

**UF\_EVAL\_ask\_arc** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Returns the arc data of the evaluator of a circular curve or edge.

**Environment**

Internal and External

**See Also**

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_is\\_arc](#)

**History**

Originally released in V15.0

**Required License(s)**

gateway

```
int UF_EVAL_ask_arc
(
    UF_EVAL_p_t evaluator,
    UF_EVAL_arc_p_t arc
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure for the curve. This must be an arc, or an error will be returned.
UF_EVAL_arc_p_t	<b>arc</b>	Output	arc data

**UF\_EVAL\_ask\_ellipse** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Returns the ellipse data of the evaluator of an elliptical curve or edge.

**Environment**

Internal and External

**See Also**

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_is\\_ellipse](#)

**History**

Originally released in V15.0

**Required License(s)**

gateway

```
int UF_EVAL_ask_ellipse
(
```

```
UF_EVAL_p_t evaluator,  
UF_EVAL_ellipse_p_t ellipse  
)
```

UF_EVAL_p_t	evaluator	Input	evaluator structure for the curve. This must be an ellipse, or an error will be returned.
UF_EVAL_ellipse_p_t	ellipse	Output	ellipse data

**UF\_EVAL\_ask\_hyperbola** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Returns the hyperbola data of the evaluator of a hyperbolic curve.  
There are no hyperbolic edges in NX.

**Environment**

Internal and External

**See Also**

- [UF\\_EVAL\\_initialize](#)
- [UF\\_EVAL\\_is\\_hyperbola](#)

**History**

Originally released in V15.0

**Required License(s)**

gateway

```
int UF_EVAL_ask_hyperbola  
(  
    UF_EVAL_p_t evaluator,  
    UF_EVAL_hyperbola_p_t hyperbola  
)
```

UF_EVAL_p_t	evaluator	Input	evaluator structure for the curve. This must be a hyperbola, or an error will be returned.
UF_EVAL_hyperbola_p_t	hyperbola	Output	hyperbola data

**UF\_EVAL\_ask\_limits** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Returns the curve limits of the evaluator of a curve or edge.

**Environment**

Internal and External

See Also

[UF\\_EVAL\\_initialize](#)

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_ask_limits
(
    UF_EVAL_p_t evaluator,
    double limits [ 2 ]
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure
double	<b>limits [ 2 ]</b>	Output	limits

UF\_EVAL\_ask\_line [\(view source\)](#)

Defined in: `uf_eval.h`

Overview

Returns the line data of the evaluator of a linear curve or edge

Environment

Internal and External

See Also

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_is\\_line](#)

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_ask_line
(
    UF_EVAL_p_t evaluator,
    UF_EVAL_line_p_t line
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure of the curve. This must be a line, or an error will be returned.
<a href="#">UF_EVAL_line_p_t</a>	<b>line</b>	Output	The data for this line.

**UF\_EVAL\_ask\_parabola** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Returns the parabola data from the evaluator of a parabolic curve.  
There are no parabolic edges in NX.

**Environment**

Internal and External

**See Also**

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_is\\_parabola](#)

**History**

Originally released in V15.0

**Required License(s)**

gateway

```
int UF_EVAL_ask_parabola
(
    UF_EVAL_p_t evaluator,
    UF_EVAL_parabola_p_t parabola
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure for the curve. This must be a parabola, or an error will be returned.
<a href="#">UF_EVAL_parabola_p_t</a>	<b>parabola</b>	Output	parabola data

**UF\_EVAL\_ask\_spline** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Returns the spline data of the evaluator of a spline curve or edge

**Environment**

Internal and External

**See Also**

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_is\\_spline](#)  
[UF\\_EVAL\\_ask\\_spline\\_control\\_pts](#)  
[UF\\_EVAL\\_ask\\_spline\\_knots](#)

