Knowledge Tracing Machines: towards an unification of DKT, IRT & PFA

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Abstract. The goal of this tutorial is to make you compare typical baselines for predicting student performance (item response theory, performance factor analysis) on famous datasets, and replace some blocks of their architectures with deep neural networks (deep knowledge tracing, deep factorization machines). Hopefully we can understand where neural networks improve the predictions substantially, and where they do not. No knowledge of educational models is needed, an experience of Python is preferred. All code can be retrieved at https://github.com/jilljenn/ktm.

Keywords: Item response theory · Deep knowledge tracing · Predicting student performance.