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Freestyle Functions (freestyle.functions)

This module contains functions operating on vertices (0D elements) and polylines (1D elements). The module is also intended to be a collection of examples for function definition in Python.

User-defined functions inherit one of the following base classes, depending on the object type (0D or 1D) to operate on and the return value type:

- freestyle.types.UnaryFunction0DDouble
- freestyle.types.UnaryFunction0DEdgeNature
- freestyle.types.UnaryFunction0DFloat
- freestyle.types.UnaryFunction0DId
- freestyle.types.UnaryFunction0DMaterial
- freestyle.types.UnaryFunction0DUnsigned
- freestyle.types.UnaryFunction0DVec2f
- freestyle.types.UnaryFunction0DVec3f
- freestyle.types.UnaryFunction0DVectorViewShape
- freestyle.types.UnaryFunction0DViewShape
- freestyle.types.UnaryFunction1DDouble
- freestyle.types.UnaryFunction1DEdgeNature
- freestyle.types.UnaryFunction1DFloat
- freestyle.types.UnaryFunction1DUnsigned
- freestyle.types.UnaryFunction1DVec2f
- freestyle.types.UnaryFunction1DVec3f
- freestyle.types.UnaryFunction1DVectorViewShape
- freestyle.types.UnaryFunction1DVoid

class freestyle.functions.**ChainingTimeStampF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DVoid > ChainingTimeStampF1D

__init__()

Builds a ChainingTimeStampF1D object.

__call__(inter)

Sets the chaining time stamp of the Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

class freestyle.functions.**Curvature2DAngleF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DDouble > Curvature2DAngleF0D

__init__()

Builds a Curvature2DAngleF0D object.

__call__(it)

Returns a real value giving the 2D curvature (as an angle) of the 1D element to which the freestyle.types.Interface0D pointe by the Interface0DIterator belongs. The 2D curvature is evaluated at the Interface0D.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

RETURNS:

The 2D curvature of the 1D element evaluated at the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**Curvature2DAngleF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DDouble` > `Curvature2DAngleF1D`

__init__(integration_type=IntegrationType.MEAN)

Builds a Curvature2DAngleF1D object.

PARAMETERS:

integration_type (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the 2D curvature as an angle for an Interface1D.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The 2D curvature as an angle.

RETURN TYPE:

float

class freestyle.functions.**CurveMaterialF0D**

A replacement of the built-in MaterialF0D for stroke creation. MaterialF0D does not work with Curves and Strokes. Line color priority is used to pick one of the two materials at material boundaries.

Notes: expects instances of CurvePoint to be iterated over

can return None if no fedge can be found

class freestyle.functions.**CurveNatureF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DEdgeNature` > `CurveNatureF0D`

__init__()

Builds a CurveNatureF0D object.

__call__(it)

Returns the `freestyle.types.Nature` of the 1D element the Interface0D pointed by the Interface0DIterator belongs to.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The nature of the 1D element to which the pointed Interface0D belongs.

RETURN TYPE:

`freestyle.types.Nature`

class freestyle.functions.**CurveNatureF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DEdgeNature` > `CurveNatureF1D`

__init__(integration_type=IntegrationType.MEAN)

__init__(integration_type=IntegrationType.MEAN)

Builds a CurveNatureF1D object.

PARAMETERS:

integration_type (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the nature of the Interface1D (silhouette, ridge, crease, and so on). Except if the Interface1D is a `freestyle.types.ViewEdge` , this result might be ambiguous. Indeed, the Interface1D might result from the gathering of several 1I elements, each one being of a different nature. An integration method, such as the MEAN, might give, in this case, irrelevant results.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The nature of the Interface1D.

RETURN TYPE:

`freestyle.types.Nature`

class freestyle.functions.**DensityF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DDouble` > `DensityF0D`

__init__(sigma=2.0)

Builds a DensityF0D object.