**History**

Originally released in V15.0

**Required License(s)**

gateway

```
int UF_EVAL_ask_spline
(
    UF_EVAL_p_t evaluator,
    UF_EVAL_spline_p_t spline
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure for the curve. This must be a spline, or an error will be returned.
UF_EVAL_spline_p_t	<b>spline</b>	Output	spline data

UF\_EVAL\_ask\_spline\_control\_pts [\(view source\)](#)

Defined in: `uf_eval.h`

Overview

Returns the spline control points of the evaluator of a spline curve or edge.

Environment

Internal and External

See Also

- [UF\\_EVAL\\_initialize](#)
- [UF\\_EVAL\\_is\\_spline](#)
- [UF\\_EVAL\\_ask\\_spline](#)
- [UF\\_EVAL\\_ask\\_spline\\_knots](#)

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_ask_spline_control_pts
(
    UF_EVAL_p_t evaluator,
    int * n_points,
    double ** points
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure for the curve. This must be a spline, or an error will be returned.
int *	<b>n_points</b>	Output	count of control points
double **	<b>points</b>	Output to UF_*free*	For each control point, four values are returned, ( wx, wy, xz, w ). This array must be freed by calling UF_free.

UF\_EVAL\_ask\_spline\_knots [\(view source\)](#)

Defined in: `uf_eval.h`

Overview

Returns the spline knots of the evaluator of a spline curve or edge.

Environment

Internal and External

See Also

- [UF\\_EVAL\\_initialize](#)
- [UF\\_EVAL\\_is\\_spline](#)
- [UF\\_EVAL\\_ask\\_spline](#)
- [UF\\_EVAL\\_ask\\_spline\\_control\\_pts](#)

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_ask_spline_knots
(
    UF_EVAL_p_t evaluator,
    int * n_knots,
    double ** knots
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure for the curve. This must be a spline, or an error will be returned.
int *	<b>n_knots</b>	Output	count of knots in sequence
double **	<b>knots</b>	Output to UF_*free*	knot sequence points, the parameter values for each knot point in the spline. This array must be freed by calling UF_free. These parameters are not normalized.

UF\_EVAL\_copy [\(view source\)](#)

Defined in: `uf_eval.h`

Overview

Copies the evaluator of an curve or edge.  
Return copy of evaluator structure.

Environment

Internal and External

See Also

- [UF\\_EVAL\\_initialize](#)
- [UF\\_EVAL\\_free](#)

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_copy
(
    UF_EVAL_p_t evaluator,
    UF_EVAL_p_t * evaluator_copy
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	Evaluator structure to copy
UF_EVAL_p_t *	<b>evaluator_copy</b>	Output to UF_*free*	Copy of the evaluator structure. This must be freed by calling UF_EVAL_free.

UF\_EVAL\_evaluate [\(view source\)](#)

Defined in: `uf_eval.h`

Overview

Evaluates a point or the derivatives of an evaluator of a curve or edge

Environment

Internal and External

See Also

- [UF\\_EVAL\\_initialize](#)
- [UF\\_EVAL\\_ask\\_limits](#)

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_evaluate
(
    UF_EVAL_p_t evaluator,
    int n_derivatives,
    double parm,
    double point [ 3 ],
    double derivatives [ ]
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	Evaluator structure for the curve.
int	<b>n_derivatives</b>	Input	number of derivative vectors

double	<b>parm</b>	Input	Parameter to evaluate the curve at. This parameter is not normalized. The parameter limits for a given curve can be found by calling UF_EVAL_ask_limits.
double	<b>point [ 3 ]</b>	Output	point on curve
double	<b>derivatives [ ]</b>	Output	Derivative vectors on the curve. The caller is responsible for providing space to return 3n_derivatives real numbers.

**UF\_EVAL\_evaluate\_closest\_point** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Returns the closest parameter point on the curve or edge given a specified reference point. Note that parameters returned are not normalized.

**Environment**

Internal and External

**See Also**

- [UF\\_EVAL\\_initialize](#)
- [UF\\_EVAL\\_ask\\_limits](#)
- [UF\\_MODL\\_ask\\_point\\_along\\_curve\\_2](#) -- Handles curves with sharp corners better

**History**

Originally released in V15.0

**Required License(s)**

gateway

