# IceMan - Creation

Strictly speaking, these are not "operators" in the conventional sense, because they create new *IceImage* instances. They are accessed from the scripting language by sending the class name *IceImage* the messages below. This would be analogous to using a static member function in C++.

All these operations create a *leaf* node: a node with no inputs forming the leaves of an image processing expression.

The examples provided below are the IceMan expressions as they would be used in the "it" console, using Python. You can also use help() to get more details on a specific operator. For example:

```
py> help(ice.PolyFill)
Help on built-in function PolyFill in module ice._ice:

PolyFill(...)
    Create an image with a filled polygon. Edges are anti-aliased using a super-sampling grid specified
in samples. (5, 5) is usually sufficient.

    i = ice.PolyFill(colorCard, pointList, samples)

py>
```

Some of the operators below take a "box" (image rectangle) list as an input parameter. The format of the list should be [xmin, xmax, ymin, ymax].

## **Card**(*type, [sample1, ... ,sampleN]*)

Create a *card*, or an image of constant color. Cards are evaluated upon creation, unlike other images.

### Parameters

#### t*ype*

Pixel data type. Type is one of: ice.constants.FRACTIONAL (8 bit unsigned), ice.constants.FIXED_POINT, ice.constants.FLOAT, ice.constants.DOUBLE

*[sample1,...]*
Component value of each channel (list)

### Example

```
grey = ice.Card(ice.constants.FLOAT, [0.5])

red = ice.Card(ice.constants.FLOAT, [1,0,0])

redalpha = ice.Card(ice.constants.FLOAT [1,0,0,1])
```

## **FilledImage**(*type, box, color*)

Create an image of a specified type and size that's filled with a specified color. This is like a card, except that it has finite dimensions, and is not allocated until used.

### Parameters
*type*
Pixel data type. Type is one of: ice.constants.FRACTIONAL (8 bit unsigned), ice.constants.FIXED_POINT, ice.constants.FLOAT, ice.constants.DOUBLE

*box*
Image rectangle (list)

*color*
Pixel data as a float array (list)

### Example

```
box = [0, 300, 0, 200]
color = [1.0, 0.5, 0.3, 1.0]
p = ice.FilledImage(ice.constants.FLOAT, box, color)
```

## GaussianNoise(*type, ply, box, muAndSigma, range, seed*)

Create an image filled with Gaussian noise in the specified range. Mean and standard deviation are specified as a pair of floating point values.

### Parameters

*type*
Pixel data type (int)

*ply*
Number of channels (int)

*box*
Image rectangle (list)

*muAndSigma*
Mean and standard deviation (list)

*range*
Range of values in image (list)

*seed*
Large Number for random number generator seed (int)

### Example

```
box = [0, 300, 0, 200]
musig = [0.5,0.25]
range = [0, 1.0]
p = ice.GaussianNoise(ice.constants.FRACTIONAL, 3, box, musig, range, 321234)
```

## **PolyFill**(*color, pointList, samples*)

Create an image with a filled polygon. Edges are anti-aliased using a super-sampling grid specifed in samples. [5, 5] is usually sufficient.

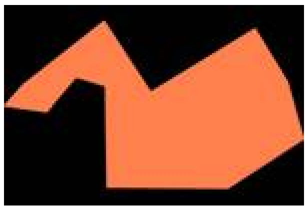
### Parameters

*color*
Card specifying fill color (ice.Card)

*pointList*
Polygon vertex list (list of tuples)

*samples*
Super-sampling grid for anti-aliasing (list)

### Example



```
color = ice.Card(ice.constants.FLOAT, [1.0, 0.5, 0.3])
vertices = [(228,343), (387, 218), (478, 357), (682, 233), (746, 338), (778, 450), (629, 547), (391, 545),
(388, 348), (322, 331), (275, 398), (189, 386)]
samples  = [5, 5]
p = ice.PolyFill(color, vertices, samples)
```

## **UniformNoise**(*type, ply, box, range, seed*)

This is a function to create a general color ramp. The angle is specified in degrees from the vertical. The center of the ramp is where the pixel value is exactly half-way between minimum and maximum values. The width is specified in pixels along the direction of variation. The range of values in the ramp is restricted to clampVal. The parameter easeInOut contains the ease-in point, below which the ramp smoothly reduces to the minimum value, and the ease-out point, above which the ramp smoothly "decelerates" to the maximum value. Ease-in/out points are expressed as fractions of the total ramp width.

In the example shown below, the angle of the ramp is 32.3, its center is at pixel coordinates [150.6, 100.1], its width is 363.4 pixels, its values are clamped between 0 and 0.85, and the ease-in and ease-out points are 36.34 pixels from either end of the ramp.

