Spoken Dialogue System based on “Who Wants To Be A Millionaire”

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INTRODUCTION

Objective:

To develop and evaluate a spoken dialogue system on the lines of the popular game show “Who wants to be a Millionaire” using an existing speech recognition system and a text-to-speech synthesizer.
OBJECTIVE

- To develop a spoken dialogue system for the Millionaire game such that the user gets an experience as realistic as one sees on TV.

- To develop an interactive game which integrates existing speech recognition and manipulation capabilities.

- To evaluate the efficiency of the system and its components.
HOW DOES IT WORK?

- Speech recognition: CMU Sphinx4
- Text-to-Speech synthesizer: FreeTTS

- The “host” presents and reads out a question and its answer options to the “player”. The “player” responds with an answer that the host must comprehend and carry the game forward accordingly.

- Based on the rules of the Millionaire game.
Read the paper “CMU’s robust spoken language understanding system” – Sunil Issar and Wayne Ward.

Does not pertain to a single topic; it is a mixture of what I have learnt throughout the course.

Wanted to explore speech recognition and synthesis systems, and how they could be deployed into an actual dialogue system.

This project integrates 3 important components of a dialogue system – speech recognition, NLU and TTS – into an exciting, interactive game.
CHALLENGES

- Understanding the JSGF (Java Speech Grammar Format).
- Writing the appropriate grammar covering all possible user speech inputs.
- Developing a multithreaded java game.
- Integrating speech recognizer and TTS into the game.
TIME FOR THE DEMO.
EVALUATION PLAN

Using the power of java to evaluate the following results:

- The number of times the system wrongly recognized user answer.
- Number of turns taken to confirm user input.
- Chance behavior: If the output was correct even though input recognition was wrong? The system proceeds only after it has confirmed the user’s answer.
- Generate a report providing statistics of accuracy and asks for user satisfaction rating once the user says “quit” or wins the game.
- The statistics can be used to edit the grammar file to incorporate more user input possibilities.
FUTURE WORK

- Incorporate the millionaire game music.
- Implement lifelines.
- Write comprehensive grammar.
- Develop a question bank in the proper format, readable by the java program.
- Handle errors (what if user presses mouse button while the system is reading the question?)
OPEN QUESTIONS

- Can I incorporate actual human speech for the TTS module (for the host to read out the questions)?

- Introducing a virtual human as the “host” instead of just a voice?