Chapter 6 – Understanding Current Learner Modeling Approaches

Lijia Wang, UM

Overview

- **Understanding Current Learner Modeling Approaches**

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Motivations for a Generalized Intelligent Framework for Tutoring (GIFT) for Authoring, Instruction and Analysis

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Overview

- Section 1
  - What has been done by the author(s)?
- Section 2
  - What is the theoretical foundation of the chapter?
- Section 3
  - What is (are) the basic assumption(s) of the chapter?
- Section 4
  - What would you do to improve the article if you write it today?

What has been done

Current State of Learner Modeling Research

- Purposes

- Techniques and methods

- Expectation
  - Comphensive
  - Flexible

What has been done

Review of the following chapters

- Present a framework for modeling interlocutors

Chapter 7

- Highlight the importance of a standard for learner model

Chapter 8

What has been done

Review of the following chapters (Cont'd)

- Presents an Air Force Research Laboratory (AFRL) research effort: Large-Scale Cognitive Modeling (LSCM)

Chapter 9

- Multi-agent architecture & analysis two new dimensions: novelty and relevance.

Chapter 10

What has been done

Recommendations for GIFT

- Incorporate the Affective-Behavioral-Cognitive (ABC) model to observe learner performance to determine learner's states more effectively

- Spread the use of GIFT to collect more data to understands factors influence the learning process and how those factors dynamically change during the instruction.

What has been done

Recommendations for GIFT (Cont'd)

- Adopt a common agent communication language

- Integration of AFRL's LSCM/RML and ARL's GIFT to solve the monitoring problem of GIFT

What is the theoretical foundation

- Two categories for the content within learner model:

1. Domain-specific

   - Domain knowledge, Skill measured over time, misconception, solving strategies, etc.

2. Domain independent information

   - Learning goal, motivation, interests, preference, behaviors, etc.

What is the theoretical foundation

- ITS history
  - 1st generation ITS
    - Focus on learner's performance and domain knowledge states
    - Lack strategic, diagnostic, or predictive capabilities
- Primary sub-research field
  - Learner state classification
  - Assessments
  - Etc.

What is (are) the basic assumption(s)

No general assumptions for Chapter 6

Two-part questions the research community continues to help address:

- What aspects of the learner should be modeled?

and

- How can we achieve the best possible levels of state and performance classification and predictive accuracy?

Improve the article

- Try some new dimensions to measure/locate the learner's states.

    – Based on the *novelty* and *relevance*.

- How to make real time interaction without large computation

Improve the article

- Some thoughts about the two part questions
  - What aspects of the learner should be modeled?
    - Core aspect(s): Domain knowledge & skills
    - As much as we want

Improve the article

- Some thoughts about the two part questions
  - How can we achieve the best possible levels of state and performance classification and predictive accuracy?
    - Diligent work from the whole research community
    - Countless data and calculation resources.

Thank you so much