Natural Language Inference system for Computer games

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Outline

1 Abstract

2 Introduction

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- To develop a new way of voice interaction with natural language as interface for startegy based computer games
- To allow a Game player to control all the NPC(non-playing characters) in the game
- To enable the Game player make strategic decisions based on perceptions recieved from all the NPC(non-playing characters)
- To build a game to achieve DDM(Dynamic decision making)
- To increase the number of degrees of freedom in gaming environment and to make rich human computer interaction

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Introduction

- Computer games are a major recreational activity .The challenge of interaction with the computer games is to transform it more engaging.
- Here, the interaction with the computer game will be via speech recognition . The recognised speech will be processed with state of art NLP techniques to infer . The inference is used to decide the next action.The user can communicate with NPC using his natural language .
- eg :
  player:"HEY STEP OUTSIDE , WE HAVE AN INCOMING . COPY THAT"
  NPC: "I CANT , I SUSPECT THERE IS A MINE FIELD IN FRONT OF ME.COPY THAT"
  player:"GOT IT " .
  (this updates the knowledge base of characters i.e an update to their map , marking that place as danger)

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Traditional game

(Loading video...)

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Keyboard and gesture based interaction

- A computer game is played by pressing or holding the key or combination of keys for a while. This key pressing events are transformed into actions on the computer game. Gesture based interaction , recognises the users gestures via a web-cam or trackpad or any other sensory devices. The gesture based recognition is then transformed into suitable actions on the game .

Keyboard and gesture based interaction

Limitations

- A single player cannot control the whole team . The non playing characters are pre determined.
- The user has to remember complete keycombinations or gestures and need to choose what to do when ? .
- The key combinations vary for different platforms .
- A single key combination or gesture cannot perform a complex action in the game .
- Cannot produce illusion of intelligence in the behaviour of non-player characters .

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Automatic Speech recognition systems

- Voice driven commands can be used to control the game . The ASR works by converting speech to text and then matching the text against suitable actions .

Automatic Speech recognition systems

Limitations

- Speech recognition systems however, do not support emotions , attitudes, tones etc.
- Allows only restricted input .
- User needs to remember all the key words .
- Disruptions in input due to factors like accent/poor performance in input device(mic) .
- User cannot give multiple constraints to a NPC .

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Solutions to existing problems

- The game player should play the without any prior knowledge of key-combinations or gestures .
- The game player should have control or communication with multiple NPC's .
- Achieving complex actions must be feasible .
- Recognised speech must be transformed into actions via inferences and not just by a mapping between text and actions .

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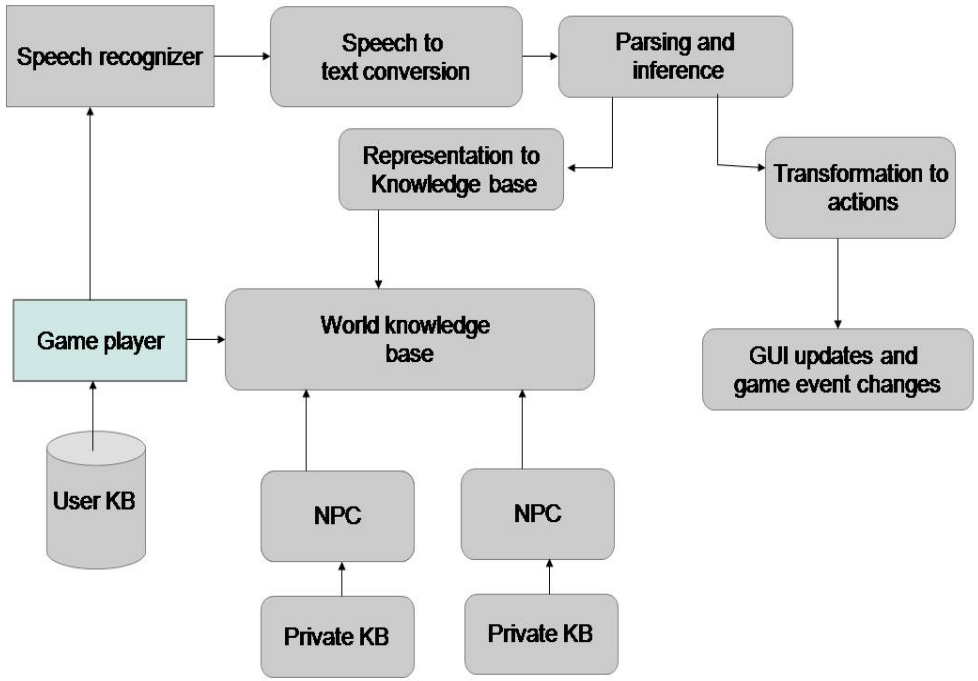
Proposed Work

- The player will interact with the game through voice interaction . This speech is in turn converted to sequence of sentences . These sentences are inferred with a state of art nlp techniques for inference and converted into a suitable action .The inference may perform multiple actions from single speech .

Proposed Architecture



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"If some problem has complex solution , then it must be possible, if a solution is possible then make it simple"

Apple