
Subject: Re: Zooming in place

Posted by [David Fanning](#) on Mon, 31 Oct 2005 17:15:29 GMT

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Pravish writes:

- > Zooming in place is one feature that does not seem to be popular with
- > IDL users. It is really strange that we are satisfied with the zoomed
- > image being in another window. That does not allow us to work with the
- > zoomed image. We can just view at the zoom image. I would like to zoom
- > on an image, in place and not in a separate window, and then work on
- > this image and if need be, zoom back. But, I am using a draw widget to
- > work with the image. That might seem to make things more complex.
- >
- > I have seen David's Zimage program and I think I could play around with
- > it and with some modifications, I will be able to use it.
- >
- > Any thoughts on this one?

Zooming in place is one of those things that sound like a good idea until you start to implement it. Then you find it burdened with one constraint or another that make it more difficult to implement than you initially thought it was going to be.

For example, if you allow the user to select the zoomed area, then you have problems of selection aspect ratio verses window aspect ratio. If you don't allow selection, then you have to determine how to allow the user to indicate selection, how much to zoom, etc.

The biggest challenge, though, is going from a device coordinate system to the "data" coordinate system of the image in the zoomed window. It is not trivial to figure out where exactly you are in the image when you are in a display window.

Once you have figured all this out once or twice, it is not something you really want to do again. So I would advise writing an image object that can do it all for you. Your image will need the ability to set up both a "normal" and "zoomed" coordinate system. You will need, probably, both the original image and a "display" image. (You might be able to create this on the fly.) You will need a method that can convert a point in window space to an image coordinate (the image "data" space) and visa versa, which means you will need an image that knows where it is in the display window.

You can build all this yourself (it will take less than a week, probably), or (if you have some money) you can talk to me about my Catalyst Library. The tools to do all this (in fact the image object

itself) are already in place. :-)

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Subject: Re: Zooming in place

Posted by [pravesh.subramanian](#) on Mon, 31 Oct 2005 17:37:48 GMT

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Thanks for the reply , David.

So going back to basics, a zoomed image is a scaling of the image, right? The best part about IDL is that it is array-oriented. I fix a default zoom factor, say 2. If the user clicks on some region in the draw widget, I might want to consider a radius of say 200 pixels around that point and scale all points in that region. It is easy till here. But, as you mentioned, conversion from zoomed coord system to the original system etc will cause more hurdles. The code will become more dense than I have now :(

I also see what you mean by the biggest challenge. I have to map device coords to the image .It seems somewhat intimidating!!

Best,
Pravesh

Subject: Re: Zooming in place

Posted by [David Fanning](#) on Mon, 31 Oct 2005 18:09:21 GMT

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Pravish writes:

> I also see what you mean by the biggest challenge. I have to map
> device coords to the image .It seems somewhat intimidating!!

Well, it doesn't have to be intimidating. All you need is the appropriate image coordinate system, which you could get in the most trivial case by drawing a set of axes around the image. A task that is made trivial, by the way, by most of the substitute TV commands available on the Internet. Once the data

coordinate system is established, conversion is quick and easy with CONVERT_COORD.

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Subject: Re: Zooming in place

Posted by [JD Smith](#) on Mon, 31 Oct 2005 22:05:30 GMT

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On Mon, 31 Oct 2005 10:15:29 -0700, David Fanning wrote:

> Pravish writes:

>

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>> IDL users. It is really strange that we are satisfied with the zoomed
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Just my \$0.02 on the "best" algorithm for in-place zooming. My viewer (which might be released one of these days) lets you select a zoom region with a rubber-band, or just click to double the zoom. The final selected region is zoomed up in integer multiples to maximally fill the display window, and the rest of the window defaults to some neutral background color. Single right clicks zoom you out one step, and double right-clicks zoom you out "all the way". Works fairly well, in practice.

JD

Subject: Re: Zooming in place
Posted by [Paul Van Delst\[1\]](#) on Mon, 31 Oct 2005 22:38:29 GMT
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JD Smith wrote:

>
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> (which might be released one of these days) lets you select a zoom region
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> window, and the rest of the window defaults to some neutral background
> color. Single right clicks zoom you out one step, and double right-clicks
> zoom you out "all the way". Works fairly well, in practice.

