Hacking music with Haskell

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Hacking music with Haskell

- Interactive programming
- Livecoding
- TOPLAP organisation
- Perl music demo

- Haskell98
- Domain Specific Languages
- Useful Haskell libraries
- Haskell music demo
- Summary
Interactive programming

- the writing of parts of a program while it is active
- source code is the main interface to the program
- no design cycle - test while implementing
Livecoding

- Interactive programming before an audience
- Form of improvisation, with text
TOPLAP

- The Organisation for the Proliferation of Live Algorithm Programming
- A hundred or so members
- Manifesto includes “show us your screens”
- http://toplap.org/
Perl demo

- please put pl.avi here – 20 second movie
Stupid diagram

- source code
  - live source edits
  - interpretation & reloading
  - Executing program
  - OSC messages
- synthesiser
- sound
- music
- Livecoder
Haskell98

- Pure functional programming language
- Loved by mathematicians
- Easy to define own syntax, so useful for making embedded Domain Specific Languages
Domain specific languages

• Language with syntax and/or semantics tailored for a particular problem domain ...

• ... for example, making music
OpenSoundControl

- Network protocol for music communications
- Similar to MIDI, but far more flexible
- Haskell library part of hsc by Rohan Drape
hs-plugins

- Haskell library for dynamically (re)loading code
- Allows interactive programming
My first music DSL

<<<+  add a pulse with given period
<<<-  remove a pulse with given period
<<<>< offset pulses
My music DSL

4 \text{ <<=+} 0
makes this pattern:
\begin{verbatim}
 x---x---x---x---x---x---x---x---
\end{verbatim}

3 \text{ <<=} (4 \text{ <<=+} 0)
makes this pattern:
\begin{verbatim}
 -----x-----x----------x-----x-------
\end{verbatim}
Haskell demo

- hs.avi goes here
- 60 seconds – worth 3 slides!
Future

- Extend language
  - more flexible timing
  - control over timbre
- Software actor
  - musical software that improvises live using this language (my MSc project)
Summary

- Music DSLs are great
- Haskell is great for music DSLs
- TOPLAP is good too - http://toplap.org
- My personal website is http://yaxu.org/
- Livecoding band I'm in is at http://slub.org/
- My academic website is http://doc.gold.ac.uk/~ma503am/
- My email is alex@slab.org
- Thanks!