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Research Area: Computational biology / modeling and simulation

The primary goal of this project is to develop a parallel exact stochastic simulation (ESS) algorithm for modeling gene networks on a genome scale. The objectives are:

- (a) design and implement a parallelization strategy, and
- (b) study the scalability of the code on different hardware architectures including the SGI Altix 'RAM' and the IBM Power4 'Cheetah.'

Specific tasks include:

1. Learn to use the existing serial ESS program
2. Become familiar with stochastic and ordinary differential equation methods
3. Explore parallel computing and programming paradigms
4. Design a parallelization strategy using the discrete event simulation methodology
5. Write the driver for the Parallel ESS
6. Test the performance of PESS on different machines
7. Begin writing a research paper for future publication

Research Mentors:
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