Improvisation Education Support Software

Towards a Personal Improvisation Companion

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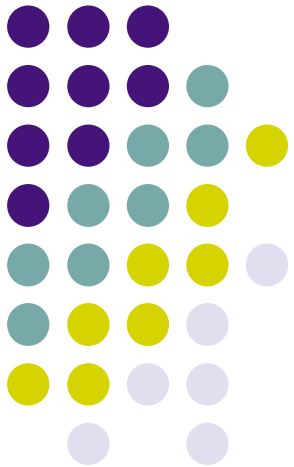
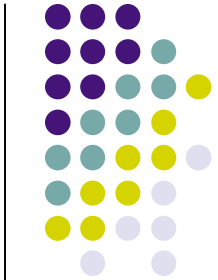


Leeds International Jazz Conference
Leeds, England
March 25-26, 2010

Acknowledgement: Contributors



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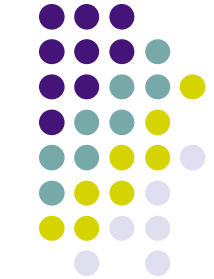
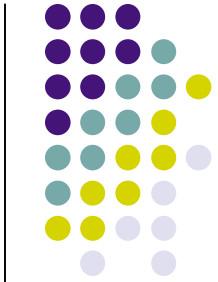
Structural Aspects of this Talk



- I will identify some *future* possibilities *along with* current features,

- rather than waiting until the end.

Software Tool for Jazz



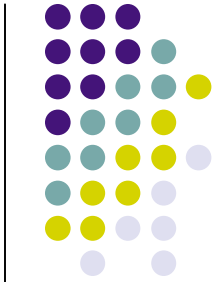
- Supports intellectualization, exploration
- Provides aural feedback
- Can act as a companion, e.g.
  - Play-along
  - Trading melodies

- Encourages thought about
  - Tune structure
  - Melodic ideas

Jazz is an Emotional *and* Intellectual Activity

- We are artists on the stand.
  - There we want to emote, not think.
- But we are analysts in the shed.
  - Plan.
  - Analyse.
  - Experiment.
  - Exchange ideas.
  - Then push everything to the subconscious level.

Improvisation Support Tool:

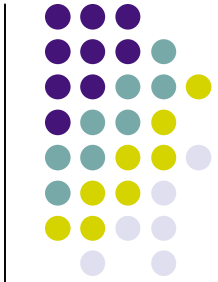


Background of Impro-Visor

- Began in mid-2005
- Improvisation Course Experience
  - Students compose solos as part of study and preparation
  - Desire legible and playable results
  - Advise the player, without a personal coach

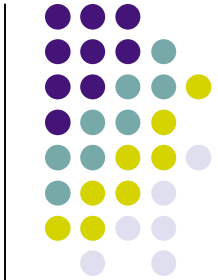
- Personal Improvisation Experience
  - Work out lines
  - Save for later reference
  - Transcribe the work of others

