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Word game Ghost for the robot Pepper

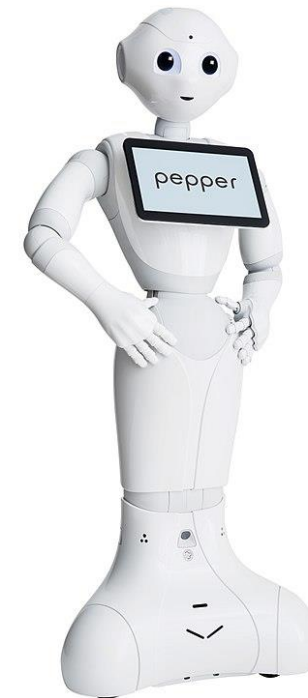
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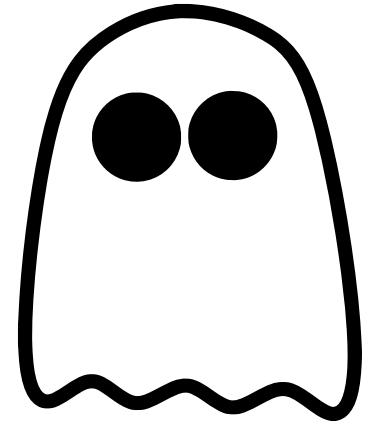
Robot Pepper

- Social humanoid robot by softbank robotics
- Provides preception modules for communication with surroundings (including 2D/3D cameras, touch sensors, speech recognition)
- Operates on open and fully programmable platform



Ghost

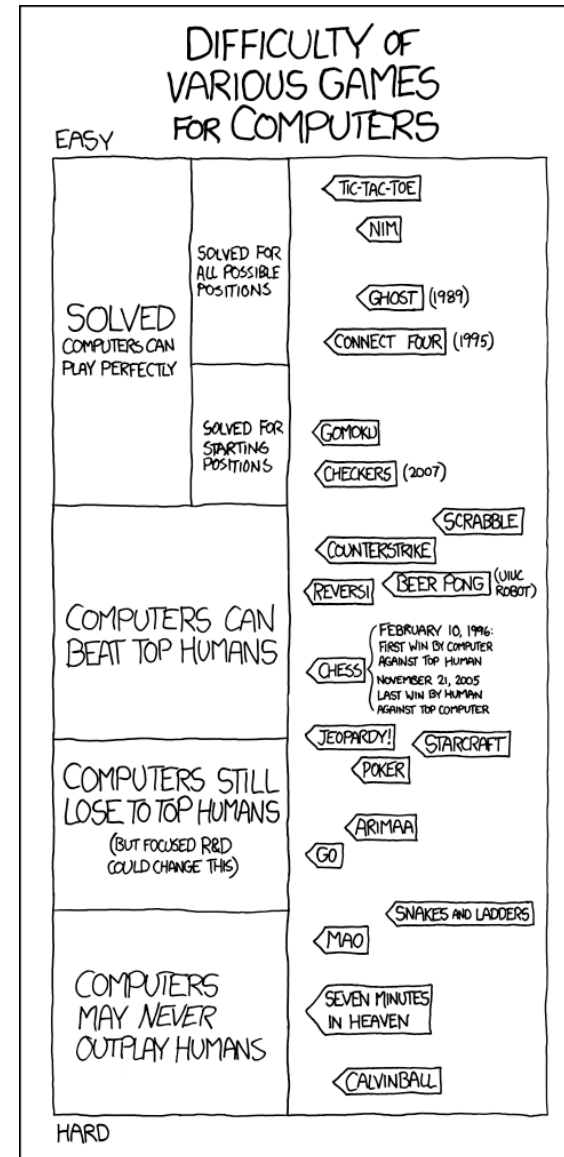
- Ghost is a word game for two or more players
- Each player begins with agreed number of lives (usually 5)
- Players take turn to add a letter to an existing word fragment avoiding creating a valid word
- Player loses a life if he is unable to add a letter, adds a letter which leads to non existent word or creates a valid word by adding a letter



- Players with zero life are Ghosts, and cannot participate any longer. The last player with any lives wins the game.
- Player may instead of choosing a letter challenge pick of the previous player. If the challenged player cannot produce such a word, he loses a life. Otherwise the challenging player loses a life.
- Challenging a choice ends a round and the new word is started.



