The SINTEC Personalized, Knowledge-Based E-Learning Environment

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Knowledge-Based e-Learning

- Knowledge based systems
- Student modeling
- Reasoning for:
  - Student diagnosis
  - Explanations generation
  - Lesson planning
- Intelligent interfaces
Learning is a knowledge centered activity:

- One of the main goals of a learning process is the articulation in the learner’s mind of a body of knowledge for the considered domain.
- The skeleton of this body is usually a semantic network of the main concepts involved in that domain - **ONTOLOGY**
"An ontology is a specification of a conceptualization....That is, an ontology is a description (like a formal specification of a program) of the concepts and relationships that can exist for an agent or a community of agents" (Gruber)
Ontologies used in e-Learning

- Domain
- Tutoring
- Human-computer interfacing
- Lexical
- Upper Level
Personalized texts for e-Learning

Are adapted to each users':
- knowledge - student model
- learning style
- psychological profile
- goals (e.g. lists of concepts to be learned)
- level (novice, expert)
- preferences (e.g. style of web pages)
- context of interaction
Student model

- Keeps track of the concepts known, unknown or wrongly known by the student (Dimitrova, Self, Brna, 2000)
- Inferred from results at tests or from interaction (visited web pages, topics searched etc.)
- Is usually defined in relation with the domain ontology (concept net, Bayesian net)
Intelligent e-Learning Projects at CS-Polytechnic University & ICIA

- MacPAIL
- ITS for programming
- WebGen
- LARFLAST
- SINTEC
- EU-NCIT
- COOPER

- INFOSOC- Funded Project
- Includes experience from ITS and LARFLAST
- Partners:
  - CS Dept., “Polytechnica” Univ. Bucharest
  - Romanian Academy Institute for AI
  - Romanian Academy Psychology Institute
  - SIVECO S.A. Romania
- Continued in FP6 SSA EU-NCIT
SINTEC

- Collaborative tools for distance and distributed e-Learning
- Web services technology for distributed processing knowledge (ontologies) from the (Semantic) Web
- Content creation and reuse from the web, according to metadata standards for e-Learning like IMS, ARIADNE, SCORM, AICC
- ITS technology (student modelling and inference)
- Text Mining:
  - intelligent search of learning materials on the web
  - knowledge extraction
  - categorization
  - summarization
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Learning-style inventory

Our platform can adapt to your learning style and abilities. Please complete the test below to help us create your profile. Rank a 4 for the sentence that describes you the best down to 1 for the one that describes you the least.

1. When I learn:

   1  I like to deal with my feelings  2  I like to think about ideas  3  I like to be doing things  4  I like to watch and listen

2. I learn best when:

   2  I listen and watch carefully  3  I rely on logical thinking  1  I trust my hunches and feelings  4  I work hard to get things done

3. When I am learning:

   4  I tend to reason things out  1  I am responsible about things  2  I am quiet and reserved  3  I have strong feelings and reactions

4. I learn by:

   4  feeling  2  doing  1  watching  3  thinking
You are enrolled in the Algorithm Analysis (#31) since Sunday, November 2, 2003.

Course details
Description: Introduction to fundamental algorithms and computation issues. Direct application into graphs, trees, network flow algorithms.
Instructor: Prof. Stefan Trausan Matu
Teaching Assistants: Ruxandra Imany
Grading information: Maximum grade is 10. Minimum passing grade is 5. Maximum points available: 120.

Communication central
Forum: AA-discussion list
Chatroom: AA chat
Discussion transcript available for AA chat for Thursday, December 4 2003: click here.

Scheduled events
Recitation scheduled for Thursday, December 18 2003 at 11:00 GMT+2.
This event repeats for the following period: every week.

My activity
You have currently completed 54% of the activities. You have currently 58 points out of 60.
Your discussion participation details: 2 messages posted.
Work on activities: Notes for this course
You have currently completed 34% of the activities. You have currently 58 points out of 60.
Course: Database Fundamentals

Description: Familiarization of students with the basic principles of databases and some theoretical knowledge for better understanding DBMS systems. The course covers topics such as basic database principles, data model planning (including E-R data model diagrams and the net data model), relations and operations for relations (joins, product, difference, projection, etc.), transactions and serializability, distributed databases issues.

Period: Wednesday, September 17 2003 - Monday, October 6 2003

Status: Completed

Final grade: 9.45

Percentile: 92%

Detailed grades:

Activity #213.A: From E-R to relational models (homework): 9 (2.4 credits)  
Activity #213.B: Queries and subqueries (homework): 10 (2 credits)  
Activity #213.C: SQL Statements (homework): 10 (2 credits)  
Activity #213.D: Constraints (homework): 6 (1.45 credits)  
Activity #213.E: Implementing in DBS (project): 8 (1.6 credits)

Course: Algorithm analysis

Description: Introduction to fundamental algorithms and computation issues. Direct application into graphs, trees, network flow algorithms.

Period: Sunday, November 2 2003 - ?

Status: In progress

Detailed grades:

Activity #31.A: Optimization of Dijkstra algorithm (homework): 10 (1.2 credits)
Conclusions

- The approach was used for CS students at PUB
- Algernon is not reliable – in future JESS
- A lot of psychology work to be done
- Difficult to develop the ontology