Composition vs. Transcription



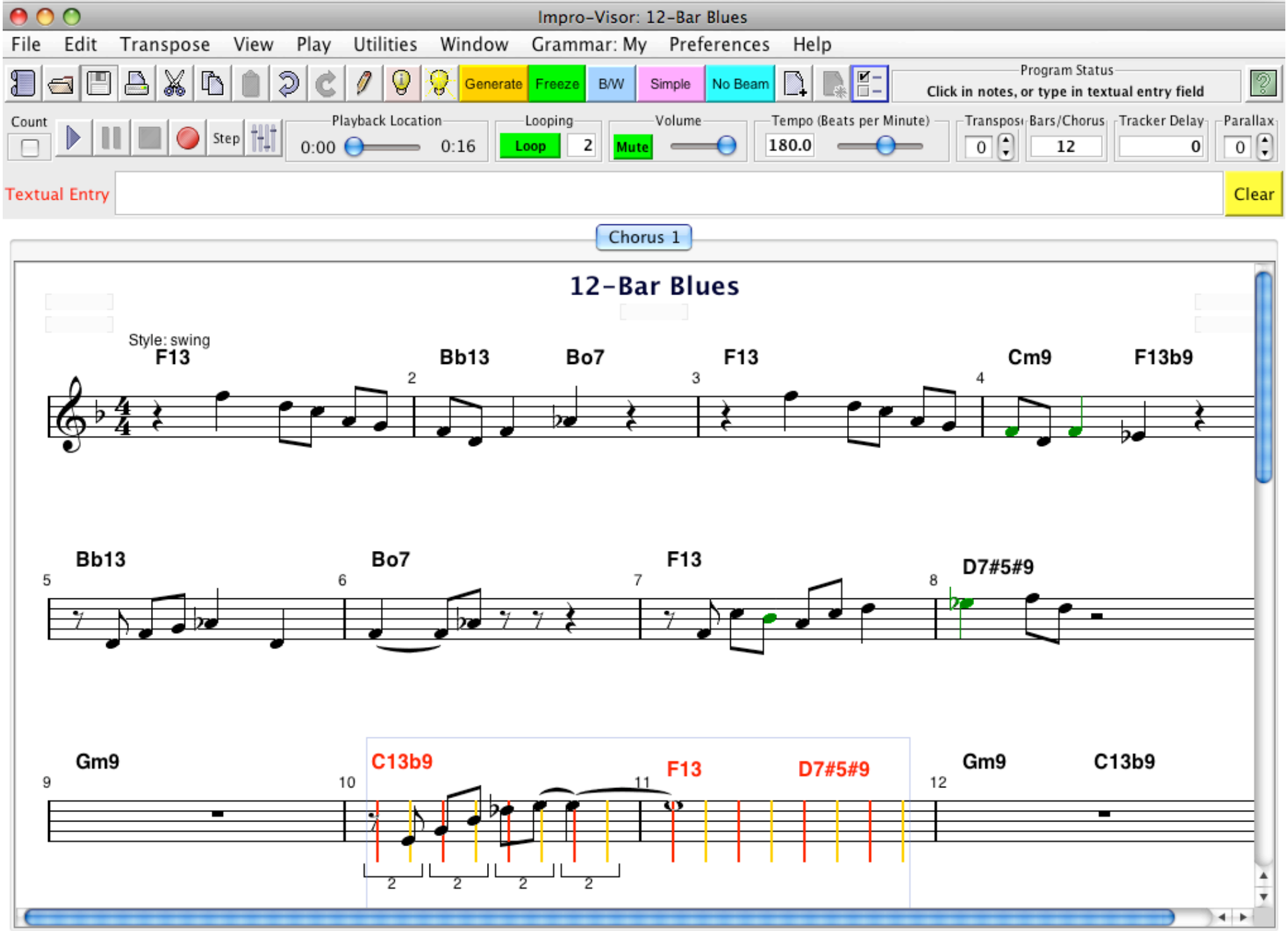
- Ownership of Results
- Pride of Ownership
- Enjoyment and Satisfaction

Impro-Visor



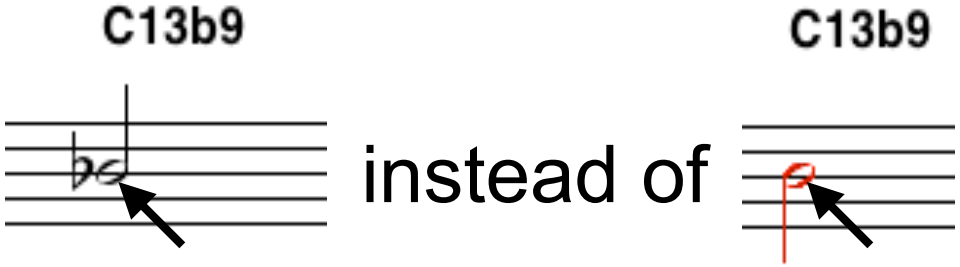
= “Improvisation Advisor”

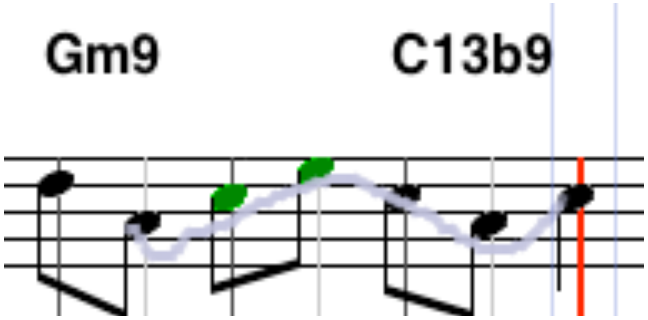
- Composition support tool
- User ideally should do most of the work
  - Assistance provided on music theory
    - Chord spellings
    - Scale choices
  - Archival aspect
    - Licks, Idioms, Cells, Quotes
- Detailed suggestions provided to user, *if needed*


