 2-dimensional centered FFT on the last two dimensions of the input.

Args:

x (array\_like): The values to be transformed.

Returns:

The inverse 2-dimensional centered FFT of x.

"""

***fft2uc***

"""Performs a unitary-centered 2-dimensional FFT on the last two dimensions of the input.

Args:

x (array\_like): The values to be transformed.

Returns:

The unitary-centered 2-dimensional FFT of x.

"""

***ifft2uc***

"""Performs an inverse unitary-centered 2-dimensional FFT on the last two dimensions of the input.

Args:

x (array\_like): The values to be transformed.

Returns:

The inverse unitary-centered 2-dimensional FFT of x.

"""

***fft2***

"""Performs a 2-dimensional FFT on the last two dimensions of the input.

Args:

x (array\_like): The values to be transformed.

axes (array\_like): The axes along which to apply the shift, default (-2, -1), None uses all axes.

Returns:

The 2-dimensional FFT of x.

"""

***ifft2***

"""Performs an inverse 2-dimensional FFT on the last two dimensions of the input.

Args:

x (array\_like): The values to be transformed.

axes (array\_like): The axes along which to apply the shift, default (-2, -1), None uses all axes.

Returns:

The inverse 2-dimensional FFT of x.

"""