

tempusTM

the all-purpose simulation tool

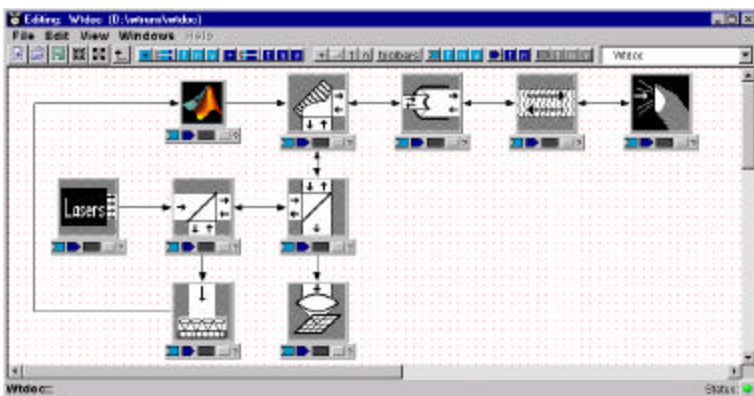
The Challenge of Multidisciplinary Simulation

Computer simulation has become an important tool in many fields of endeavor, from science and engineering to computer based training and computer animation. Over the years considerable progress has been made in tools and methodologies for simulation, but much of this progress has come in the form of improvements to a variety of relatively specialized tools, for modeling control systems, flexible structures, fluid dynamics, communication networks, and so forth. By comparison, relatively little progress had been made in tools designed to support *multidisciplinary* simulation, involving interactions among subsystems with qualitatively dissimilar behaviors and requiring differing modeling approaches. This is easy to understand, because it is a hard problem, and ill-defined. But for some classes of applications, it is crucial.

The Solution is tempus

In the 1980's, a class of simulation tools appeared which took a step in the right direction, adopting an architecture based on *block diagrams*, an idea borrowed from systems engineering; examples include SimulinkTM, SystemBuildTM, Easy5TM, and BOSSTM. Superficially, these tools look like promising candidates for multidisciplinary simulation, because the block diagram paradigm itself is very general, and intuitive to most engineers and scientists. Upon closer examination, however, it turns out these tools work well only for certain restrictive classes of systems, such as digital control systems. This is no criticism – that is precisely what they were designed for.

tempus also uses a block diagram-based architecture, but one much more powerful and flexible, designed to meet the demands of multidisciplinary simulation. Combining ideas from object-oriented programming and hybrid simulation, tempus can be used to model just about anything. It also has an open architecture, which makes it easy to integrate other software into tempus, and vice versa.



tempus runs on...

- Windows-NT/2000/95/98
- Linux
- AIX (including SP computers)
- SGI

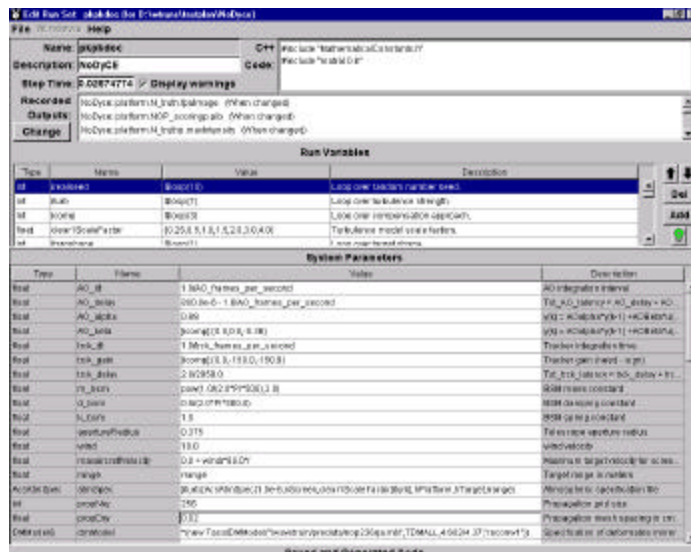
tempus provides...

- Connect-the-blocks model building.
- Flexible behaviors: systems can be input-driven, output-driven, event-driven, or all of the above.
- Flexible interactions: systems can have any number of inputs, outputs, and parameters, which can be of any C++ types, including class types.
- Extensibility: users can add components using C++, C, Fortran, or MatlabTM m-files.
- Open architecture.
- Automated parameter studies.
- Analysis and development in Matlab.



and coming soon ...

- Differential-algebraic equations
- Runtime interaction and debugging
- Use Simulink s-functions inside tempus
- Use tempus systems inside Simulink and Matlab
- Distributed simulation



tempus is Proven Technology

tempus has been in use on demanding real world simulation problems since 1996, and draws upon lessons learned from two previous full scale prototypes which were used in a wide variety of simulation efforts. This includes laser weapons R&D, experiment design, satellite communications networks, and training environments for satellite operators, with detailed physics-based satellite models.

tempus serves as the foundation for WaveTrainTM, MZA's tool for high fidelity modeling of advanced optical systems, which is being used by the Air Force Research Laboratory in support of its directed energy experiments and weapons programs.

Contact MZA for more information about tempus

tempus@mza.com
www.mza.com
(505)245-9970