```
int UF_EVAL_evaluate_closest_point
(
    UF_EVAL_p_t evaluator,
    const double reference_point [ 3 ] ,
    double * parm,
    double closest_point [ 3 ]
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	The evaluator structure of the curve.
const double	<b>reference_point [ 3 ]</b>	Input	The reference point
double *	<b>parm</b>	Output	The parameter of the closest point on the curve to the reference point. This parameter is not normalized.
double	<b>closest_point [ 3 ]</b>	Output	The closest point on the curve to the reference point.



**UF\_EVAL\_evaluate\_unit\_vectors** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Evaluates a point or the unit vectors of an evaluator of a curve or edge.

**Environment**

Internal and External

**See Also**

- [UF\\_EVAL\\_initialize](#)
- [UF\\_EVAL\\_ask\\_limits](#)

**History**

Originally released in V15.0

**Required License(s)**

gateway

```
int UF_EVAL_evaluate_unit_vectors
(
    UF_EVAL_p_t evaluator,
    double parm,
    double point [ 3 ],
    double tangent [ 3 ],
    double normal [ 3 ],
    double binormal [ 3 ]
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	The evaluator structure for the curve.
double	<b>parm</b>	Input	The parameter to evaluate at. Note that the parameter is not normalized. You can get the parameters for the given evaluator structure by calling UF_EVAL_ask_limits.
double	<b>point [ 3 ]</b>	Output	The point on the curve
double	<b>tangent [ 3 ]</b>	Output	The tangent to the curve at that point.
double	<b>normal [ 3 ]</b>	Output	The normal to the curve at that point.
double	<b>binormal [ 3 ]</b>	Output	The binormal to the curve at that point.

**UF\_EVAL\_free** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Frees the evaluator of a curve or edge.

**Environment**

Internal and External

## See Also

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_copy](#)

## History

Originally released in V15.0

## Required License(s)

gateway

```
int UF_EVAL_free
(
    UF_EVAL_p_t evaluator
)
```

UF\_EVAL\_p\_t    **evaluator**    Input    evaluator structure to be freed

## UF\_EVAL\_initialize [\(view source\)](#)

Defined in: `uf_eval.h`

### Overview

Initialize an evaluator structure.

Returns a pointer to the evaluator of a curve or edge. The evaluator can be used to find points, derivatives and vectors of a curve or edge at a given parameter value. No longer use

`UF_CURVE_ask_curve_struct ( )`,  
`UF_CURVE_ask_curve_struct_data ( )` and  
`UF_CURVE_free_curve_struct ( )`.

Note that this API will approximate procedurally created edges (such as edges created by intersecting two surfaces) with a spline to the current Modeling distance tolerance.

### Environment

Internal and External

## See Also

[UF\\_EVAL\\_initialize\\_2](#)  
[UF\\_EVAL\\_free](#)

## History

Originally released in V15.0

## Required License(s)

gateway

```
int UF_EVAL_initialize
(
    tag_t tag,
    UF_EVAL_p_t * evaluator
)
```

<a href="#">tag_t</a>	<b>tag</b>	Input	Object identifier of a curve or edge
UF_EVAL_p_t *	<b>evaluator</b>	Output to UF_*free*	Evaluator structure for this curve. It must be freed by calling UF_EVAL_free.

**UF\_EVAL\_initialize\_2** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Initialize an evaluator structure.

Returns a pointer to the evaluator of a curve or edge. The evaluator can be used to find points, derivatives and vectors of a curve or edge at a given parameter value. No longer use `UF_CURVE_ask_curve_struct ( )`, `UF_CURVE_ask_curve_struct_data ( )` and `UF_CURVE_free_curve_struct ( )`.

This API will not approximate procedurally created edges.

**Environment**

Internal and External

**See Also**

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_free](#)

**History**

Originally released in NX7.0

**Required License(s)**

gateway

