Subject: Re: object methods as friends
Posted by JD Smith on Tue, 20 Apr 2004 17:05:31 GMT
View Forum Message <> Reply to Message

On Mon, 19 Apr 2004 10:42:24 +1200, Mark Hadfield wrote:

> Zorch Tierod wrote:
>> Hey there,
>> I've got an application that uses two types of objects, each with
>> several different method procedures.
>>
>> What I'm trying to do is to calculate some stuff based on the
>> interaction of one of the objects with an array of the other type of
>> objects. Illustrative example (but not the REAL application!):
>>
>> sb = {bullet, param1:.....} ;protoype for bullet object
>> st = {target, param1:.....} ;prototype for target object
>>
>> target_array = obj_arr('target',10) ;make a bunch of targets
>> projectile = obj_new('bullet') ;make a bullet
>>
>> jtarget = which_hit(target_array, projectile) ;return which target is
>> hit
>>
>> My problem seems to be that the function 'which_hit' has no access to
>> the data of either the 'bullet' or the 'target' objects, because it is
>> not a method of either - and I can't make it a method of both...
>
> The standard way of dealing with this in IDL is to expose the properties
> you need via GetProperty & SetProperty methods. Yes, this can be a lot
> of work and, no, it doesn't allow for discrimination between friend and
> non-friend callers.
>
> I suppose you could have FriendGetProperty & FriendSetProperty methods
> which asked for authentication from the caller, but really, why would
> you bother? If you don't want non-friends to access certain properties,
> then just don't do it.

This isn't really a solution. Accessing a "friend" property via a
method call like GetProperty is far slower than direct structure
access (like 10-20x). This might not be a problem in general cases,
but in the event-driven world of IDL widget objects, you might need to
lookup info from a friend or composited class 10-100 times a second in
an event callback.

Typically, to avoid this speed penalty, you feel motivated to create a
local cache of the other object's info, which isn't really the best
solution, since it requires you to know how frequently and when that

object's class data is changing. This has bitten me more than once.
And moreover, if you receive a pointer to your friend or composited
object's data, you have to remember what the policy on freeing that
pointer is: probably you should leave it up to the other object
(unless of course he created it specially for you!). I have too many
sections of code that look like:

```
self.myObj->GetProperty,SOMEVAR=somevar
self.somevar=somevar
```

I'm not sure what the solution to this is. Ideally, all object data
access is encapsulated behind method calls: this is the thinking that
likely went into IDL's OOP paradigm (and others, like SmallTalk).
However, most OOP languages tend to relax this somewhat, for exactly
this reason: sometimes you just need to get the data fast! It's very
possible (likely even) to abuse this freedom, but it's also likely
that without it you'll create brittle workarounds like locally caching
important data.

One idea I like is the "Uniform access principle" which states that
"All services offered by a module should be available through a
uniform notation, which does not betray whether they are implemented
through storage or through computation." I.e. make data access just
like method (well, method function) calls:

```
class={myClass,$
      INHERITS superclass,
      PUBLIC Image: ptr_new(), $
      other_private_data:0.0}

function myClass::PI_total
  return,!PI*total(*self.Image)
end

IDL> o=obj_new('myClass',dist(100))
IDL> print,o->PI_total()
IDL> myim=*o->Image()
IDL> *o->Image()=dist(200)
IDL> print,o->PI_total()
```

If later you decided to change the internal storage mechanism of
Image, you could then make it a method call instead of just PUBLIC
data. And of course these "pseudo" method calls would translate into
instance structure dereference and not have the traditional speed
penalty of method calls. Efficiency comparable to structure
dereference may not be possible given the need to determine if the
call is traditional or pseudo, but I'm sure this can be relegated to
compile time rather than run-time.

Anyway, that's my proposal.

JD