**TRIANGULAR LEARNER MODEL**

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***ABSTRACT***

User model is description of users’ information and characteristics in abstract level. User model is very important to adaptive software which aims to support user as much as possible. The process to construct user model is called user modeling. Within learning context where users are learners, the research proposes a so-called Triangular Learner Model (TLM) which is composed of three essential learners’ properties such as knowledge, learning style, and learning history. TLM is the user model that supports built-in inference mechanism and so the strong point of TLM is to reason out new information from users, based on mathematical tools. This paper focuses on fundamental algorithms and mathematical tools to construct three basic components of TLM such as knowledge sub-model, learning style sub-model, and learning history sub-model. For instance, knowledge sub-model is combination of overlay model and Bayesian network in which overlay model structure is translated into Bayesian network and then each aggregation relationship between domain elements in overlay model is signified by conditional probability table of each node in Bayesian network via a so-called SIGMA-gate inference conversion. Learning style sub-model representing learners’ cognitive and psychological factors is constructed by hidden Markov model to implement psychological theory of Honey-Mumford and Felder-Silverman. Learning history sub-model is the most important one which is used to construct knowledge sub-model and learning style sub-model, in which learning history is defined as a transcript of all learner’s actions such as learning materials accesses, duration of computer use, doing exercises, doing tests, communicating with teachers or classmates. In general, the paper is a summary of results from research on TLM and so algorithms and formulas are described by the succinct way.

Keywords: user model, user modeling, adaptive learning, knowledge, learning style, learning history.

**Biography**

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| Loc Nguyen  Founder of Loc Nguyen’s Academic Network, Vietnam  Loc Nguyen is an independent scholar from 2017. He holds PhD degree from 2009 and Postdoctoral degree from 2013 (certified by INSTICC) in computer science. He was granted as Mathematician by London Mathematical Society for Postdoctoral research in Mathematics from 2016. He was awarded as Professor by SciencePG from 2016. | A close-up of a child smiling  Description automatically generated with medium confidence |

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