```
int UF_EVAL_initialize_2
(
    tag_t tag,
    UF_EVAL_p_t * evaluator
)
```

<a href="#">tag_t</a>	<b>tag</b>	Input	Object identifier of a curve or edge
UF_EVAL_p_t *	<b>evaluator</b>	Output to UF_*free*	Evaluator structure for this curve. It must be freed by calling UF_EVAL_free.

**UF\_EVAL\_is\_arc** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Determines if the given evaluator is from a circular curve or edge.

Environment

Internal and External

See Also

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_ask\\_arc](#)

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_is_arc
(
    UF_EVAL_p_t evaluator,
    logical * is_arc
)
```

UF_EVAL_p_t	evaluator	Input	evaluator structure of the curve
logical *	is_arc	Output	TRUE if this is an arc, else FALSE



UF\_EVAL\_is\_ellipse [\(view source\)](#)

Defined in: `uf_eval.h`

Overview

Determines if the evaluator is from an elliptical curve or edge

Environment

Internal and External

See Also

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_ask\\_ellipse](#)

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_is_ellipse
(
    UF_EVAL_p_t evaluator,
    logical * is_ellipse
)
```

UF_EVAL_p_t	evaluator	Input	evaluator structure of the curve.
-------------	-----------	-------	-----------------------------------

<code>logical *</code>	<code>is_ellipse</code>	Output	TRUE if this is an ellipse, else FALSE
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**UF\_EVAL\_is\_equal** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Determines if two evaluators are equal. This implies that the curve(s) and/or edge(s) are equal.

**Environment**

Internal and External

**See Also**

[UF\\_EVAL\\_initialize](#)

**History**

Originally released in V15.0

**Required License(s)**

gateway

```
int UF_EVAL_is_equal
(
    UF_EVAL_p_t evaluator1,
    UF_EVAL_p_t evaluator2,
    logical * is_equal
)
```

UF_EVAL_p_t	<b>evaluator1</b>	Input	evaluator structure for the first curve
UF_EVAL_p_t	<b>evaluator2</b>	Input	evaluator structure for the second curve
<code>logical *</code>	<b>is_equal</b>	Output	TRUE if the curves are equal, else FALSE

**UF\_EVAL\_is\_hyperbola** [\(view source\)](#)

Defined in: `uf_eval.h`

**Overview**

Determines if the evaluator is from a hyperbolic curve. There are no hyperbolic edges in NX.

**Environment**

Internal and External

**See Also**

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_ask\\_hyperbola](#)

**History**

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_is_hyperbola
(
    UF_EVAL_p_t evaluator,
    logical * is_hyperbola
)
```

UF_EVAL_p_t	evaluator	Input	evaluator structure of the curve.
logical *	is_hyperbola	Output	TRUE if the curve is a hyperbola, else FALSE

UF\_EVAL\_is\_line (view source)

Defined in: uf\_eval.h

Overview

Determines if the evaluator is from a linear curve or edge.

Environment

Internal and External

See Also

- UF\_EVAL\_initialize
- UF\_EVAL\_ask\_line

History

Originally released in V15.0

Required License(s)

gateway

```
int UF_EVAL_is_line
(
    UF_EVAL_p_t evaluator,
    logical * is_line
)
```

UF_EVAL_p_t	evaluator	Input	The evaluator structure of the curve.
logical *	is_line	Output	TRUE if this is a line, else FALSE

UF\_EVAL\_is\_parabola (view source)

Defined in: uf\_eval.h

## Overview

Determines if the evaluator is from a parabolic curve. There are no parabolic edges in NX.

