BRIAN CRUTCHLEY and QING WANG, Dept. of Computer Sciences, Mathematics and Engineering, Shepherd University, Shepherdstown, WV, 25443. Developing Software to Numerically Solve a System of Impulsive Ordinary Differential Equations

Mathematical models can be used to simulate complex real-world behaviors and provide insights into how these behaviors 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 software to numerically solve multiple newly developed Cancer models. This 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 result of this software will be numerical solutions of the new models that can be used to screen optimal treatment strategy based on calibrated cancer models using impulsive ODEs. 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.