Identification of Wheel Spinning Cases while Learning and Retaining a Skill in Intelligent Tutoring Systems

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Abstract

Wheel Spinning, by definition [1] means a situation where in the students may not reach mastery in reasonable amount of time. The Wheel Spinning is unproductive and may lead to frustrating experience to some students, in particular dyslexics, since they have difficulty in memorizing and thinking skills. If the wheel spinning can be identified early, then they may be offered some other mode of instruction such as remedial intervention by the teacher, peer tutoring method or incorporating personalized styles of instruction. The aim of this work is to extend wheel spinning concept to enhanced mastery cycle and to design more accurate personalized retention schedules. This study was conducted using real world data from Personalized Adaptive Scheduling System(PASS) a newly introduced module ASSISTments, web based tutoring system. Application of the state-of-the-art machine learning approaches such as deep learning and random forest are investigated on the extracted features for modeling wheel spinning cases. Experiments demonstrate that Random Forest model can predict mastery or wheel spinning at an early stage with an AUC of 0.87.
References


Index Terms

Computer Science  
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Keywords

Wheel Spinning, Personalized Adaptive Scheduling Systems, Deep Learning, Random Forests