Impro-Visor: 12-Bar Blues
File Edit Transpose View Play Utilities Window Grammar: My Preferences Help
Generate Freeze B/W Simple No Beam
Program Status
Click in notes, or type in textual entry field
Count
Step
Playback Location
0:00 0:16
Looping
Loop 2
Volume
Mute
Tempo (Beats per Minute)
180.0
Transpos
0
Bars/Chorus
12
Tracker Delay
0
Parallax
0
Textual Entry
Clear
Chorus 1
12-Bar Blues
Style: swing
F13 Bb13 Bo7 F13 Cm9 F13b9
Bb13 Bo7 F13 D7#5#9
Gm9 C13b9 F13 D7#5#9 Gm9 C13b9

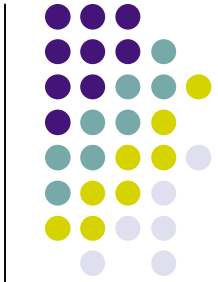
Note Entry Options

- Point & Click
- Textual: e8 g8 bb8 db+8 e+8+4+1
- MIDI keyboard (better developed in future)
- ***Harmonic*** Point & Click, or Sketch:
  Notes gravitate to
  chord/color tones





Future Work on Note Entry

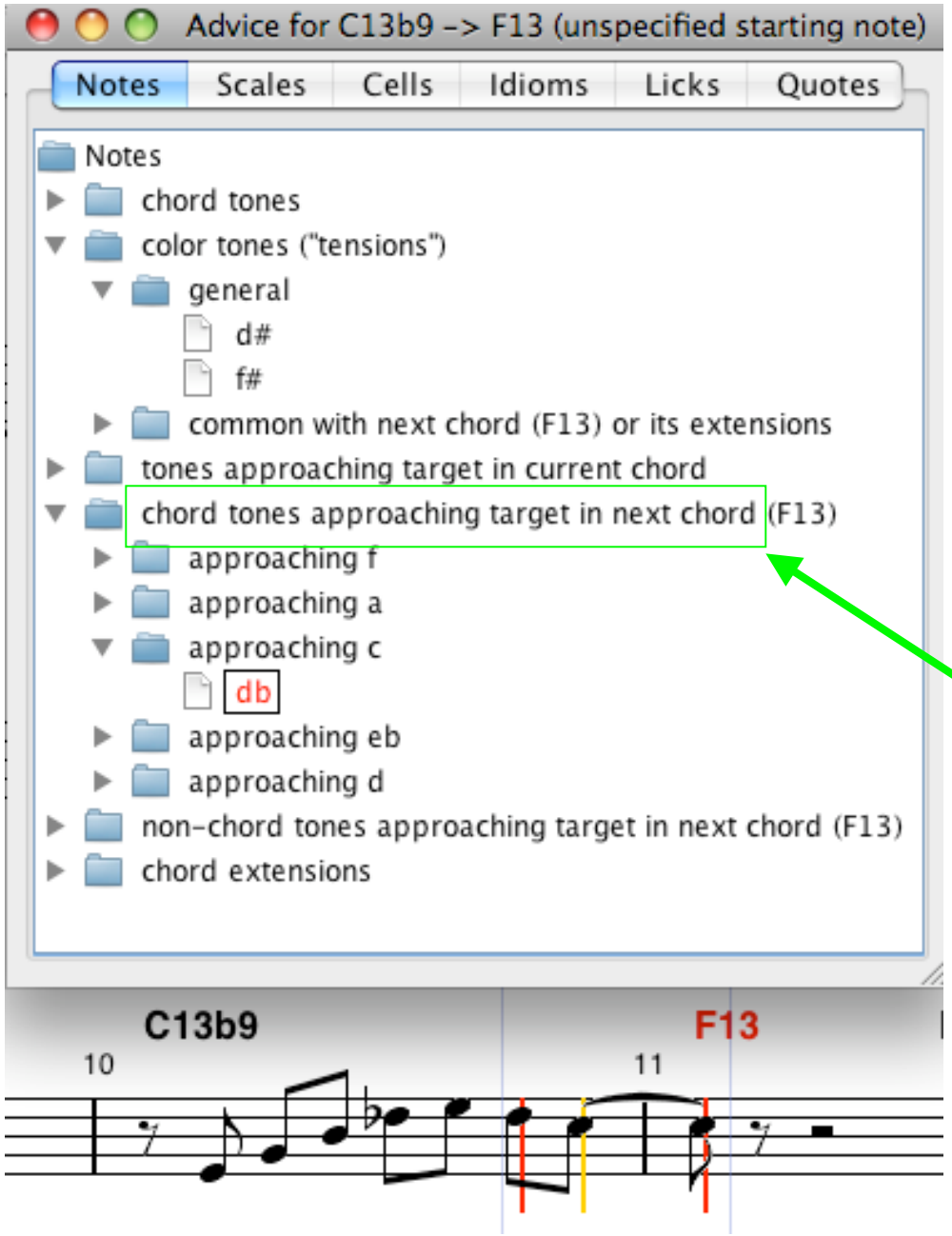


- Optionally indicate functions alongside the notes (e.g. #9).