PARAMETERS:

sigma (*float*) – The gaussian sigma value indicating the X value for which the gaussian function is 0.5. It leads to the window size value (the larger, the smoother).

__call__(it)

Returns the density of the (result) image evaluated at the `freestyle.types.Interface0D` pointed by the Interface0DIterator. Th density is evaluated using a pixels square window around the evaluation point and integrating these values using a gaussian.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The density of the image evaluated at the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**DensityF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DDouble` > `DensityF1D`

__init__(sigma=2.0, integration_type=IntegrationType.MEAN, sampling=2.0)

Builds a DensityF1D object.

PARAMETERS:

- **sigma** (*float*) – The sigma used in DensityF0D and determining the window size used in each density query.
- **integration_type** (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.
- **sampling** (*float*) – The resolution used to sample the chain: the corresponding 0D function is evaluated at each sample point and the res is obtained by combining the resulting values into a single one, following the method specified by integration_type.

__call__(inter)

Returns the density evaluated for an Interface1D. The density is evaluated for a set of points along the Interface1D (using the `freestyle.functions.DensityF0D` functor) with a user-defined sampling and then integrated into a single value using a user-defined integration method.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The density evaluated for an Interface1D.

RETURN TYPE:

float

class freestyle.functions.**GetCompleteViewMapDensityF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DDouble` > `GetCompleteViewMapDensityF1D`

__init__(level, integration_type=IntegrationType.MEAN, sampling=2.0)

Builds a GetCompleteViewMapDensityF1D object.

PARAMETERS:

- **level** (*int*) – The level of the pyramid from which the pixel must be read.
- **integration_type** (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.
- **sampling** (*float*) – The resolution used to sample the chain: the corresponding 0D function is evaluated at each sample point and the res is obtained by combining the resulting values into a single one, following the method specified by integration_type.

__call__(inter)

Returns the density evaluated for an Interface1D in the complete viewmap image. The density is evaluated for a set of points along the Interface1D (using the `freestyle.functions.ReadCompleteViewMapPixelF0D` functor) and then integrated into a sing value using a user-defined integration method.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The density evaluated for the Interface1D in the complete viewmap image.

RETURN TYPE:

float

class freestyle.functions.**GetCurvilinearAbscissaF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DFloat` > `GetCurvilinearAbscissaF0D`

__init__()

Builds a GetCurvilinearAbscissaF0D object.

__call__(it)

Returns the curvilinear abscissa of the `freestyle.types.Interface0D` pointed by the Interface0DIterator in the context of its 1 element.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The curvilinear abscissa of the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**GetDirectionalViewMapDensityF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DDouble > GetDirectionalViewMapDensityF1D

__init__(orientation, level, integration_type=IntegrationType.MEAN, sampling=2.0)

Builds a GetDirectionalViewMapDensityF1D object.

PARAMETERS:

- **orientation** (*int*) – The number of the directional map we must work with.
- **level** (*int*) – The level of the pyramid from which the pixel must be read.
- **integration_type** (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.
- **sampling** (*float*) – The resolution used to sample the chain: the corresponding 0D function is evaluated at each sample point and the res is obtained by combining the resulting values into a single one, following the method specified by integration_type.

__call__(inter)

Returns the density evaluated for an Interface1D in of the steerable viewmaps image. The direction telling which Directional map to choose is explicitly specified by the user. The density is evaluated for a set of points along the Interface1D (using the freestyle.functions.ReadSteerableViewMapPixelF0D functor) and then integrated into a single value using a user-defined integration method.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

the density evaluated for an Interface1D in of the steerable viewmaps image.

RETURN TYPE:

float

class freestyle.functions.**GetOccludeeF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DViewShape > GetOccludeeF0D

__init__()

Builds a GetOccludeeF0D object.

__call__(it)

Returns the freestyle.types.ViewShape that the Interface0D pointed by the Interface0DIterator occludes.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The ViewShape occluded by the pointed Interface0D.

