

MPT & SRA: Research, Development, and Selected Applications

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In this presentation, I will first introduce some basic concepts of Multinomial Processing Tree (**MPT**) models and Semantic Representation Analysis (**SRA**). **MPT** models are a family of mathematical/statistical models that are specially designed for analyzing categorical observations in social sciences and psychology. A special application of such model can be used to measure students' cognitive capabilities. **SRA** is a general framework for semantic analysis. Within this framework, semantic similarities between semantic spaces can be measured. In addition, the **SRA** framework makes it possible to semantically decompose written texts and to create individualized domain-specific context-sensitive semantic processing facilities. These facilities are ideal for semantically evaluating students' contributions in Advanced Learning Environments (**ALE**), such as intelligent tutoring systems (**ITS**). **SRA** served as enabling theory and technology for most of the applications in the Institute for Intelligent Systems (**IIS**). During the second half of the presentation, I will introduce a few relevant and on-going **ALE** projects in **IIS**.