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Tracking student progress in a game-like physics learning environment with a Monte Carlo Bayesian knowledge tracing model[1] GEY-HONG GWEON, HEE-SUN LEE, Univ of California-Santa Cruz, CHAD DORSEY, ROBERT TINKER, WILLIAM FINZER, DANIEL DAMELIN, The Concord Consortium — In tracking student learning in on-line learning systems, the Bayesian knowledge tracing (BKT) model is a popular model. However, the model has well-known problems such as the identifiability problem or the empirical degeneracy problem. Understanding of these problems remain unclear and solutions to them remain subjective. Here, we analyze the log data from an online physics learning program with our new model, a Monte Carlo BKT model. With our new approach, we are able to perform a completely unbiased analysis, which can then be used for classifying student learning patterns and performances. Furthermore, a theoretical analysis of the BKT model and our computational work shed new light on the nature of the aforementioned problems.

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