RETURN TYPE:

freestyle.types.ViewShape

class freestyle.functions.**GetOccludeeF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DVectorViewShape > GetOccludeeF1D

__init__()

Builds a GetOccludeeF1D object.

__call__(inter)

Returns a list of occluded shapes covered by this Interface1D.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

A list of occluded shapes covered by the Interface1D.

RETURN TYPE:

list[`freestyle.types.ViewShape`]

class freestyle.functions.**GetOccludersF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DVectorViewShape` > `GetOccludersF0D`

__init__()

Builds a GetOccludersF0D object.

__call__(it)

Returns a list of `freestyle.types.ViewShape` occluding the `freestyle.types.Interface0D` pointed by the Interface0DIterator.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

A list of ViewShape objects occluding the pointed Interface0D.

RETURN TYPE:

list[`freestyle.types.ViewShape`]

class freestyle.functions.**GetOccludersF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DVectorViewShape` > `GetOccludersF1D`

__init__()

Builds a GetOccludersF1D object.

__call__(inter)

Returns a list of occluding shapes that cover this Interface1D.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

A list of occluding shapes that cover the Interface1D.

RETURN TYPE:

list[`freestyle.types.ViewShape`]

class freestyle.functions.**GetParameterF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DFloat` > `GetParameterF0D`

__init__()

Builds a GetParameterF0D object.

__call__(it)

Returns the parameter of the freestyle.types.Interface0D pointed by the Interface0DIterator in the context of its 1D elemen

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The parameter of an Interface0D.

RETURN TYPE:

float

class freestyle.functions.**GetProjectedXF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DDouble > GetProjectedXF0D

__init__()

Builds a GetProjectedXF0D object.

__call__(it)

Returns the X 3D projected coordinate of the freestyle.types.Interface0D pointed by the Interface0DIterator.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The X 3D projected coordinate of the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**GetProjectedXF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DDouble > GetProjectedXF1D

__init__(integration_type=IntegrationType.MEAN)

Builds a GetProjectedXF1D object.

PARAMETERS:

integration_type (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the projected X 3D coordinate of an Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

The projected X 3D coordinate of an Interface1D.

RETURN TYPE:

float

class freestyle.functions.**GetProjectedYF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DDouble > GetProjectedYF0D

__init__()

__init__()

Builds a GetProjectedYF0D object.

__call__(it)

Returns the Y 3D projected coordinate of the `freestyle.types.Interface0D` pointed by the Interface0DIterator.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The Y 3D projected coordinate of the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**GetProjectedYF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DDouble` > `GetProjectedYF1D`

__init__(integration_type=IntegrationType.MEAN)

Builds a GetProjectedYF1D object.

PARAMETERS:

integration_type (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the projected Y 3D coordinate of an Interface1D.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The projected Y 3D coordinate of an Interface1D.

RETURN TYPE:

float

class freestyle.functions.**GetProjectedZF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DDouble` > `GetProjectedZF0D`

__init__()

Builds a GetProjectedZF0D object.

__call__(it)

Returns the Z 3D projected coordinate of the `freestyle.types.Interface0D` pointed by the Interface0DIterator.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The Z 3D projected coordinate of the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**GetProjectedZF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DDouble` > `GetProjectedZF1D`

GetProjectedZF1D

__init__(integration_type=IntegrationType.MEAN)

Builds a GetProjectedZF1D object.

PARAMETERS:

integration_type (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the projected Z 3D coordinate of an Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

The projected Z 3D coordinate of an Interface1D.

RETURN TYPE:

float

class freestyle.functions.**GetShapeF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DViewShape > GetShapeF0D

__init__()

Builds a GetShapeF0D object.

__call__(it)

Returns the freestyle.types.ViewShape containing the Interface0D pointed by the Interface0DIterator.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The ViewShape containing the pointed Interface0D.

RETURN TYPE:

freestyle.types.ViewShape

class freestyle.functions.**GetShapeF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DVectorViewShape > GetShapeF1D

__init__()

Builds a GetShapeF1D object.

