A Multimodal Participatory Tutoring System for the Rural Children

An Intelligent Tutoring System Authoring Tool
Introduction

- Many children in rural areas either do not attend schools or dropout at a very early stage.

  Reasons:
  - Paucity of good teachers
  - Monotonous learning process and study materials
  - No attention to individual needs of the students.

- Aim of this project:
  - Build a tutoring system that will provide a solution to the above problems
Objectives

- Provide an interactive environment for the children to access the educational material at their own pace
- A platform to teachers to make teaching more effective and interesting.
- Facility to present the same courseware in different forms and delivery paths
- Have adaptability on assessment of the student’s status
Objectives

- Develop a repository of course ware from different sources in different languages
  - Create a platform for sharing the course ware.
  - Facility for different courseware, built elsewhere, to be integrated with the system

- To deploy the systems at pilot sites for field testing and system refinement through user feedback
System Description

- Architecture
- Domain Model
- Student Model
- Control Engine
The Architecture

ASM: Authoring student model, AR: authoring repository, ACSS: Authoring concept state space, CS: Content Structure, CDG: concept dependency graph
The Architecture

Teacher's GUI

- ASM
- AR
- ACSS

Coursewares

Repository

Testwares

Control Engine

Student Model

Student's GUI

PI

TI

Interfaces

Controller

Domain Organization
Module

Student
The Architecture

Teacher

Teacher's GUI
- ASM
- AR
- ACSS

Domain Organization Module
- CS
- CDG

Testwares
Coursewares
Repository

Control Engine

Student Model

Student GUI
- PI
- TI

Student

Domain Model
The Architecture
The Architecture

Teacher's GUI
  - ASM
  - AR
  - ACSS

Repository
  - Test wares
  - Course wares

Control Engine

Student Model

Student's GUI
  - PI
  - TI

Student Model

Student
Domain Model

- The domain model contains all the information about the courses, their topics, study materials etc.

- This module has two major parts,
  - First is the Domain Organization Module (DOM) and the
  - Repository
Domain Model

- Domain Organization Module
  - This module is the knowledge base of the system
  - Here the structure of the courses are organized using two structures
    - Content Tree (CT)
    - Topic Dependency Graph (TDG)
The Content Tree keeps all the sections, topics, concepts of a course in a tree like structure.

- Name of the course is kept at the root.
- Subsequently the sections, topics are kept in the lower parts of the tree.
- An edge in the tree depicts a part-of relationship.
The information kept for each topic,
- Hardness (difficulty level of the topic)
- Importance (how important this topic is w.r.t the course)
- Prerequisites (the topics which need to be covered before this one)

List of concepts (all the concepts which are important and a part of this topic)
The topics and their prerequisite relationship are kept in the Topic Dependency Graph.

In this graph the nodes are the topics from the corresponding CT.

The edges depict prerequisite relationship between these topics.
There can be numerous paths (teaching plan) in this graph from the starting topic to the terminating one.

The task of the teaching module is to find the most optimal path for a particular student.
The repository is a collection of study and test materials.

Existing documents can be downloaded and plugged into the repository.

The documents in the repository are annotated with proper tags for efficient retrieval.

The repository is a shared pool of contents, where anybody can contribute from anywhere.