

PopGen Simulator

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The PopGen Simulator is a GUI-based (graphical user interface) interactive tool for teaching students about population genetics and computer simulation. Students use the program to simulate the growth and evolution of a population at the genomic level. Users select between a variety of different models, specify the parameters of the model, and visualize the results. The simulator was used in several lab exercises for the Brown University Course “Computational Theory of Molecular Evolution and Population Genetics,” where students used the simulator to reinforce concepts and validate mathematical reasoning. For example, in one laboratory exercise students ran multi-locus simulations with a variety of mutation rates and number of loci, and reasoned about the resulting population evolution. In addition to its teaching applications, the PopGen Simulator can also be used to generate synthetic data and includes an API (Application program interface) that researchers can use to quickly prototype and visualize their models. The simulator is written in MATLAB, and also includes a command line component.

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