__call__(inter)

Returns a list of shapes covered by this Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

A list of shapes covered by the Interface1D.

RETURN TYPE:

list[freestyle.types.ViewShape]

class freestyle.functions.**GetSteerableViewMapDensityF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DDouble > GetSteerableViewMapDensityF1D

__init__(level, integration_type=IntegrationType.MEAN, sampling=2.0)

Builds a GetSteerableViewMapDensityF1D object.

PARAMETERS:

- **level** (*int*) – The level of the pyramid from which the pixel must be read.
- **integration_type** (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.
- **sampling** (*float*) – The resolution used to sample the chain: the corresponding 0D function is evaluated at each sample point and the res is obtained by combining the resulting values into a single one, following the method specified by integration_type.

__call__(inter)

Returns the density of the ViewMap for a given Interface1D. The density of each freestyle.types.FEdge is evaluated in the prop steerable freestyle.types.ViewMap depending on its orientation.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

The density of the ViewMap for a given Interface1D.

RETURN TYPE:

float

class freestyle.functions.**GetViewMapGradientNormF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DFloat > GetViewMapGradientNormF0D

__init__(level)

Builds a GetViewMapGradientNormF0D object.

PARAMETERS:

level (*int*) – The level of the pyramid from which the pixel must be read.

__call__(it)

Returns the norm of the gradient of the global viewmap density image.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The norm of the gradient of the global viewmap density image.

RETURN TYPE:

float

class freestyle.functions.**GetViewMapGradientNormF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DDouble > GetViewMapGradientNormF1D

__init__(level, integration_type=IntegrationType.MEAN, sampling=2.0)

Builds a GetViewMapGradientNormF1D object.

PARAMETERS:

- **level** (*int*) – The level of the pyramid from which the pixel must be read.
- **integration_type** (freestyle.types.IntegrationType) – The integration method used to compute a single value from

set of values.

- **sampling** (*float*) – The resolution used to sample the chain: the corresponding 0D function is evaluated at each sample point and the res is obtained by combining the resulting values into a single one, following the method specified by integration_type.

__call__(inter)

Returns the density of the ViewMap for a given Interface1D. The density of each `freestyle.types.FEdge` is evaluated in the prop steerable `freestyle.types.ViewMap` depending on its orientation.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The density of the ViewMap for a given Interface1D.

RETURN TYPE:

float

class freestyle.functions.**GetXF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DDouble` > `GetXF0D`

__init__()

Builds a GetXF0D object.

__call__(it)

Returns the X 3D coordinate of the `freestyle.types.Interface0D` pointed by the Interface0DIterator.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The X 3D coordinate of the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**GetXF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DDouble` > `GetXF1D`

__init__(integration_type=IntegrationType.MEAN)

Builds a GetXF1D object.

PARAMETERS:

integration_type (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the X 3D coordinate of an Interface1D.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The X 3D coordinate of the Interface1D.

RETURN TYPE:

float

class freestyle.functions.**GetYF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DDouble` > `GetYF0D`

__init__()

Builds a GetYF0D object.

__call__(it)

Returns the Y 3D coordinate of the `freestyle.types.Interface0D` pointed by the Interface0DIterator.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The Y 3D coordinate of the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**GetYF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DDouble` > `GetYF1D`

__init__(integration_type=IntegrationType.MEAN)

Builds a GetYF1D object.

PARAMETERS:

integration_type (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the Y 3D coordinate of an Interface1D.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The Y 3D coordinate of the Interface1D.

RETURN TYPE:

float

class freestyle.functions.**GetZF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DDouble` > `GetZF0D`

__init__()

Builds a GetZF0D object.

__call__(it)

Returns the Z 3D coordinate of the `freestyle.types.Interface0D` pointed by the Interface0DIterator.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The Z 3D coordinate of the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**GetZF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DDouble > GetZF1D

__init__(integration_type=IntegrationType.MEAN)

Builds a GetZF1D object.

