Subject: Tip for using Compound Widgets
Posted by MKatz843 on Sat, 03 Aug 2002 19:03:19 GMT
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I do a lot of widget programming in IDL, and I've recently come across
an elegant solution I'd like to share. Others have probably already
thought of this, or may have a better idea, so I hope I'll start a
dialog.

Suppose you have a complex compound widget with lots of differnt
functions. You want to tell it to do all kinds of things, but you
don't want to lose that "black box" aspect that makes cw_widgets so
powerful.

So for each differnt thing I want the widget to do, I encode the
command in the name of a structure and then pass that as a SET_VALUE
in a WIDGET_CONTROL as follows:

```
WIDGET_CONTROL, cw_ID, SET_VALUE={COMMAND_TYPE, arg1:val1, arg2:val2,
. . . }
```

so it might look like one of these:

```
WIDGET_CONTROL, cw_ID, SET_VALUE={NEW_IMAGE, img_ptr:ptr_new(image)}
WIDGET_CONTROL, cw_ID, SET_VALUE={SET_RANGE, range:[0, 16383]}
WIDGET_CONTROL, cw_ID, SET_VALUE={REFRESH_DISPLAY,
VIEWPLANE_RECT=[0,0,10,20]}
```

In order to make this work, a few things are required. Here are some
details.

1) The compound widget function is defined with a SET_VALUE routine.
That is, the first base you declare has a SET_VALUE explicitly set to
a routine that you're using to interpret these commands.

2) I use the IDL-recommended trick of storing a state variable
(generally a big structure with widget IDs and object pointers to
everything that needs to be changed) in the UVALUE of the first child
widget of the main base. I created a function and a procedure to get
and set the first child's UVALUE in one command (see below).
IMPORTANT NOTE: If you use this method, don't forget that every time
you update the state variable, you have to *save it* in the UVALUE of
the base's first child. Otherwise changes could be lost. So every call
of
"state = first_child_uvalue(id)" should be followed by a
"first_child_set_uvalue, base, state".

3) The compound widget's set_value procedure may look like this

```
;-----------
; Procedure to execute commands sent by SET_VALUE keyword to
WIDGET_CONTROL
;
pro cw_test_set_value, base, arg
  state = first_child_uvalue(base, /NO_COPY)  ;--- retrieve state
variable. Use NO_COPY for speed.

  if size(arg, /type) NE 8 then return  ;--- verify that it's a
structure
  case struct_name(arg) of
   'NEW_IMAGE': begin
      . . .
     end
   'SET_RANGE': begin
      . . .
     end
   'REFRESH_DISPLAY': begin
      . . .
     end
   else: print, 'Unknown command in cw_test_set_value'
  endcase

  first_child_set_uvalue, base, state, /NO_COPY ;--- store state
variable. Very Important!

return
end
```

4) The following functions are convenient to use for the above.

```
;-----------
; Return the name of a structure variable
;
function struct_name, a
return, (size(a, /type) EQ 8) ? tag_names(a, /STRUCTURE_NAME) : ''
end

;-----------
; Return the contents of the UVALUE of the first child of base.
;
function first_child_uvalue, base, NO_COPY=NO_COPY
  if not widget_info(base, /VALID_ID) then return, 0
  first_child = widget_info(base, /CHILD)
  if not widget_info(first_child, /VALID_ID) then return, 0
  widget_control, first_child, GET_UVALUE=uval, NO_COPY=NO_COPY
return, uval
```

```
end

;-----------
; Set the contents of the UVALUE of the first child of base.
;
pro first_child_set_uvalue, base, uval, NO_COPY=NO_COPY
  if not widget_info(base, /VALID_ID) then return
  first_child = widget_info(base, /CHILD)
  if not widget_info(first_child, /VALID_ID) then return
  widget_control, first_child, SET_UVALUE=uval, NO_COPY=NO_COPY
end
```

I'd be interested to know if anyone else uses tricks like this, or has
a better way,

M. Katz

Subject: Re: Tip for using Compound Widgets
Posted by David Fanning on Thu, 29 Aug 2002 17:51:41 GMT

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Rob Preece (Rob.Preece@msfc.nasa.gov) writes:

> Good grief! You are *this* close to creating a 'command macro' language
> for your widget objects (something I have been thinking about for some
> time, I might add!). All that is needed is a way to store lists of
> commands, so that they could be replayed at any time. It would be nice to
> edit, store and recall these lists. Finally, think about a *recordable*
> widget program: hit a button, and the following user actions are saved as
> a list of commands, to be available for later replay...

I think you are talking about my LinkedList object
and the LinkedList editor, that is built, but not
available to the public. :-)

Actually, the system we are building does all the
things you mention and more. To "process" an image,
we store "process" objects in its container. You
can add them, remove them, change their order, etc.

We are torn, at the moment, between wanting to become
famous by writing a book that explains all this, or
to become rich by writing programs with the system.
I'll let you know the next time you are in Fort
Collins. :-)

Cheers,

David

--
David W. Fanning, Ph.D.
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Coyote's Guide to IDL Programming: http://www.dfanning.com/
Toll-Free IDL Book Orders: 1-888-461-0155

Subject: Re: Tip for using Compound Widgets
Posted by Paul Van Delst[1] on Thu, 29 Aug 2002 18:36:54 GMT

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David Fanning wrote:
>
> We are torn, at the moment, between wanting to become
> famous by writing a book that explains all this, or
> to become rich by writing programs with the system.

My $0.02... go with the second option. You're already famous. :o)

paulv

--
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Subject: Re: Tip for using Compound Widgets
Posted by David Fanning on Thu, 29 Aug 2002 18:57:15 GMT

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Paul van Delst (paul.vandelst@noaa.gov) writes:

> My $0.02... go with the second option. You're already famous. :o)

You must know my wife. :-)

Cheers,

David

--

David W. Fanning, Ph.D.
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Subject: Re: Tip for using Compound Widgets
Posted by Pavel A. Romashkin on Tue, 03 Sep 2002 16:20:58 GMT

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David Fanning wrote:
>
> I'll let you know the next time you are in Fort
> Collins. :-)

Alas, this does not work. Tried it, but the Coyote found his way out of
the trap :-(
Pavel

Subject: Re: Tip for using Compound Widgets
Posted by David Fanning on Tue, 03 Sep 2002 17:01:35 GMT

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Pavel A. Romashkin (pavel_romashkin@hotmail.com) writes:

> David Fanning wrote:
>>
>> I'll let you know the next time you are in Fort
>> Collins. :-)
>
> Alas, this does not work. Tried it, but the Coyote found his way out of
> the trap :-(

Sorry, I should have said "the next time you are in Fort
Collins and I don't have high school tennis practice,
my own league tennis match, back to school night, and
my nephew's birthday party all scheduled on the same
night." :-)

Cheers,

David

P.S. Let's just say missing Back to School night
to play tennis is considered BAD JUDGEMENT by certain

people around here. :-(

--
David W. Fanning, Ph.D.
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