

Re: What if black holes are just a glitch in the matrix?

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- *From:* The Ghost In The Machine <[ewill@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:ewill@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx)>
  - *Date:* Sun, 29 Oct 2006 10:16:18 -0800
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In sci.physics, Sam Wormley  
<[swormley1@xxxxxxxx](mailto:swormley1@xxxxxxxx)>  
wrote  
on Sun, 29 Oct 2006 13:58:14 GMT  
<[Wr21h.122050\\$aJ.16310@attbi\\_s21](mailto:Wr21h.122050$aJ.16310@attbi_s21)>:

StarbladeEnkai@xxxxxxxx wrote:

Sam Wormley wrote:

Ed Zagmoon wrote:

This whole world is a computer program that  
is running since  
billions of years

Computer programs are deterministic...

Nothing is deterministic.

Write a non deterministic computer program starblade.

I should point out here that this is partially a hardware problem.  
:-)

For example, one could do something along the lines of the following.

```
char data[1024];

for(int i = 0; i < 1024; i++)
{
for(int j = 0; j < 8; j++)
{
```

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```
int k;

asm {
IN #12345, k;
}

data[i] <<= 1;
if(k&0x80) data[i] |= 1;
}
}
```

where port 12345's 7th bit is hooked into a flipflop fed by a neon-capacitor trigger, or perhaps one would prefer a mica/gas trigger similar to those used in Geiger counters, feeding said flip-flop. Either way, the program executes in slightly unpredictable time and leaves after the execution a populated data array that is completely random — or as random as the randomizing device feeding it allows.

There are also unintended side effects — many of them usable in machine attacks. For example, the mostly useless function:

```
int f() {
char data[1024];
if(fgets(data, 2048, stdin) == NULL) /* whoopsie! */
return -1;
return strlen(data);
}
```

would result in corruption of the stack somewhere below data; depending on machine architecture this would either have little effect (HP PA Risc running HP/UX) or result in the program executing an arbitrary machine location (most other machine types).

Fortunately C provides sizeof(); the above is more correctly written

```
int f() {
char data[1024];
if(fgets(data, sizeof(data) - 1, stdin) == NULL)
return -1;
data[sizeof(data)-1] = '\0'; /* just in case */
return strlen(data);
}
```

Since fgets() is carefully specified, one can also get away with the slightly simpler

```
int f() {
```

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```
char data[1024];
if(fgets(data, sizeof(data), stdin) == NULL)
return -1;
return strlen(data);
}
```

if the library is known to be bug-free in that area.

There are also other effects such as referencing a free pointer. In a single-threaded OS (these are extremely rare nowadays) sans such things as interrupts one might very well be able to reproduce an effect every time, but interrupts, multithreading, I/O processing, and memory sharing make life interesting for the modern programmer. :-)

No doubt you're also familiar with the classical Halting Problem. Even in the context of a deterministic Turing machine, which is essentially a non-modifiable-code single-threaded non-interruptible device, one can't algorithmically determine whether it will halt or not, even though one knows that

- (a) it must halt or run forever, and
- (b) given the same input, state set, start state, and transition function it will always do exactly the same thing.

And yes, there are non-deterministic Turing machines, as well as other such variants; such are often used in parsing. For example, an acceptor for the regular expression

?\*abcde?\*

can be easily modeled as an 8-state nondeterministic machine. It is of course converted into a deterministic machine during execution, either prior to actual run of the machine, or by simply maintaining a set of active states while the machine chews on the input string.

```
[]12abcde34 {0,1}
[1]2abcde34 {0,1}
1[2]abcde34 {0,1}
12[a]bcde34 {0,1}
12a[b]cde34 {0,1,2}
12ab[c]de34 {0,1,3}
12abc[d]e34 {0,1,4}
12abcd[e]34 {0,1,5}
12abcde[3]4 {0,1,6,7}
12abcde3[4] {0,1,7}
12abcde34[] {0,1,7}
```

(Or something like that.)

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#191, ewill3@xxxxxxxxxxxxxx

Windows Vista. Because a BSOD is just so 20th century; why not try our new color changing variant?

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