LiveGraph

a tool for data visualisation, analysis and logging in simulation models

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Simulation is an essential tool in life sciences research. And the hardest, most time-consuming part of simulation development is the user interface, especially monitoring tools and visual display.

Several visualisation frameworks are available, however, they usually require extensive data preparation from the model developer and trade off powerful functions for a complex, slow-to-use user interface. Such frameworks are targeted at post-simulation data analysis.

The LiveGraph framework for exploratory data analysis has been developed by the Complex Systems research group at Monash University. It combines several features that are (at least in combination) missing in other products:

- A plotter that automatically updates graphs of simulation outputs in real-time.
- A concise and simple point-and-click interface that allows users to quickly select and compare data series even in simulations outputting over 1000 series simultaneously.
- Transformation of data series for visual comparison, or application of feature detection by the virtue of a single click.
- The framework is Java-based and can be run on any computer system. However, it is easily integrated with simulations written in any programming language.
- LiveGraph reads files in a simple CSV-style format. For simulations written in Java it provides an API that handles data logging.

These features make the LiveGraph system particularly useful while exploring the parameter space of a simulation model. LiveGraph is a generic tool that allows researchers to direct their effort to actual models, not visualisation.

LiveGraph has been released as an open-source project in March 2007. Since then, over 3000 downloads and an increasingly active user community have confirmed that the framework is useful.

Depending on particular interests of the participants, the tutorial will cover the following topics:

1. Efficient model development: choosing the right tools.
2. Exploratory vs. quantitative data analysis: two *very* different tasks.
3. Using LiveGraph to monitor you simulation in real-time.
4. Using LiveGraph for making sense of vast quantities of data.
5. Embedding LiveGraph with your non-Java simulation software.
6. Embedding LiveGraph with your Java-based simulation software.

According to particular interests of the participants the above topics can be covered on different levels of abstraction, ranging from a conceptual overview to hands-on coding exercises.

For more information please visit http://www.live-graph.org.

Presenter's biography:

Greg Paperin has obtained his undergraduate and his Master's degree in Computer Science from the University College London. In the following years he has worked as a consultant and software solutions architect for a number of national and international companies in the UK and Germany. In 2006 Greg moved to Melbourne where he commenced his studies towards a PhD degree at Monash University. Greg's main research interests include artificial life, complex systems, biological and artificial evolution. He has also an on-going interest in engineering of software-intensive systems and the design of software-supported business processes.