
Subject: Re: Median filter the hard way

Posted by [Dick Jackson](#) on Fri, 17 Oct 2003 21:34:30 GMT

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Hi Peter,

"Peter Payzant" <pce@accesswave.ca.nospam> wrote in message
news:WvGjb.92982\$PD3.4887868@nnrp1.uunet.ca...

> Hello, all-

>

> This is my first posting to the group.

Welcome aboard!

> He is applying a median filter to a 2-dimensional image.

> [but...]

> If there less than 7 good values in the 3 x 3 array, he discards

> the original pixel.

["loopy" :-) code snipped]

> Obviously, the nested loops are the source of the problem. Is there
any

> other way to accomplish this, in a more IDL-esque way?

As Mike mentions, the Median filter is part of it, but your "7 or
better" requirement makes it a bit more interesting.

Here's an array, a:

```
IDL> a=Float(Byte(RandomU(seed,7,7)*10))
```

```
IDL> a[2:4,2:4]=!values.F_nan
```

```
IDL> print,a,Format='(7F4.1)'
```

```
8.0 1.0 7.0 2.0 2.0 5.0 4.0
```

```
5.0 7.0 8.0 8.0 3.0 3.0 4.0
```

```
3.0 6.0 NaN NaN NaN 9.0 0.0
```

```
5.0 0.0 NaN NaN NaN 4.0 9.0
```

```
6.0 5.0 NaN NaN NaN 0.0 0.0
```

```
9.0 5.0 3.0 4.0 5.0 3.0 4.0
```

```
7.0 5.0 9.0 7.0 4.0 5.0 3.0
```

Median will give a result with even one actual number in the 3x3
neighborhood:

```
IDL> print,Median(a,3),Format='(7F4.1)'
```

```
8.0 1.0 7.0 2.0 2.0 5.0 4.0
```

```
5.0 7.0 7.0 7.0 3.0 4.0 4.0
```

```
3.0 5.0 7.0 8.0 4.0 4.0 0.0
```

```
5.0 5.0 5.0 NaN 4.0 4.0 9.0
6.0 5.0 4.0 4.0 4.0 4.0 0.0
9.0 6.0 5.0 5.0 4.0 4.0 4.0
7.0 5.0 9.0 7.0 4.0 5.0 3.0
```

Let's use the Finite function to figure which other ones to knock out to NaN:

```
IDL> print,Finite(a)
 1  1  1  1  1  1  1
 1  1  1  1  1  1  1
 1  1  0  0  0  1  1
 1  1  0  0  0  1  1
 1  1  0  0  0  1  1
 1  1  1  1  1  1  1
 1  1  1  1  1  1  1
```

The Convolve function can be used to count up neighborhoods. If you need better counting around the edge, you could pad the array before calling Convolve.

```
IDL> print,Convolve(Finite(a),Replicate(1B,3,3))
 0  0  0  0  0  0  0
 0  8  7  6  7  8  0
 0  7  5  3  5  7  0
 0  6  3  0  3  6  0
 0  7  5  3  5  7  0
 0  8  7  6  7  8  0
 0  0  0  0  0  0  0
```

OK, here goes:

```
IDL> m3=Median(a,3)
IDL> nGood = Convolve(Finite(a), Replicate(1B,3,3))
IDL> m3[Where(nGood LT 7)] = !Values.F_NaN
IDL> print,m3,Format='(7F4.1)'
NaN NaN NaN NaN NaN NaN NaN
NaN 7.0 7.0 NaN 3.0 4.0 NaN
NaN 5.0 NaN NaN NaN 4.0 NaN
NaN NaN NaN NaN NaN NaN NaN
NaN 5.0 NaN NaN NaN 4.0 NaN
NaN 6.0 5.0 NaN 4.0 4.0 NaN
NaN NaN NaN NaN NaN NaN NaN
```

Hope this helps!

Cheers,

--

-Dick

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