PARAMETERS:

integration_type (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the Z 3D coordinate of an Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

The Z 3D coordinate of the Interface1D.

RETURN TYPE:

float

class freestyle.functions.**IncrementChainingTimeStampF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DVoid > IncrementChainingTimeStampF1D

__init__()

Builds an IncrementChainingTimeStampF1D object.

__call__(inter)

Increments the chaining time stamp of the Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

class freestyle.functions.**LocalAverageDepthF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DDouble > LocalAverageDepthF0D

__init__(mask_size=5.0)

Builds a LocalAverageDepthF0D object.

PARAMETERS:

mask_size (*float*) – The size of the mask.

__call__(it)

Returns the average depth around the freestyle.types.Interface0D pointed by the Interface0DIterator. The result is obtained by querying the depth buffer on a window around that point.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The average depth around the pointed Interface0D.

RETURN TYPE:

float

class freestyle.functions.**LocalAverageDepthF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DDouble` > `LocalAverageDepthF1D`

__init__(sigma, integration_type=IntegrationType.MEAN)

Builds a LocalAverageDepthF1D object.

PARAMETERS:

- **sigma** (*float*) – The sigma used in DensityF0D and determining the window size used in each density query.
- **integration_type** (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the average depth evaluated for an Interface1D. The average depth is evaluated for a set of points along the Interface1D (using the `freestyle.functions.LocalAverageDepthF0D` functor) with a user-defined sampling and then integrated into a single valu using a user-defined integration method.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The average depth evaluated for the Interface1D.

RETURN TYPE:

float

class freestyle.functions.**MaterialF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DMaterial` > `MaterialF0D`

__init__()

Builds a MaterialF0D object.

__call__(it)

Returns the material of the object evaluated at the `freestyle.types.Interface0D` pointed by the Interface0DIterator. This evaluation can be ambiguous (in the case of a `freestyle.types.TVertex` for example. This functor tries to remove this ambiguity using the context offered by the 1D element to which the Interface0DIterator belongs to and by arbitrary choosing the material of the face that lies on its left when following the 1D element if there are two different materials on each side of the point. However, there still can be problematic cases, and the user willing to deal with this cases in a specific way should implement its own getMaterial functor.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The material of the object evaluated at the pointed Interface0D.

RETURN TYPE:

`freestyle.types.Material`

class freestyle.functions.**Normal2DF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DVec2f` > `Normal2DF0D`

__init__()

Builds a Normal2DF0D object.

__call__(it)

Returns a two-dimensional vector giving the normalized 2D normal to the 1D element to which the freestyle.types.Interface0D pointed by the Interface0DIterator belongs. The normal is evaluated at the pointed Interface0D

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The 2D normal of the 1D element evaluated at the pointed Interface0D.

RETURN TYPE:

mathutils.Vector

class freestyle.functions.**Normal2DF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DVec2f > Normal2DF1D

__init__(integration_type=IntegrationType.MEAN)

Builds a Normal2DF1D object.

PARAMETERS:

integration_type (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the 2D normal for the Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

The 2D normal for the Interface1D.

RETURN TYPE:

mathutils.Vector

class freestyle.functions.**Orientation2DF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DVec2f > Orientation2DF1D

__init__(integration_type=IntegrationType.MEAN)

Builds an Orientation2DF1D object.

PARAMETERS:

integration_type (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the 2D orientation of the Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

The 2D orientation of the Interface1D.

RETURN TYPE:

mathutils.Vector

class freestyle.functions.**Orientation3DF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DVec3f > Orientation3DF1D

__init__(integration_type=IntegrationType.MEAN)

Builds an Orientation3DF1D object.

PARAMETERS:

integration_type (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the 3D orientation of the Interface1D.

PARAMETERS:

inter (freestyle.types.Interface1D) – An Interface1D object.

