

Student Project: Implementation of Biological Simulation Algorithms

Evolutionary Systems Biology Group - UW Madison



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Overview

The Evolutionary Systems Biology Group is looking for students with a background in mathematics, chemical engineering or related disciplines who are interested in implementing simulation algorithms in C++. The objective is to simulate a model that specifies an initial value problem and which is already available in an internal data format from within C++. A number of deterministic or stochastic algorithms could be implemented as part of this project, from calling ODE solvers to stochastic simulation algorithms, all of which are well documented.

The goal is to provide a variety of basic simulation algorithms for a system that will make it easy for biologists to use these algorithms for modeling.

For more information on the Evolutionary Systems Biology Group, please visit <http://evolution.ws/people/loewe>

Responsibilities

If you join this effort, you:

- Must know C++ or be highly motivated to learn it very quickly (and have other programming skills that would enable you to do this)
- Will learn how to use version control and other tools used for development in the lab
- Will be assigned a simulation algorithm of your choice
- Implement the algorithm and link it to the data structures that specify the model and report output
- Will learn to use some of the state-of-the-art programming libraries
- Will write your code in a readable manner and properly document it, so that it passes peer review
- Will share your expertise with peers and help peer review their code as well.

Compensation and Hours

This work is for credit or experience, but not for pay. The general expectation is about 80 hours per credit earned. However, depending on the algorithm chosen and your previous C++ experience, the work required could exceed typical times of for-credit summer placements. To be successful will require flexibility and the determination to carry this through to completion, as these tasks are not easily reassigned. You will need your own computer or to use campus computing resources. There will be a trial period at the beginning of the project during which either you or the EvoSysBio Group can choose to discontinue the work arrangement if it's not a good fit.

Contact

If you are interested, please send your CV or resume to Seth Keel at skeel@discovery.wisc.edu with a brief (3-6 sentence) statement of interest. Feel free to contact Seth via email or phone (608) 316-4326 if you have any questions. If your application is successful, we will contact you for an interview. Any updates or changes to this job will be posted at <http://evolution.ws/people/loewe/jobs>