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Research Article

Experiential Learning in Vehicle Dynamics Education via Motion Simulation and Interactive Gaming

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Abstract

Creating active, student-centered learning situations in postsecondary education is an ongoing challenge for engineering educators. Contemporary students familiar with visually engaging and fast-paced games can find traditional classroom methods of lecture and guided laboratory experiments limiting. This paper presents a methodology that incorporates driving simulation, motion simulation, and educational practices into an engaging, gaming-inspired simulation framework for a vehicle dynamics curriculum. The approach is designed to promote active student participation in authentic engineering experiences that enhance learning about road vehicle dynamics. The paper presents the student use of physical simulation and large-scale visualization to discover the impact that design decisions have on vehicle design using a gaming interface. The approach is evaluated using two experiments incorporated into a sequence of two upper level mechanical engineering courses.