BRIAN CRUTCHLEY & QING WANG, Dept. of Computer Sciences, Mathematics and Engineering, Shepherd University, Shepherdstown, WV, 25443. Software Developed to Facilitate Calibration of Tumor Growth Models

Impulsive ODEs can be used to model complex real-world behaviors such as tumor growth and provide insights into how therapies work. Additionally, these models can be enhanced through complementary software that is able to better manipulate the large sample spaces their parameters tend to have. This project seeks to develop a series of software to numerically solve multiple newly developed tumor models and facilitate the simulation of model calibrations against experimental data. The impulsive ODE solver is accomplished by using the Runge-Kutta method to approximate solutions to the models and leveraging computational power to achieve higher precision and speed. The series of software help with data input, output, transfer, speedy pick of optimal calibrations, and graphing in the simulation of a couple of tumor models. *The project was supported by NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence and the Research Challenge Fund through a Summer Undergraduate Research Experience Grant from the West Virginia Higher Education Policy Commission Division of Science and Research.*