I like that approach (the either rubber-band or simple click-to-double-zoom).

One GUI who's functionality I have always wanted in IDL for both regular old x-y plots and images is that of map zooms like you see at yahoo or msn. You can click and zoom (with a little indicator on the side telling you your "zoom level") or you can turn off the zoom once you've achieved your required level and the click just recenters the display (or you have buttons at the N-S-E-W edges, and corners). One thing I always find when looking at data in IDL is that once I've zoomed (via rubber-band) to the level I want, I would like to traverse my plot. The only way I can do that now is to unzoom (right button click) and then zoom in again on a different part of my plot. It works, but unfortunately I no longer have the luxury of time to further develop my simple tool (I thought the yearly maintenance fee would be a good substitute but, alas, that scenario hasn't eventuated), and, jeez, this is the 21st century for pete's sake. :o) When I look over the shoulder of matlab users they're zooming and moving and bee-bopping all over the place! I think I'm

developing data-language envy :o(actually, :o)

paulv

--

Paul van Delst
CIMSS @ NOAA/NCEP/EMC

Subject: Re: Zooming in place
Posted by [Rick Towler](#) on Tue, 01 Nov 2005 00:11:10 GMT
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Paul Van Delst wrote:

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> old x-y plots and images is that of map zooms like you see at yahoo or
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> developing data-language envy :o(actually, :o)

Can you say "iTools"?

:)

-Rick

Subject: Re: Zooming in place
Posted by [David Fanning](#) on Tue, 01 Nov 2005 02:21:42 GMT
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Rick Towler writes:

> Can you say "iTools"?

Uh, well, I was just showing an iPlot to my class. Alas, the "zoom tool" makes the plot larger and smaller, but doesn't zoom into the data at all. Several disappointed users here. :-(

Cheers,

David

--

David Fanning, Ph.D.

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Subject: Re: Zooming in place

Posted by [Paul Van Delst\[1\]](#) on Tue, 01 Nov 2005 14:18:37 GMT

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Rick Towler wrote:

>

>

> Paul Van Delst wrote:

>

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>> moving and bee-bopping all over the place! I think I'm developing
>> data-language envy :o(actually, :o)

>

>

> Can you say "iTools"?

I refrained from it in my original post, but, yes I can: @*\$^@%\$#%&!

:o)

I've found the iTools stuff to be some of the most counter-intuitive GUIs I have ever used for displaying data. And it's just too slow. We get PC upgrades about every 3 or so years - I've got about 1 year to go and just using iPlot to zoom a 10^6 point $y=x^2$ plot is agonizingly slow compared to my simple, brain-dead wplot routine. I don't think it's reasonable for me to have to get a new PC just so some new features work fast enough when I know similar functionality is already available (from v5 onwards). And, frankly, given the heritage of iTools, I'm not surprised. Can anyone say Insight? Or Live_Tools?

I was going to continue my rant (blood pressure rising...) about all the effort on the OO stuff at the expense of just about everything else, but my iPlot just finished displaying (sans axes I might add....oh, there they are). So, I'm going to zoom in, go get a coffee while that cogitation is occurring, and then print the plot to a PostScript file.... hang on, there's no PS option. Bummer.

paulv

--

Paul van Delst
CIMSS @ NOAA/NCEP/EMC

Subject: Re: Zooming in place
Posted by [AJ](#) on Tue, 01 Nov 2005 16:20:04 GMT
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But the nice nifty "Data Range" manipulator (left from the Zoom manipulator) does exactly that, combining a rubberband zooming with nice + and - for the individual axis, or even for both axis (+ and - signs) !

"David Fanning" <david@dfanning.com> wrote in message
news:MPG.1dd07f24cb46979c989686@news.frii.com...

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> David

> --

> David Fanning, Ph.D.

> Fanning Software Consulting, Inc.

> Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Subject: Re: Zooming in place
Posted by [David Fanning](#) on Tue, 01 Nov 2005 16:50:08 GMT
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AJ writes:

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Oh, right. But I quickly get lost! How in the world
do I get back to where I started? :-(

Cheers,

David

--

David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Subject: Re: Zooming in place
Posted by [Rick Towler](#) on Tue, 01 Nov 2005 19:50:12 GMT
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Paul Van Delst wrote:

> Rick Towler wrote:

>> Paul Van Delst wrote:

>>

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```

>>
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> cogitation is occurring, and then print the plot to a PostScript
> file.... hang on, there's no PS option. Bummer.

```

I have to admit I was trolling a bit.

I knew I would at least get a small rise out of David. :) (He really didn't bite though. I think he is still high from his T-shirt experience.) Whether you love 'em or hate 'em, the iTools are RSI's response to gui based plot editors like MATLAB's figure window and let's be honest, something like this is sorely needed in IDL. Task 10 computer literate, but not so familiar with IDL or MATLAB, people with generating 10 figures forcing them to create the first 2 in IDL and MATLAB respectively and I bet that without iTools all 10 will do the last 8 in MATLAB.

And I agree Paul that iTool performance is abysmal (FTR, I'm running 6.1 and I know performance enhancements have been made in 6.2) but I think your jab at the OO/OG system is a bit unfair. IDL needed a new graphics subsystem and I couldn't imagine developing an application today without OG. I think what has been overlooked are the "value added" routines for object graphics. Classes and functions that sit somewhere in between the OG primitives and iTools that allow the more casual user to exploit OG in a manner similar to the DG system. For example, an IDLgrPlot subclass that actually provides axes (imagine that). Or an IDLgrView subclass that automagically displays its contents. Or XOBJVIEW on

steroids. And your dream zoom tool would be easy to implement in OG. Why it doesn't ship with IDL is beyond me.

But back to iTools. I, maybe foolishly, still think that the performance and UI issues can be worked out. But maybe they can't be and iTools will go the way of Live_Tools and many person hours of development will be wasted and IDL will fall back into its niche awaiting the next attempt to claw its way out to a broader audience.

-Rick

Subject: Re: Zooming in place

Posted by [JD Smith](#) on Tue, 01 Nov 2005 21:00:49 GMT

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On Mon, 31 Oct 2005 17:38:29 -0500, Paul Van Delst wrote:

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> When I look over the shoulder of matlab users they're zooming and moving
> and bee-bopping all over the place! I think I'm developing data-language
> envy :o(actually, :o)

Actually my tool takes care of that as well. When you are zoomed in, you can middle-click drag to pan right around inside the zoomed image. Very useful, and better in my opinion than tiny little versions of the image to pan the view rect inside. This is just for images, mind you, not plots.

JD

Subject: Re: Zooming in place
Posted by [AJ](#) on Wed, 02 Nov 2005 08:13:40 GMT
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Of course there is the Undo/Redo system but you are probably looking for something like the Window->Reset Dataspace Ranges. Would that be OK?

"David Fanning" <david@dfanning.com> wrote in message
news:MPG.1dd14aaec223e106989688@news.frii.com...

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> David

> --

> David Fanning, Ph.D.

> Fanning Software Consulting, Inc.

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Subject: Re: Zooming in place
Posted by [David Fanning](#) on Wed, 02 Nov 2005 08:32:43 GMT
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a@nothing.com writes:

> Of course there is the Undo/Redo system but you are probably looking for
> something like the Window->Reset Dataspace Ranges. Would that be OK?

Gosh, it is all right there. Odd that I can never find it when I want it. Did you write this stuff? Or, how did you learn about it?

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Subject: Re: Zooming in place

Posted by [pravesh.subramanian](#) on Fri, 04 Nov 2005 00:27:42 GMT

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Wow.... Lots of inputs...! Thank you so much, folks. I really appreciate it.

Subject: Re: Zooming in place

Posted by [ronn](#) on Fri, 04 Nov 2005 02:30:34 GMT

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Sorry for coming in late to this discussion, but Rick mentioned that doing an in place zoom in OG would be easy. And indeed it is! At least for images :) Just cut and copy the code below and you will have a simple zoom in place program for images. Left mouse is a factor of 2, right mouse is 3 and middle is 4.

The trick is to have two views where one is transparent and moveable. I suspect that you could do something similar with regular OG plots, but I haven't tried it.

For the curious, I got this idea driving down a back country road and looking in the rear view mirror. I realized that by putting one view inside another I could display whatever I wanted! And yes, this does prove that I think about IDL way too much....

-Ronn

cut here and save to KROGwindow.pro -----