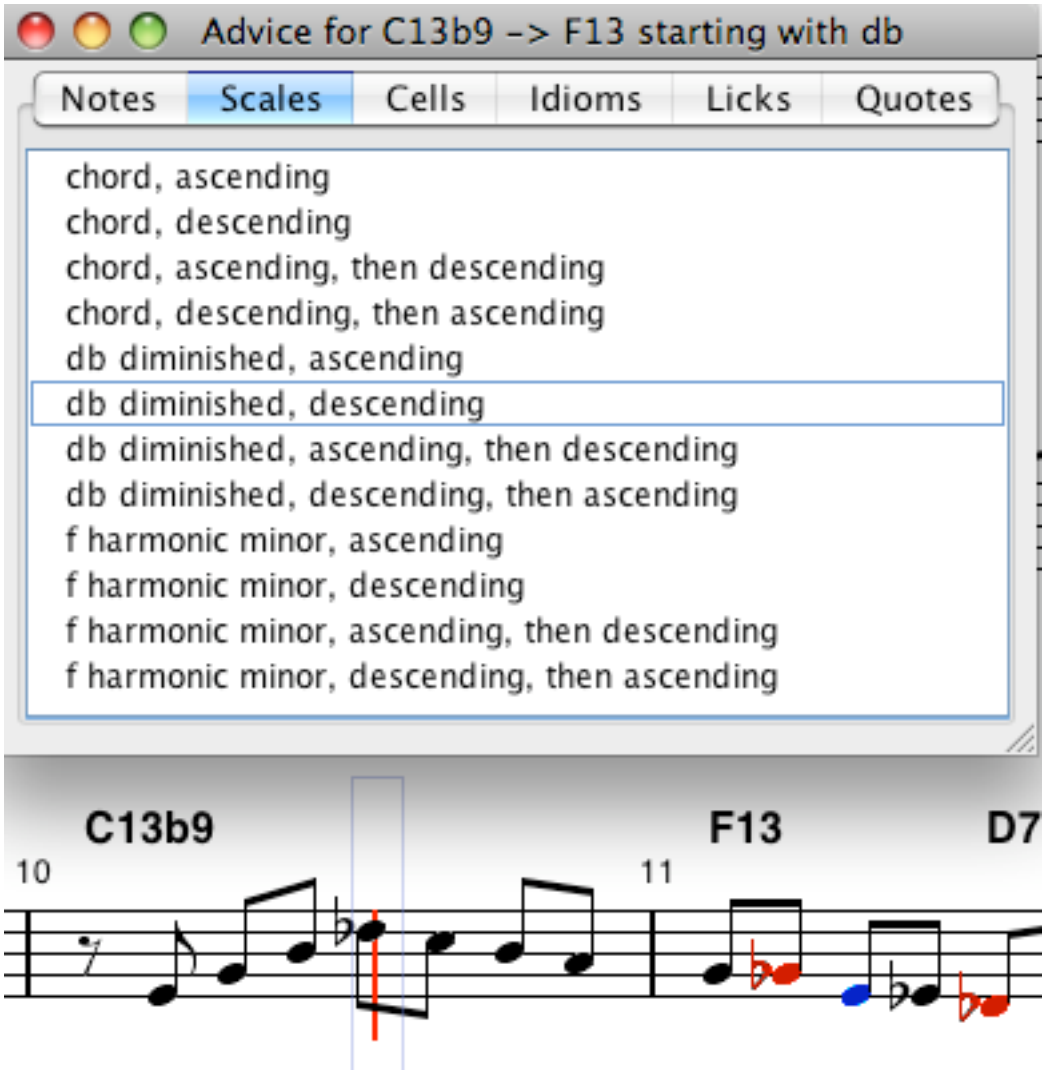
- Make the sketch aspect smoother and adjustable as a spline.