## Environment

Internal and External

## See Also

[UF\\_EVAL\\_initialize](#)

[UF\\_EVAL\\_ask\\_parabola](#)

## History

Originally released in V15.0

## Required License(s)

gateway

```
int UF_EVAL_is_parabola
(
    UF_EVAL_p_t evaluator,
    logical * is_parabola
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure of the curve
<a href="#">logical</a> *	<b>is_parabola</b>	Output	TRUE if the curve is a parabola, else FALSE

---

## UF\_EVAL\_is\_periodic [\(view source\)](#)

Defined in: `uf_eval.h`

## Overview

Query if the input curve is periodic.  
Determines if the evaluator is from a periodic curve or edge.

## Environment

Internal and External

## See Also

[UF\\_EVAL\\_initialize](#)

## History

Originally released in V15.0

## Required License(s)

gateway

```
int UF_EVAL_is_periodic
(
    UF_EVAL_p_t evaluator,
    logical * is_periodic
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure for the curve.
<a href="#">logical *</a>	<b>is_periodic</b>	Output	TRUE if the curve is periodic, else FALSE

---

## UF\_EVAL\_is\_spline [\(view source\)](#)

Defined in: `uf_eval.h`

### Overview

Determines if the evaluator is from a spline curve or edge.

### Environment

Internal and External

### See Also

[UF\\_EVAL\\_initialize](#)  
[UF\\_EVAL\\_ask\\_spline](#)  
[UF\\_EVAL\\_ask\\_spline\\_control\\_pts](#)  
[UF\\_EVAL\\_ask\\_spline\\_knots](#)

### History

Originally released in V15.0

### Required License(s)

gateway

```
int UF_EVAL_is_spline
(
    UF_EVAL_p_t evaluator,
    logical * is_spline
)
```

UF_EVAL_p_t	<b>evaluator</b>	Input	evaluator structure of the curve
<a href="#">logical *</a>	<b>is_spline</b>	Output	TRUE if the curve is a spline, else FALSE

---

## UF\_EVALSF\_ask\_face\_uv\_minmax [\(view source\)](#)

Defined in: `uf_evalsf.h`

### Overview

Computes the u,v parameter space min, max of a face

### Environment

Internal and External

### Required License(s)

gateway



```
int UF_EVALSF_ask_face_uv_minmax
(
    UF_EVALSF_pc_t evaluator,
    double uv_min_max [ 4 ]
)
```

UF_EVALSF_pc_t	evaluator	Input	Address of evaluator structure
double	uv_min_max [ 4 ]	Output	[0] - umin [1] - umax [2] - vmin [3] - vmax

**UF\_EVALSF\_ask\_minimum\_face\_dist** [\(view source\)](#)

Defined in: `uf_evalsf.h`

**Overview**

Returns the minimum distance parameter and point on the surface of a face given a reference point.

The surface point is on the portion which is bounded by the edges of the face.

To find the closest point on the extended surface (not within bounding edges) use `UF_EVALSF_find_closest_point`

**Environment**

Internal and External

**Required License(s)**

gateway

```
int UF_EVALSF_ask_minimum_face_dist
(
    UF_EVALSF_pc_t evaluator,
    const double point [ 3 ] ,
    UF_EVALSF_pos3_p_t srf_pos3
)
```

UF_EVALSF_pc_t	evaluator	Input	Address of evaluator structure
const double	point [ 3 ]	Input	Given point in absolute space
<a href="#">UF_EVALSF_pos3_p_t</a>	srf_pos3	Output	Address of point position on surface

**UF\_EVALSF\_evaluate** [\(view source\)](#)

Defined in: `uf_evalsf.h`

**Overview**

Evaluates a point and the derivatives of a face at the given parameter value.

## Environment

Internal and External

## See Also

UF\_MODL\_evaluate\_face and UF\_MODL\_ask\_face\_props

Note that UF\_EVALSF\_evaluate may not properly handle parameter values returned by UF\_EVALSF\_find\_closest\_point or similar functions for surface types Blend or Trimmed B-surface. The above functions should be called instead.

