Project Title

GPU based elementary flux mode analysis

Project Description:

Computational methods to engineer cellular metabolism promise to play a critical role in producing pharmaceutical, repairing defective genes, destroying cancer cells, and generating biofuels. Elementary Flux Mode (EFM) analysis is one such powerful technique that has elucidated cell growth and regulation, predicted product yield, and analyzed network robustness. EFM analysis, however, is a computationally daunting task because it requires the enumeration of all independent and stoichiometrically balanced pathways within a cellular network. In this project students will be implementing EFM analysis algorithm on GPU.

Duties/Activities:

- Reading
- Software development
- Testing and debugging

Required Skills:

- C++
- Some knowledge of multithreading
- Some knowledge of microprocessors/computer architecture
- Linear algebra

Learning Opportunities:

- Linear algebra
- Data structures
- Parallel programming
- Software optimization
- Multi-disciplinary research
- CUDA and GPU programming

Expected Team Size: *At most 2*

Mentors

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