A New Programming Language for Computer Simulation

Author: Thomas, Engel, M.D.

This project is a new programming language for computer simulation, with a parser and an interpreter for the language. The language is as simple as possible. The idea is that a practitioner can write only the equations for a system and the interpreter will handle all of the details of numerical integration, programming, input and output.

The simulation language is designed to be as simple and clear as possible. The language is line-oriented and has a very regular syntax.

This is a simple example program:

```csharp
# Simple rocket.
mass_of_rocket = 100
thrust = if time < stop / 2 then 1000 else 0
gravity = 9.8 * mass_of_rocket
acceleration = (thrust - gravity) / mass_of_rocket
velocity = integral of acceleration, initial 0
altitude = integral of velocity, initial 0, minimum 0
```

This is the result of running a three compartment pharmacokinetic model for 100 mg injection of propofol in a 70 kg adult.

The simulation language capability is in a separate software library that can be embedded in other applications. The library supports iterated function systems, fuzzy logic, parametric equations, integrals, derivatives and complex models. The software is complete. A command line tool is included with the library.