```

pro krogDrawEvent,event
;event handler
widget_control,event.top,get_uvalue=statePtr

case event.press of
  0 :
  1 : (*statePtr).zoomFactor = 2
  4 : (*statePtr).zoomFactor = 3
  2 : (*statePtr).zoomFactor = 4
  else :
endcase

if event.press ge 1 then begin
  widget_control, event.id, draw_motion_event=1 ;turn on motion
  (*statePtr).oView2->setProperty,hide=0 ;show the zoom view
  ;create an instance of the image view
  (*statePtr).oWin->draw,(*statePtr).oView,/create_instance ;
  ;get the data location
  r = (*statePtr).oWin->pickdata((*statePtr).oView,(*statePtr).oImage,
  $
      [event.x,event.y],xyzLoc)
  ;offset is the corner of the zoom lens
  offset = (*statePtr).kernalSize/2
  ;calculate the zoom lens effect based upon which mouse is clicked
  zoomParam = (*statePtr).kernalSize/(*statePtr).zoomFactor
  ;change the zoom view properties
  (*statePtr).oView2->setProperty, $
      location=[event.x-(*statePtr).kernalSize/2,event.y-(*statePtr).kernalSize/2],
  $
      viewplane_rect=[xyzLoc[0]-(zoomParam/2),xyzLoc[1]-(zoomParam /2), $
          zoomParam,zoomParam]
  ;only draw the changing part
  (*statePtr).oWin->draw,(*statePtr).oView2,/draw_instance

endif else if event.release ge 1 then begin
  ;set everything back to normal
  (*statePtr).oView2->setProperty,hide=1 ;hide the zoom view
  widget_control, event.id, draw_motion_event=0
  (*statePtr).oWin->draw,(*statePtr).oView
endif else if event.type eq 2 then begin
  ;get the data location
  r = (*statePtr).oWin->pickdata((*statePtr).oView,(*statePtr).oImage,
  $
      [event.x,event.y],xyzLoc)
  offset = (*statePtr).kernalSize/2 ;offset is the corner of the zoom
  lens

```

;{{:|{{:|{{:|{{:|{{:|{{:|{{:|{{:|{{:|{{:|{{:|{{:|{{:|{{:|{{:|

oWin->draw,oView

;create a second view that is the size of our zoom lens

kernalSize = 200

zoomFactor = 2.0

oView2=

obj_new('IDLgrView',dimen=[kernalSize,kernalSize],/transparent,viewplane_rect=[0,0,kernalSize/zoomFactor,kernalSize/zoom Factor])

oModel2 = obj_new('IDLgrModel')

;have to add the image object in as an alias since it is already part
;of the model above

oModel2->add, olmage,/alias

oView2->add, oModel2

statePtr = ptr_new({drawId:drawId, oWin:oWin, oView:oView, \$
oView2:oView2, olmage:olmage,
kernalSize:kernalSize, \$
zoomFactor:zoomFactor})

widget_control, base,set_uvalue=statePtr

xmanager,'krOGwindow',base,/no_block
return & end

Subject: Re: Zooming in place

Posted by [David Fanning](#) on Fri, 04 Nov 2005 02:42:20 GMT

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Ronn Kling writes:

> For the curious, I got this idea driving down a back country road and
> looking in the rear view mirror. I realized that by putting one view
> inside another I could display whatever I wanted! And yes, this does
> prove that I think about IDL way too much....

I suddenly realized I knew how to drag direct graphics
text and objects around in a display window, just like they
do in object graphics, when I was standing in the shower
thinking about why I lost that tennis match again. It just
came to me, all in a flash. "Geez", I said to myself, "I
know how to do that!" AnnotateWindow was done in about an hour. I'd
only been thinking about the problem for about five or six years. :-)

Cheers,

David

--

David Fanning, Ph.D.

