

Title: DeepTutor Mobile

Customer: Prof Vasile Rus

Summary:

DeepTutor is an advanced intelligent tutoring system that fosters students' deep understanding of complex science topics through quality *interaction* and *instruction*.

Quality interaction means the student and tutor understand each other at every turn and over many dialogue turns. Quality interaction is possible in DeepTutor through the use of a novel, state-of-the-art natural language-based knowledge representation and advanced dialogue management techniques that embed novel conversational goals such as perfect grounding at every turn.

Quality instruction in DeepTutor is assured by the use of Learning Progressions (LPs), a recently developed framework by the science education research community to describe students' natural paths to mastery. LPs capture the natural sequence of mental models and mental model shifts students go through while mastering a topic. DeepTutor uses LPs to model the task domain, track students' knowledge states, and provide appropriate feedback. Fully adaptive tutoring is desirable because it maximizes tutees learning through strategies customized to each individual student.

The goal of this project is to implement a *mobile DeepTutor application*—in particular, targeting smartphone devices (e.g., iPhones). DeepTutor's core functionality is currently implemented as a web service, which the mobile app will use. Thus, the main tasks in the project will involve the following:

- designing a user interface for mobile devices,
- developing the mobile app, and
- implementing the logic for interacting with the DeepTutor service.

Key Features/Concerns:

- DeepTutor application for mobile devices. The application presents users with a variety of tasks, and the user interacts with DeepTutor as he/she works on the tasks.
- Usability on small displays is a key concern. Although portability is generally desired, having an app for the iPad is the top priority (and having one for the iPhone is the second highest priority).

Additional Comments:

- See the DeepTutor homepage: <http://www.deeptutor.org/>.
- A prototype web app already exists, but it is ill-designed for mobile devices. See screenshots of the web app below.

DeepTutor

deepptutor.org/demo

Enable Agent to Speak

Reset My Session

Move To Next Task

DeepTutor

Dialogue History

sences.

HINT 2: For each problem, a complete answer would include 3 parts: 1) the result or conclusion, 2) a principle or definition which justifies or explains the result, and 3) an explanation of how the principle or definition applies to the particular objects, interactions, and events described in the problem.

Now, go ahead and press the Continue button in the Student Response box below.

We will work now on a task, shown in the Current Task box in the top right corner, that will improve your knowledge about forces acting on objects moving constant velocity over a rough surface.

Read the problem first and then provide a detailed solution for it as instructed.

YOU: The man pushes the box.
TUTOR: Bravo! The floor exerts a horizontal force due to _____ on the box, in the opposite direction to the mover's push.


YOU: Gravity causes the horizontal force.
TUTOR: The floor exerts a horizontal force due to friction on the box.

The Earth exerts a downward force due to _____ on the box.


Current Task

A mover pushes a box horizontally so that it slides straight across the rough floor at a constant speed. Describe the forces that are acting on the box and indicate which forces balance.

Please begin by briefly answering the above question. After briefly answering the above question, please go on to explain your answer in as much detail as you can.



Multimedia



Student Response

Gravity causes the downward force|

Submit

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Figure 1. Screenshot of the existing DeepTutor web app.