RETURNS:

The 3D orientation of the Interface1D.

RETURN TYPE:

mathutils.Vector

class freestyle.functions.**QuantitativeInvisibilityF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DUnsigned > QuantitativeInvisibilityF0D

__init__()

Builds a QuantitativeInvisibilityF0D object.

__call__(it)

Returns the quantitative invisibility of the freestyle.types.Interface0D pointed by the Interface0DIterator. This evaluation can be ambiguous (in the case of a freestyle.types.TVertex for example). This functor tries to remove this ambiguity using the context offered by the 1D element to which the Interface0D belongs to. However, there still can be problematic cases, and the user willing to deal with this cases in a specific way should implement its own getQIF0D functor.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The quantitative invisibility of the pointed Interface0D.

RETURN TYPE:

int

class freestyle.functions.**QuantitativeInvisibilityF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DUnsigned > QuantitativeInvisibilityF1D

__init__(integration_type=IntegrationType.MEAN)

Builds a QuantitativeInvisibilityF1D object.

PARAMETERS:

integration_type (freestyle.types.IntegrationType) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns the Quantitative Invisibility of an Interface1D element. If the Interface1D is a freestyle.types.ViewEdge , then there is no ambiguity concerning the result. But, if the Interface1D results of a chaining (chain, stroke), then it might be made of several 1D elements of

different Quantitative Invisibilities.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The Quantitative Invisibility of the Interface1D.

RETURN TYPE:

int

class freestyle.functions.**ReadCompleteViewMapPixelF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DFloat` > `ReadCompleteViewMapPixelF0D`

__init__(level)

Builds a ReadCompleteViewMapPixelF0D object.

PARAMETERS:

level (*int*) – The level of the pyramid from which the pixel must be read.

__call__(it)

Reads a pixel in one of the level of the complete viewmap.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

A pixel in one of the level of the complete viewmap.

RETURN TYPE:

float

class freestyle.functions.**ReadMapPixelF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DFloat` > `ReadMapPixelF0D`

__init__(map_name, level)

Builds a ReadMapPixelF0D object.

PARAMETERS:

- **map_name** (*str*) – The name of the map to be read.
- **level** (*int*) – The level of the pyramid from which the pixel must be read.

__call__(it)

Reads a pixel in a map.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

A pixel in a map.

RETURN TYPE:

float

class freestyle.functions.**ReadSteerableViewMapPixelF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DFloat` > `ReadSteerableViewMapPixelF0D`

__init__(orientation, level)

Builds a ReadSteerableViewMapPixelF0D object.

PARAMETERS:

- **orientation** (*int*) – The integer belonging to [0, 4] indicating the orientation (E, NE, N, NW) we are interested in.
- **level** (*int*) – The level of the pyramid from which the pixel must be read.

__call__(it)

Reads a pixel in one of the level of one of the steerable viewmaps.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

A pixel in one of the level of one of the steerable viewmaps.

RETURN TYPE:

float

class freestyle.functions.**ShapeIdF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DId` > `ShapeIdF0`

__init__()

Builds a ShapeIdF0D object.

__call__(it)

Returns the `freestyle.types.Id` of the Shape the `freestyle.types.Interface0D` pointed by the Interface0DIterator belongs to. This evaluation can be ambiguous (in the case of a `freestyle.types.TVertex` for example). This functor tries to remo this ambiguity using the context offered by the 1D element to which the Interface0DIterator belongs to. However, there still can be problemati cases, and the user willing to deal with this cases in a specific way should implement its own getShapeIdF0D functor.

PARAMETERS:

it (`freestyle.types.Interface0DIterator`) – An Interface0DIterator object.

RETURNS:

The Id of the Shape the pointed Interface0D belongs to.

RETURN TYPE:

`freestyle.types.Id`

class freestyle.functions.**TimeStampF1D**

Class hierarchy: `freestyle.types.UnaryFunction1D` > `freestyle.types.UnaryFunction1DVoid` > `TimeStampF1D`

__init__()

Builds a TimeStampF1D object.

