BIOINFORMATICS AND HIGH PERFORMANCE COMPUTING

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PROBLEM SOLVING ENVIRONMENTS

Definition (Rice and Boisvert, 1996): "A problem solving environment is a computational system that provides a complete and convenient set of high level tools for solving problems from a specific domain. The PSE allows users to define and modify problems, choose solution strategies, interact with and manage appropriate hardware and software resources, visualize and analyze results, and record and coordinate extended problem solving tasks. A user communicates with a PSE in the language of the problem, not in the language of a particular operating system, programming language, or network protocol."

EXAMPLES

- **WBCSim**: wood based composites manufacturing processes.
- **Vizcraft**: high speed civil transport (HSCT) aircraft design.
- **L2W**: watershed land use management (hydrology, biology, economics).
- S^4W: wireless communication system design.
- **Expresso**: microarray experiment management.
- **JigCell**: eukaryotic cell cycle modelling.

RELATED RESEARCH THEMES

- Ordinary differential equation (ODE) modelling of chemical reaction networks.

- Deterministic (DIRECT) and nondeterministic (genetic algorithm) algorithms for global optimization.

- Orthogonal distance regression and model parameter estimation.

- High performance parallel computing.