

PhysicsSim Abstract

Understanding and interpreting relationships and functional trends with 2-D graphs are foundational skills in STEM fields, in other sciences and in all disciplines that utilize data analysis. Introductory physics courses regularly start with the topic of kinematics which heavily utilizes 2-D graphs that describe motion. This is why difficulties that students face in understanding 2-D graphs surface early on in physics. Yet, for this same reason kinematics can be used as a great opportunity to teach graphing skills in general. The primary goal of this project is to develop an interactive intelligent tutoring system (PhysicsSim) that makes use of kinematics to help students understand the nuances of motion types and their graphical representations. A secondary goal is to evaluate the efficacy of PhysicsSim in teaching the students by evaluating their learning. The proposed system allows for personalized learning experience in an environment that combines video tutorials and interactive animations with guided exercises and problems to practice the skills. Effectiveness of the PhysicsSim will be tested in Introductory Physics classes in Spring 2020. The results will enable us to enhance the system to provide maximum support and optimal learning for students.