__call__(inter)

Returns the time stamp of the Interface1D.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

class freestyle.functions.**VertexOrientation2DF0D**

Class hierarchy: `freestyle.types.UnaryFunction0D` > `freestyle.types.UnaryFunction0DVec2f` > `VertexOrientation2DF0D`

__init__()

__init__()

Builds a VertexOrientation2DF0D object.

__call__(it)

Returns a two-dimensional vector giving the 2D oriented tangent to the 1D element to which the freestyle.types.Interface0D pointed by the Interface0DIterator belongs. The 2D oriented tangent is evaluated at the pointed Interface0D.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The 2D oriented tangent to the 1D element evaluated at the pointed Interface0D.

RETURN TYPE:

mathutils.Vector

class freestyle.functions.**VertexOrientation3DF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DVec3f > VertexOrientation3DF0D

__init__()

Builds a VertexOrientation3DF0D object.

__call__(it)

Returns a three-dimensional vector giving the 3D oriented tangent to the 1D element to which the freestyle.types.Interface0 pointed by the Interface0DIterator belongs. The 3D oriented tangent is evaluated at the pointed Interface0D.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The 3D oriented tangent to the 1D element evaluated at the pointed Interface0D.

RETURN TYPE:

mathutils.Vector

class freestyle.functions.**ZDiscontinuityF0D**

Class hierarchy: freestyle.types.UnaryFunction0D > freestyle.types.UnaryFunction0DDouble > ZDiscontinuityF0D

__init__()

Builds a ZDiscontinuityF0D object.

__call__(it)

Returns a real value giving the distance between the freestyle.types.Interface0D pointed by the Interface0DIterator and the shape that lies behind (occludee). This distance is evaluated in the camera space and normalized between 0 and 1. Therefore, if no object is occluded by the shape to which the Interface0D belongs to, 1 is returned.

PARAMETERS:

it (freestyle.types.Interface0DIterator) – An Interface0DIterator object.

RETURNS:

The normalized distance between the pointed Interface0D and the occludee.

RETURN TYPE:

float

class freestyle.functions.**ZDiscontinuityF1D**

Class hierarchy: freestyle.types.UnaryFunction1D > freestyle.types.UnaryFunction1DDouble > ZDiscontinuityF1D

ZDiscontinuityF1D

__init__(integration_type=IntegrationType.MEAN)

Builds a ZDiscontinuityF1D object.

PARAMETERS:

integration_type (`freestyle.types.IntegrationType`) – The integration method used to compute a single value from set of values.

__call__(inter)

Returns a real value giving the distance between an Interface1D and the shape that lies behind (occludee). This distance is evaluated in the camera space and normalized between 0 and 1. Therefore, if no object is occluded by the shape to which the Interface1D belongs to, 1 is returned.

PARAMETERS:

inter (`freestyle.types.Interface1D`) – An Interface1D object.

RETURNS:

The normalized distance between the Interface1D and the occludee.

RETURN TYPE:

float

class freestyle.functions.**pyCurvilinearLengthF0D**

class freestyle.functions.**pyDensityAnisotropyF0D**

Estimates the anisotropy of density.

class freestyle.functions.**pyDensityAnisotropyF1D**

class freestyle.functions.**pyGetInverseProjectedZF1D**

class freestyle.functions.**pyGetSquareInverseProjectedZF1D**

class freestyle.functions.**pyInverseCurvature2DAngleF0D**

class freestyle.functions.**pyViewMapGradientNormF0D**

class freestyle.functions.**pyViewMapGradientNormF1D**

class freestyle.functions.**pyViewMapGradientVectorF0D**

Returns the gradient vector for a pixel.

__init__(self, level)

Builds a pyViewMapGradientVectorF0D object.

PARAMETERS:

level (*int*) – the level at which to compute the gradient

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