

Re: complexity of numerical software

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Jaap Spies wrote:

David N. Williams wrote in a reaction to carlos@xxxxxxxxxxxxx:

I'm really puzzled by your classification of numerical software.
I would have put it in the truly challenging category!?

-- David

Numerical software? What kind of numerical software you are talking about?

There is a lot of well known algorithms you can find in Knuth's bible TAOCP or elsewhere. You do not have to invent the wheel again and again.

Testing and debugging of numeric algorithms is easy. Just check the results.

For example a 'difficult (according to my former students)' problem for the average programmer:

Do something to proces alle n-subsets of a m-set.

```
problem(int n, int m)
```

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```
{
    int i, j;
    int *c;

    // this algorithm generates all possible n-subsets
    of the set {1,2,...m}
    // it is based on algorithm L from Knuth's taocp
    part 4: 7.2.1.3 p. 4
    // to be publiced (see his homepage)
    // Lexicographic combinations
    c = (int *) malloc((n+3)*sizeof(int));
    // L1. Initialize
    for(j=1; j<=n;j++)
    c[j] = j-1;
    c[n+1] = m;
    c[n+2] = 0;
    j = 1;

    while(j <= n)
    {
        // L2. Visit
        proces(c, n, m);
        // L3. Find j
        j = 1;
        while(c[j]+1 == c[j+1])
        {
            c[j] = j-1;
            j++;
        }
        // L5. Increase c[j]
        c[j] += 1;
    }
}
```

Difficult? It's trivial with the right education.

Maybe it would be interesting to know your definition of "numerical software"...

Jaap Spies

Re: complexity of numerical software

'Jaap' is pronounced (in Dutch) as 'ya' from 'yard' followed by a 'p' from 'cap' (phonetic: ja.p).

'Spies' sounds like an 's' followed by the word 'peace' (spi:s).