## Required License(s)

gateway

```
int UF_EVALSF_evaluate
(
    UF_EVALSF_pc_t evaluator,
    int deriv_flag,
    const double uv_pair [ 2 ],
    UF_MODL_SRF_VALUE_p_t surf_eval
)
```

UF_EVALSF_pc_t	evaluator	Input	Address of evaluator structure
int	deriv_flag	Input	order of the derivative to be computed: UF_MODL_EVAL - position UF_MODL_EVAL_DERIV1 - position and 1. partial UF_MODL_EVAL_DERIV2 - position, 1. and 2. partials UF_MODL_EVAL_DERIV3 - position, 1., 2. and 3. partials UF_MODL_EVAL_UNIT_NORMAL - position, 1. partials and unitized normal. UF_MODL_EVAL_NORMAL - position, 1. partials and the ununitized normal. UF_MODL_EVAL_ALL - position, normals and all the partials up to the third order.
const double	uv_pair [ 2 ]	Input	uv-parameter pair at which derivatives are to be computed. The parameter limits for a given face can be found by calling UF_EVALSF_ask_face_uv_minmax.
UF_MODL_SRF_VALUE_p_t	surf_eval	Output	Address of evaluation result structure containing position and derivatives: srf_pos[3] - position srf_du[3] - d/du srf_dv[3] - d/dv srf_unormal[3] - unit normal srf_d2u[3] - d2/du2 srf_dudv[3] - d2/dudv srf_d2v[3] - d2/dv2 srf_d3u[3] - d3/du3 srf_d2udv[3] - d3/du2dv srf_dud2v[3] - d3/dud2v srf_d3v[3] - d3/dv3 srf_normal[3] - d/du X d/dv

UF\_EVALSF\_evaluate\_array (view source)

Defined in: uf\_evalsf.h

Overview

Evaluates an array of points and derivatives of a face for a given array of parameter values.

Environment

Internal and External

See Also

UF\_MODL\_evaluate\_face and UF\_MODL\_ask\_face\_props  
Note that UF\_EVALSF\_evaluate\_array may not properly handle parameter values returned by UF\_EVALSF\_find\_closest\_point or similar functions for surface types Blend or Trimmed B-surface. The above functions should be called instead.

Required License(s)

gateway

```
int UF_EVALSF_evaluate_array
(
    UF_EVALSF_pc_t evaluator,
    int deriv_flag,
    int num_points,
    const double uv_pairs [ ],
    UF_MODL_SRF_VALUE_t surf_evals [ ]
)
```

UF_EVALSF_pc_t	evaluator	Input	Address of evaluator structure
int	deriv_flag	Input	order of the derivative to be computed: UF_MODL_EVAL - position UF_MODL_EVAL_DERIV1 - position and 1. partial UF_MODL_EVAL_DERIV2 - position, 1. and 2. partials UF_MODL_EVAL_DERIV3 - position, 1., 2. and 3. partials UF_MODL_EVAL_UNIT_NORMAL - position, 1. partials and unitized normal. UF_MODL_EVAL_NORMAL - position, 1. partials and the ununitized normal. UF_MODL_EVAL_ALL - position, normals and all the partials up to the third order.
int	num_points	Input	number of points to evaluate
const double	uv_pairs [ ]	Input	num_points uv-parameter pairs The parameter limits for a given face can be found by calling UF_EVALSF_ask_face_uv_minmax.
UF_MODL_SRF_VALUE_t	surf_evals [ ]	Output	Address of array of evaluation results The caller must provide space of size = sizeof(UF_MODL_SRF_VALUE_t) num_points Each structure element contains: srf_pos[3] - position srf_du[3] - d/du

```
srf_dv[3] - d/dv
srf_unormal[3] - unit normal
srf_d2u[3] - d2/du2
srf_dudv[3] - d2/dudv
srf_d2v[3] - d2/dv2
srf_d3u[3] - d3/du3
srf_d2udv[3] - d3/du2dv
srf_dud2v[3] - d3/dud2v
srf_d3v[3] - d3/dv3
srf_normal[3] - d/du X d/dv
```

**UF\_EVALSF\_find\_closest\_point** [\(view source\)](#)

Defined in: `uf_evalsf.h`

**Overview**

Finds on the surface the closest point and uv-parameter pair to a given point.

