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Music Informatics
Assessed Practical

In this practical you are asked to use and extend a small musical grammar, and to review a paper on the role of probabilistic grammars in music. The review counts for 1/3 of the credit for this assignment.

Background

Grammar

The grammars are written using Prolog's built-in grammar formalism.

You should read appropriate background on this, if you don't know it already — there is no need to know about the language as a whole, however. The formalism allows Prolog procedures to be interleaved with the parsing process; it also allows generation of grammatical output.

See the on-line book on Prolog "Learn Prolog Now":

http://www.learnprolognow.org/

especially lectures 7 & 8. To change rhythmic aspects, it will help to look at the extra features that are possible with such grammars, described at the end of chapter 8.

Music

We are looking at simple melodies, using the abc notation. A quick glance at the web-site will give the basic idea.

http://abcnotation.com/

We will not use repetition symbols.

This notation has been used for fairly large collections of music melodies which fit more or less in the main western music framework. See

http://abcnotation.com/tunes#historical

for some examples.

The task

There is a small grammar with some examples that are parsed by the grammar on the course web page under practicals. These are folk music melodies as jigs which are common in Scottish and Irish music.

Using the Grammar

1. Give two other examples of melodies that are accepted by the grammar, and two that are not accepted. Say briefly where the parsing breaks down in the latter case, and why.

2. Extend the grammar to allow larger coverage. (You may also want to revise or drop some of the given grammar rules.)
   You might allow some (**not** all) of these:

   - more rhythmical variation,
   - more than one harmony per bar,
   - a broader notion of notes associated with a particular harmony
   - some additional harmonies.

   One way to go about this is to take another piece in a similar style, and see how the grammar can be enlarged to accommodate the new piece. Note that, as things are set up, this will only work if the other piece is in the same key.

   Give two examples of melodies accepted by the new grammar, but not the original grammar.

   You should also include in your submission a short discussion about your choice of extended grammar — why did you pick the extensions you did, and how good do you think it is as a characterisation of music in this style?

Probabilistic Grammars

Read the paper "Probabilistic Grammars for Music"[1] by Rens Bod, and summarise the claims in the paper. What do you see as the strengths and weaknesses of this approach, in the context of generating music in a given style using grammars? How useful could this be for a composer who wants to generate new music using such techniques?

Marking

- A submission which alters the initial grammar sensibly, shows some idea of how to extend grammar, and describes probabilistic grammar clearly will receive a pass mark (at least 50%).

- A submission which produces a new grammar accurately, gives examples, and thinks carefully about probabilistic grammars will get an A pass (at least 70%).

Deadline

Submission is due on

Thursday 17th March

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[1]on the course web page

Submission

You should submit your work using the submit system on DICE. Submissions should include the grammars you developed, the example melodies (eg as comments in the code), and your review of the article).

Put these in a directory, and submit as follows:

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submit mi 1 <yourdirectory>
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