### Parameters

*type*
Pixel data type (int)

*ply*
Number of channels (int)

*box*
Image rectangle (list)

*angle*
Angle of ramp in degrees (float)

*center*

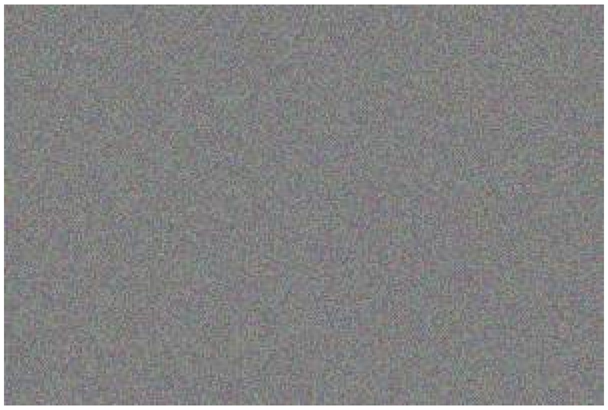
Center of ramp (float)

*width*
Width of ramp (float)

*clampVal*
Minimum and maximum values (float)

*easeInOut*
Ease-in and ease-out points (float)

### Example



```
size = [0, 300, 0, 200]
center = [156.2, 100.1]
minAndMax = [0, 0.85]
ease = [0.1, 0.1]
p = ice.Ramp(ice.constants.FLOAT, 3, size, 32.3, center, 363.4, minAndMax, ease)
```

## **RBFInterp**(*dataBox, pointList, valueTable, rFrac, freezeEdges*)

Given the values of a function f(x, y) at arbitrary points on the 2D pixel planes, compute values for all points on the pixel grid by radial basis function interpolation.

### Parameters

*dataBox*
Image rectangle (List)

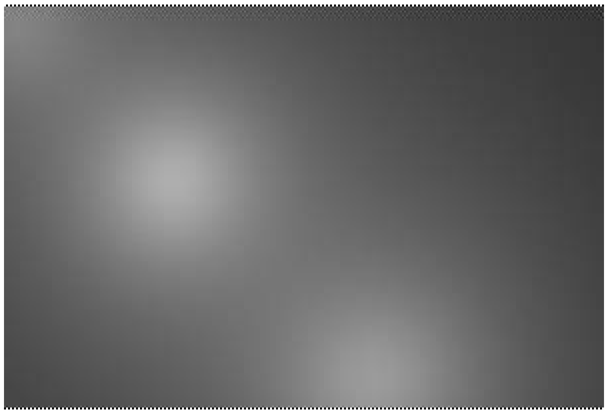
*pointList*
List of pixel coordinates (may be non-integral)

*valueTable*
Tabulated values of function at all pixel coordinates in *pointList*.

*rFrac*
A measure of the "sphere of influence" around a tabulated point. Useful values are in the 0.1 - 1 range: use smaller values for "tighter" roll-off.

*freezeEdges*
If true, edges are constrained to be zero valued.

### Example



```
size = [0, 300, 0, 200]
centers = [(10, 10), (50,50), (200,100)]
valuesAtCenters = [0.4, 0.6, 0.8]
sphereOfInfluence := .5
freezeEdges := 0
p = ice.RBFInterp(size, centers, valuesAtCenters, sphereOfInfluence, freezeEdges)
```

## **Sparkle**(*sparkleType, imageSize, center, type, slitAngle*)

Sparkle and glow kernels for selective convolution. This operation produces 3-channel kernels for sparkle and glow effects. It is typically used in conjunction with ConvolveSelective and ConvolveTrig.

### Parameters

*sparkleType*

ice.constants.SPARKLE_FRAUNHOFERSLITS or ice.constant.SPARKLE_GAUSSIAN, for sparkle and glow respectively. (int)

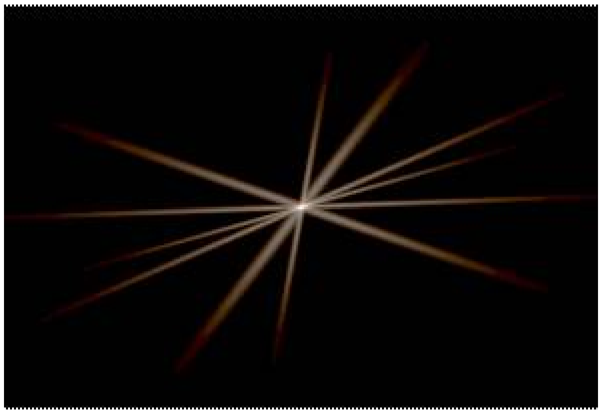
*imageSize*
Size of image (not rectangle: origin assumed to be zero). (List)

*center*
Center of sparkle. (list)

*type*
Pixel data type for image. (int)

*slitAngle*:
Angle of slit for diffraction. (float)

### Example



```
sizePoint = (300, 200)
center = (150,100)
slitAngle = 23
kind = ice.constants.SPARKLE_FRAUNHOFERSLITS
p = ice.Sparkle(kind, sizePoint, center, ice.constants.FRACTIONAL, slitAngle)
```