STRP II - Designing an Adaptive Learning Algorithm for Standardized Test Preparation

Meeting Minutes

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Supervisor: Dr.Waqar Saleem

Contents

1 Week 1

1.1 Meeting #1: June 8

Type of Meeting:
Group

Names of Meeting Attendees:
Muneeb Shafique
Anosha Fazli

Meeting Agenda:

- Project Overview
  - Provide a detailed overview of the research project, including its objectives, scope, and significance.
  - Highlight preliminary work done (literature review) & ideas developed.
- Discuss deliverables of the research project.
- Determine the frequency of progress updates that our supervisor prefers.
- Present and review the proposed timeline for the research project, including major milestones and deadlines.
- Ensure the supervisor shares the same understanding of what needs to be achieved as us.

Points Discussed:

1. Tasks required to complete research in 10 weeks.
2. Sequence of tasks to be carried out
3. Dependency of Tasks
4. Project Deliverables
5. Motivation behind choosing the specific problem.

Feedback from Supervisor:

- Interesting Problem.
- Seems doable.

Action Items:

1. Continue with literature Review: Look into techniques used to develop existing adaptive learning systems
2. Begin finding and tagging questions.

2 Week 2

2.1 Meeting #2: June 14

Type of Meeting:
Group

Names of Meeting Attendees:
Muneeb Shafique
Anosha Fazli

Meeting Agenda:

- Discuss approaches found by reading the literature.
  - Components required for an ITS
  - Approaches for the Pedagogical and Student Model
- Number of questions for every topic
- Should we finalize the approach for every module or begin coding one module at a time?

Points Discussed:

1. Representation of Knowledge Base.
2. Integrating Database.
3. Integrating the effect of guessing, missed questions.
4. Approaches used for the pedagogical module
5. Different components of the ITS (intelligent tutoring system)
6. Number of questions for each difficulty level in every topic.

Feedback from Supervisor:

- Work on Pictorial representation of step required to solve the problem
- Structure of presentation (improve)

Action Items:

1. Develop forest (Topic Map)
2. Decide & setup Database.
3. Finalize approach used in the Pedagogical module.

3 Week 3

3.1 Meeting #3: June 20

Type of Meeting:
Group

Names of Meeting Attendees:
Muneeb Shafique
Anosha Fazli

Meeting Agenda:

- Discuss approaches found by reading the literature.
  - Approaches for the Pedagogical Module which focuses on how the paper in each iteration will be generated.
  - Approaches for the Student Model which is supposed to keep track of individual student's weaknesses and strengths track.
- Receive feedback on the completed knowledge base.
- Discuss some other factors like guessing, skipping involved in developing an adaptive learning system.
- Receive feedback on Task dependency graph
- Receive feedback on Framework chart.

Points Discussed:

1. Knowledge Base (limiting to 1 sub-topic for every Topic)
2. Different approaches we found through literature review that can be used for the pedagogical module.
3. Different approaches we found through literature review that can be used for the Student model.
4. Factors involved in developing an adaptive learning system. (skipping, guessing, time-taken on each question)

Feedback from Supervisor:

- Progress is satisfactory (on track)

Action Items:

1. Begin coding the Paper Generation Module.
2. Adjust framework diagram
3. Look into CATsim (a python library).

4 Week 4

4.1 Meeting #4: June 27

Type of Meeting:
Group

Names of Meeting Attendees:
Muneeb Shafique
Anosha Fazli

Meeting Agenda:

- Receive feedback on the paper generation module.
- Receive feedback on updated framework chart.
- Receive feedback on updated Database.

Points Discussed:

1. Add another layer to Database(should hold information on more than one subject).
2. Working of Paper Generation Module

Feedback from Supervisor:

- Progress is satisfactory (on track)

Action Items:

1. Updating Student Model based on responses.
2. Build evaluation model.
3. check for student work in the model to see proficiency in the table of sections,topics and work model.
4. also look into CATsim – library item response theory + look into obstacles

5 Week 5

5.1 Meeting #5: July 4th

Type of Meeting:
Group

Names of Meeting Attendees:
Muneeb Shafique
Anosha Fazli
Laiba Qureshi

Meeting Agenda:

- Discuss approaches to update student model using student responses
  - Bayesian knowledge tracing
  - Performance Factor Analysis
  - Deep knowledge tracing
  - Threshold method
  - ELO rating system
  - Q-Matrix method
- Receive feedback on updated framework chart.
- Discuss student simulation to test model.

Points Discussed:

1. Approaches to update student model using student responses.
   - Threshold method
   - ELO rating system
   - Q-Matrix method
2. Student simulation to test model

Feedback from Supervisor:

- Progress is satisfactory (on track)

Action Items:

1. Implement the Student Model using at least 1 of the abovementioned approaches.
2. Visualization of Model (generated papers, responses, topic proficiency) after each iteration.
3. Simulation of student.

6 Week 6

6.1 Meeting #6: July 14th

Type of Meeting:
Group

Names of Meeting Attendees:
Muneeb Shafique
Anosha Fazli
Laiba Qureshi

Meeting Agenda:

- Receive feedback on implemented approaches to update student model using student responses
  - ELO rating system
  - Q-Matrix method
- Receive feedback on the updated framework chart.(included CATsim diagram)

Points Discussed:

1. Approaches to update student model using student responses.
   - ELO rating system
   - Q-Matrix method
2. Student simulation to test model

Feedback from Supervisor:

- Progress is satisfactory (on track)

Action Items:

1. Implement CATsim.
2. Visualization of Model (generated papers, responses, topic proficiency) after each iteration.
3. Simulation of students.

7 Week 7

7.1 Meeting #7: July 20th

Type of Meeting:
Group

Names of Meeting Attendees:
Muneeb Shafique
Anosha Fazli
Laiba Qureshi

Meeting Agenda: ‘

- Discuss implementation of CATsim
- Discuss simulated students.
- Discuss visualization of the Model (generated papers, responses, topic proficiency) after each iteration.

Points Discussed:

1. Overview of the implementation of CATsim
2. Student simulation to test model
3. Alternate concise visualization to validate correctness of model.
4. Final deliverables of the research project.

Feedback from Supervisor:

- Progress is satisfactory (on track)

Action Items:

1. Integrate CATsim with an existing model.
2. Fix minor issues with Database.