- If the whole vocabulary is known, it is a game with perfect information
- With different vocabularies exist different perfect strategies
- (For example one by [Randall Munroe](#))

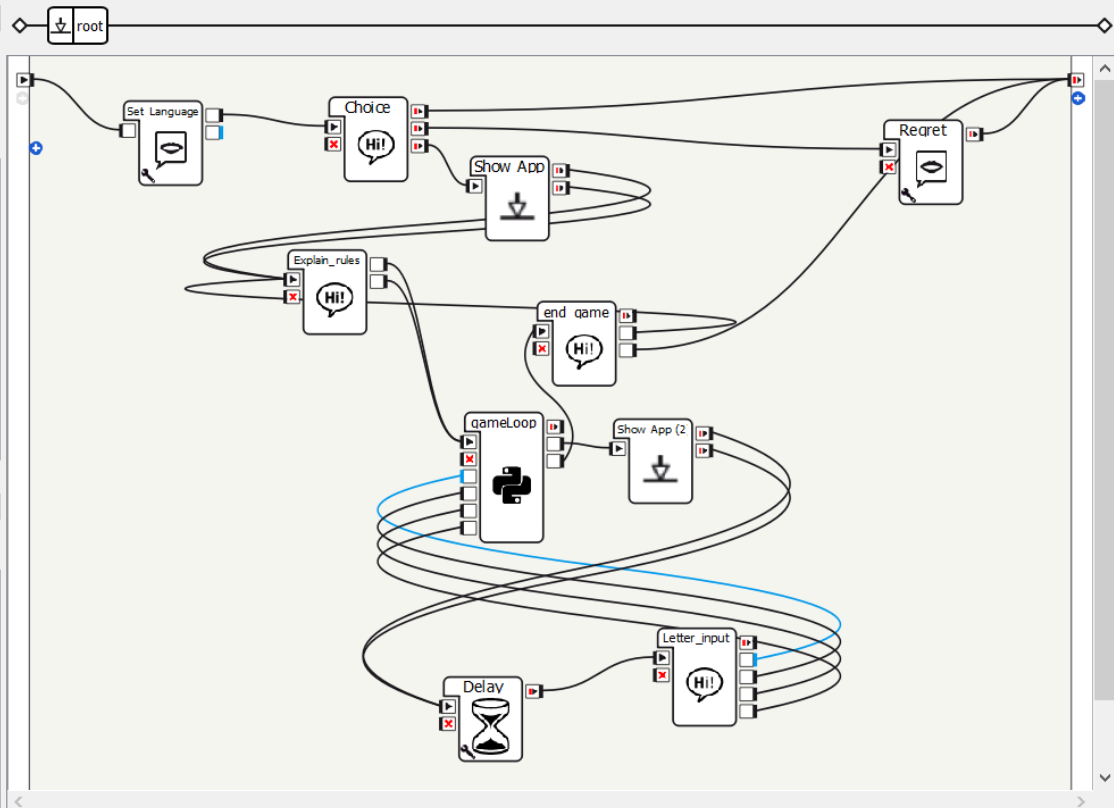


<https://xkcd.com/1002/>

Choregraphe

- Multi platform desktop application from Softbank Robotics
- Tool for creating animations, behaviour and dialogs for Pepper
- Test this solutions on simulated robots (more or less)
- User friendly drag and drop interface but supports python code





- All the boxes are running at the same time, waiting for the impulse to begin certain behaviour (sometimes hard to debug)
- Provides easy to use tools for TTS and speech input

```
class MyClass(GeneratedClass):  
  
    def __init__(self):  
        """  
        This part initialises main game loop, live counter and vocab for robot. Vocab is loaded from original_word_list.txt.  
        """  
        GeneratedClass.__init__(self)  
        self.tts = ALProxy('ALTextToSpeech')  
  
    def debug_say(self, word):  
        self.tts.say(word)
```

Text to speech usage example

Implementation

- Available at : https://gitlab.fi.muni.cz/xgazda/pepper_ghost_game
- Combination of python script and build in box libraries
- Only Human versus Pepper version
- Pepper searches through his available words from his inner dictionary, plays random letter which doesn't make him lose immediately
- Pepper uses same vocabulary for checking for word validity and his own turn
 - Proves hard to beat

Transcript of the game with one life

Robot: Chceš si zahrát hru Duch?

Human: ano (100%)

Robot: Mám ti vysvětlit pravidlá hry?

Human: ne (100%)

Robot: Ok, můžeme začít.

Human: t (100%)

Robot: r

Robot: Tvůj tah!

Human: p (100%)

Robot: e

Robot: Tvůj tah!

Human: l (100%)

Robot: i

Robot: Tvůj tah!

Human: v (100%)

Robot: e

Robot: Tvůj tah!

Human: h (100%)

Robot: o

Robot: Prohrál sem!

Robot: Nemám žádné životy! Prohrál jsem.

Robot: Chceš si ještě zahrát?

Human: ne (100%)

Robot: Tak nic. Nashledanou.

Tablet Interface

- Robot provides a tablet which can show webpages
- Script creates a simple webpage with current game state (simple HTML + CSS)
- Choregraphe cannot simulate tablet (cannot check actual results)



Possible Improvements

- Modifying game so that it can be played by more players
- Restrict robots vocabulary, It is not enjoyable to always lose
- Better design of internal webpage
- Robot takes too long to sort through frequent prefixes

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Thank you for your attention

Sources

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