Note that the returned point will be on the underlying surface but may not be on the portion which is bounded by the edges of the face.

Note that in some cases, there is a potential risk that the returned point might be adjusted incorrectly where the underlying surface has an extended UV range. Please use `UF_EVALSF_find_closest_point_2` instead.

To find the closest point within bounding edges, use `UF_EVALSF_ask_minimum_face_dist`

**Environment**

Internal and External

**Required License(s)**

gateway

```
int UF_EVALSF_find_closest_point
(
    UF_EVALSF_pc_t evaluator,
    const double point [ 3 ],
    UF_EVALSF_pos3_p_t srf_pos3
)
```

UF_EVALSF_pc_t	<b>evaluator</b>	Input	Address of evaluator structure
const double	<b>point [ 3 ]</b>	Input	Given point in absolute space
UF_EVALSF_pos3_p_t	<b>srf_pos3</b>	Output	Address of point position on surface

**UF\_EVALSF\_find\_closest\_point\_2** [\(view source\)](#)

Defined in: `uf_evalsf.h`

**Overview**

Finds on the surface the closest point and uv-parameter pair to a given point.

Note that the returned point will be on the underlying surface but may not be on the portion which is bounded by the edges of the face.

To find the closest point within bounding edges, use  
UF\_EVALSF\_ask\_minimum\_face\_dist

Environment

Internal and External

Required License(s)

gateway

```
int UF_EVALSF_find_closest_point_2
(
    UF_EVALSF_pc_t evaluator,
    const double point [ 3 ] ,
    UF_EVALSF_pos3_p_t srf_pos3
)
```

UF_EVALSF_pc_t	<b>evaluator</b>	Input	Address of evaluator structure
const double	<b>point [ 3 ]</b>	Input	Given point in absolute space
UF_EVALSF_pos3_p_t	<b>srf_pos3</b>	Output	Address of point position on surface

UF\_EVALSF\_free (view source)

Defined in: uf\_evalsf.h

Overview

Frees the evaluator of a face

Environment

Internal and External

Required License(s)

gateway

```
int UF_EVALSF_free
(
    UF_EVALSF_p_t * evaluator
)
```

UF_EVALSF_p_t *	<b>evaluator</b>	Output	address of evaluator pointer
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UF\_EVALSF\_initialize (view source)

Defined in: `uf_evalsf.h`

Overview

Initializes a face evaluator structure

Environment

Internal and External

Required License(s)

gateway

```
int UF_EVALSF_initialize
(
    tag_t face_tag,
    UF_EVALSF_p_t * evaluator
)
```

<code>tag_t</code>	<code>face_tag</code>	Input	Object identifier of a face
<code>UF_EVALSF_p_t *</code>	<code>evaluator</code>	Output to <code>UF_*free*</code>	Evaluator structure for this face. It must be freed by calling <code>UF_EVALFS_free</code> .

UF\_EVALSF\_initialize\_2 [\(view source\)](#)

Defined in: `uf_evalsf.h`

Overview

Initializes a face evaluator structure with correct parameter mapping

Environment

Internal and External

Required License(s)

gateway

```
int UF_EVALSF_initialize_2
(
    tag_t face_tag,
    UF_EVALSF_p_t * evaluator
)
```

<code>tag_t</code>	<code>face_tag</code>	Input	Object identifier of a face
<code>UF_EVALSF_p_t *</code>	<code>evaluator</code>	Output to <code>UF_*free*</code>	Evaluator structure for this face. It must be freed by calling <code>UF_EVALFS_free</code> .