With the help of the project, we developed a racing game platform for control education of middle-school students. In this platform, every car has separated stirring control, acceleration control, and throttle control, which gives students flexibilities to test/design various control schemes. We also included models for various communication channels, which allows students to test cooperative control schemes for connected vehicles under different communication channels. The platform synchronizes simulations so that they run in real time, and gives the look and sound of commercial video racing-car games. Two screen shots of the developed platform are given in Fig. 1. Using this computer game platform, students can see and sense the basic elements of automatic control in an everyday object (a car): the sensor, the controller, and the actuator. Students can also design and test out various control strategies on the cars and check the corresponding steering outcomes with fun.

![Screen shots from the developed video game platform for control education](image)

The game education platform was used in outreach activities to about 100 middle-school students in 2017 (February 18, 25, and June 18-25) at Clemson University through university-organized outreach programs “Girl Scouts” and “STEM Days.” A sample program is given in the appendix. Some pictures on the outreach days are given in Fig. 2. The exit survey shows that the middle-school students become more interested in control and STEM.
Fig. 2. Photos for one of the Girl Scouts days.

Fig. 3. Photos for one of the STEM days.
Appendix: The sample program for one of the outreach activities to middle-school girls (Girl Scouts)

Welcome!

Hello, my name is Serita Acker, and I am the director of the PEER & WISE program here at Clemson University. I would like to welcome you to our campus. We hope you enjoy the activities we have set up for you to learn about many different fields of engineering and science.

Have a Great Day!

Serita Acker