

Automated Commentaries for Simulated Soccer

Commentary Output to Audience

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1. Commentary Output

The user can set whether the commentary should be outputted as text, voice or both by setting the variable passed to the Output.java constructor. See documentation for more information.

The Output class implements all the methods of output used by the system. This class receives the next sentence to be conveyed to the audience and identifies the user variables to how that information will be outputted.

All comments passed to the Output class will eventually be outputted, with some possibilities of lag on some of the text-to-speech utterances.

1.1. Text

Textual outputs will be displayed within the main text area of the GUI. Textual display does not take into account different levels of excitement but does specify the type of the voice used, Commentator or Stats.

As soon as a commentary sentence is received from the Commentary Producer, it is immediately outputted as text and if applicable passed for vocal output.

1.2. Voice

If the user has asked for the commentary to also feature voice then an OutputVocal object is created which will handle all Text-to-Speech output of the system. Output object governs all scheduling towards the vocal output.

OutputVocal defines all the necessary implementation of the Free-TTS packages that we have decided to use for its availability and the fact that it was implemented in Java which enabled a consistent integration with out existing code. At first I implemented Free-TTS with the kevin16 voice which is the default voice provided with the package.

The OutputVocal object overrides the Thread class to enable concurrent running with the rest of the system. The object sleeps until a new comment is passed to Output where it calls notify to wake the OutputVocal to apply all preparations before speaking that sentence. Each comment has separate excitement levels, as defined within the OutputVocal constants. When OutputVocal receives its new sentence it applies a series of modification to the current voice in use, this includes pitch, words per minute, volume modifications to bring an extra dimension into the level of excitement of the voice during a certain phase of play (this is done within the allocateVoiceParam(..) method). The sentence is then passed to the FreeTTS engine where the words are read out to the audience. The voice parameters are then reset to their original values ready for the next sentence.

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Time of utterance was crucially kept in mind to insure that lag was kept to a minimum between visual events and output. Most sentences take around 2-3 seconds from the call to the end of the sentence output which is relatively good to avoid any lag.

We realised the need for further voices to possibly implement a further commentator to be used for stats purposes therefore further research was done to identify ways to introduce a new voice without the need to refactor too much of the existing code. Mbrola is a plug-in for FreeTTS which enabled me to add 2 new voices to the system. I replaced the existing kevin16 voice with mbrola_3 an American, more humanly voice and introduce a female voice for the stats so that both voices can easily be differentiated from one another. The choice of voice can be set at the top level constants `MAIN_VOICE_TYPE` and `STATS_VOICE_TYPE`.

As discussed earlier, all scheduling of the voice is handled by the Output object. If commentary strings arrive too fast to the Output object then it is likely that the voice will not cope and commentaries are simply overwritten as the voice cannot be stopped during live utterance. If the OutputVocal remains without a comment then the Output class will notify the OutputVocal when the next comment is available to be spoken. Each comment is passed using a setter method within OutputVocal and is then stored locally within that object (as is the next excitement parameter to be utilised).

Voices currently supported by the system (these can be set as `MAIN_VOICE_TYPE` or `STATS_VOICE_TYPE`):

FreeTTS default voices:

- a low quality, unlimited domain, 8kHz diphone voice, called kevin
- a medium quality, unlimited domain, 16kHz diphone voice, called kevin16
- a high quality, limited domain, 16kHz cluster unit voice, called alan

Mbrola voices:

Name: mbrola_us1 **Current stats voice**

Description: MBROLA Voice us1

Organization: mbrola

Domain: general

Locale: en_US

Style: standard

Gender: FEMALE

Age: YOUNGER_ADULT

Pitch: 180.0

Pitch Range: 22.0

Pitch Shift: 1.0

Rate: 150.0

Volume: 1.0

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Name: mbrola_us2
Description: MBROLA Voice us2
Organization: mbrola
Domain: general
Locale: en_US
Style: standard
Gender: MALE
Age: YOUNGER_ADULT
Pitch: 115.0
Pitch Range: 12.0
Pitch Shift: 1.0
Rate: 150.0
Volume: 1.0

Name: mbrola_us3 **Current main commentary voice**
Description: MBROLA Voice us3
Organization: mbrola
Domain: general
Locale: en_US
Style: standard
Gender: MALE
Age: YOUNGER_ADULT
Pitch: 125.0
Pitch Range: 12.0
Pitch Shift: 1.0
Rate: 150.0
Volume: 1.0