Micro-Advice on Theory:

Chord & Approach Tones

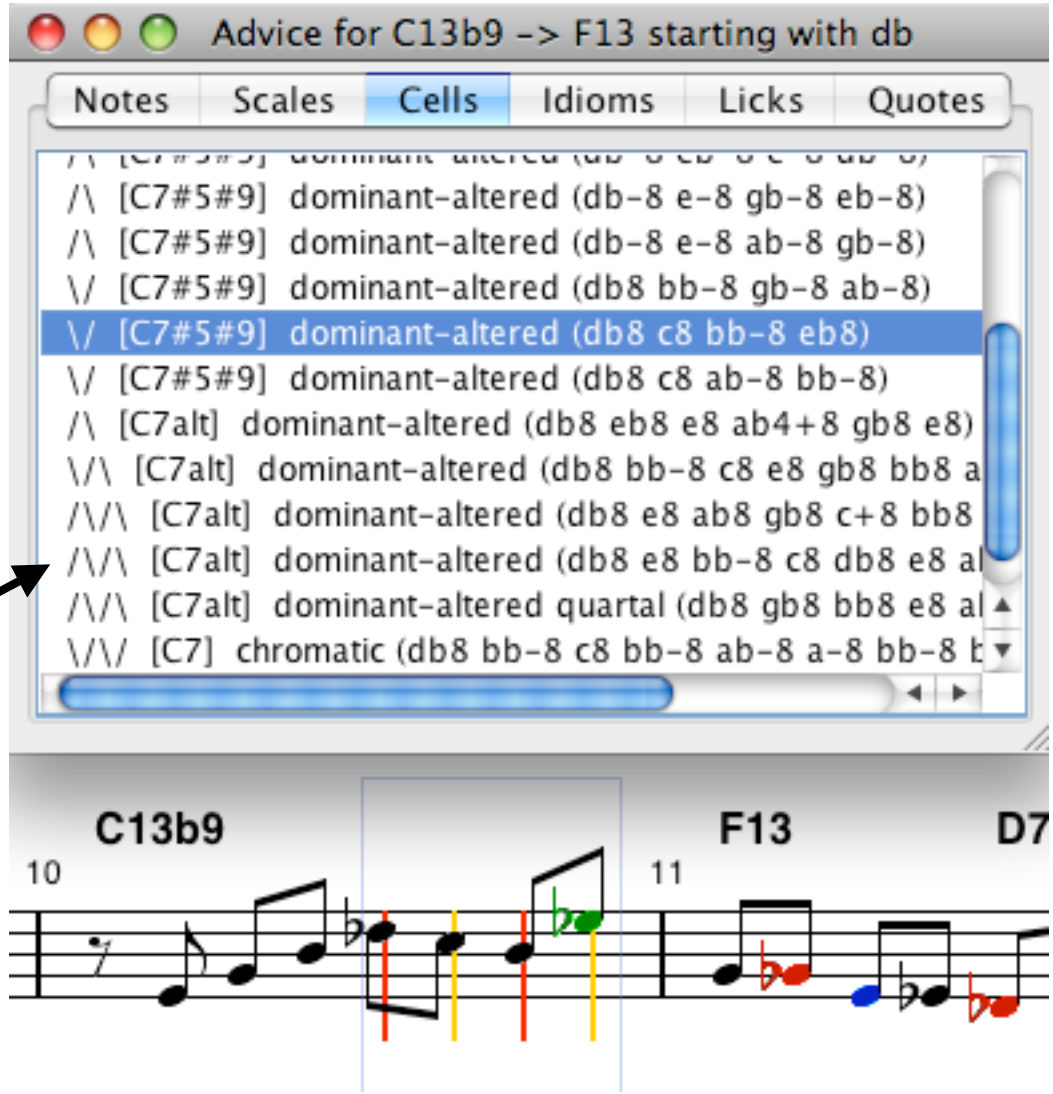


Scale Choice Advice



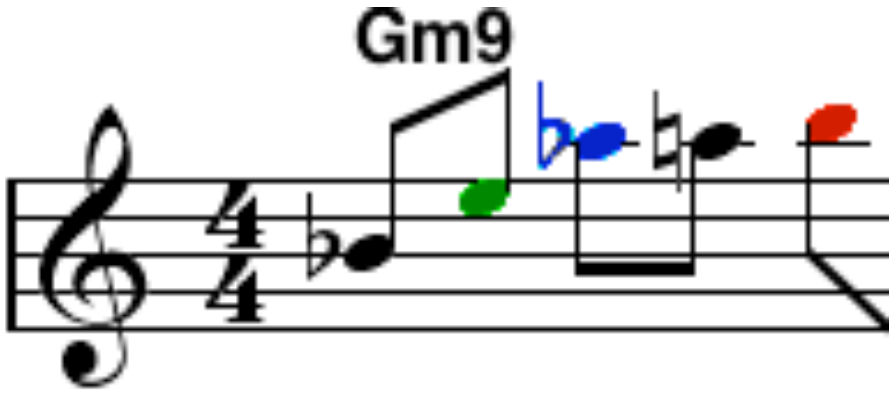
Melodic Cells

Contour profiles

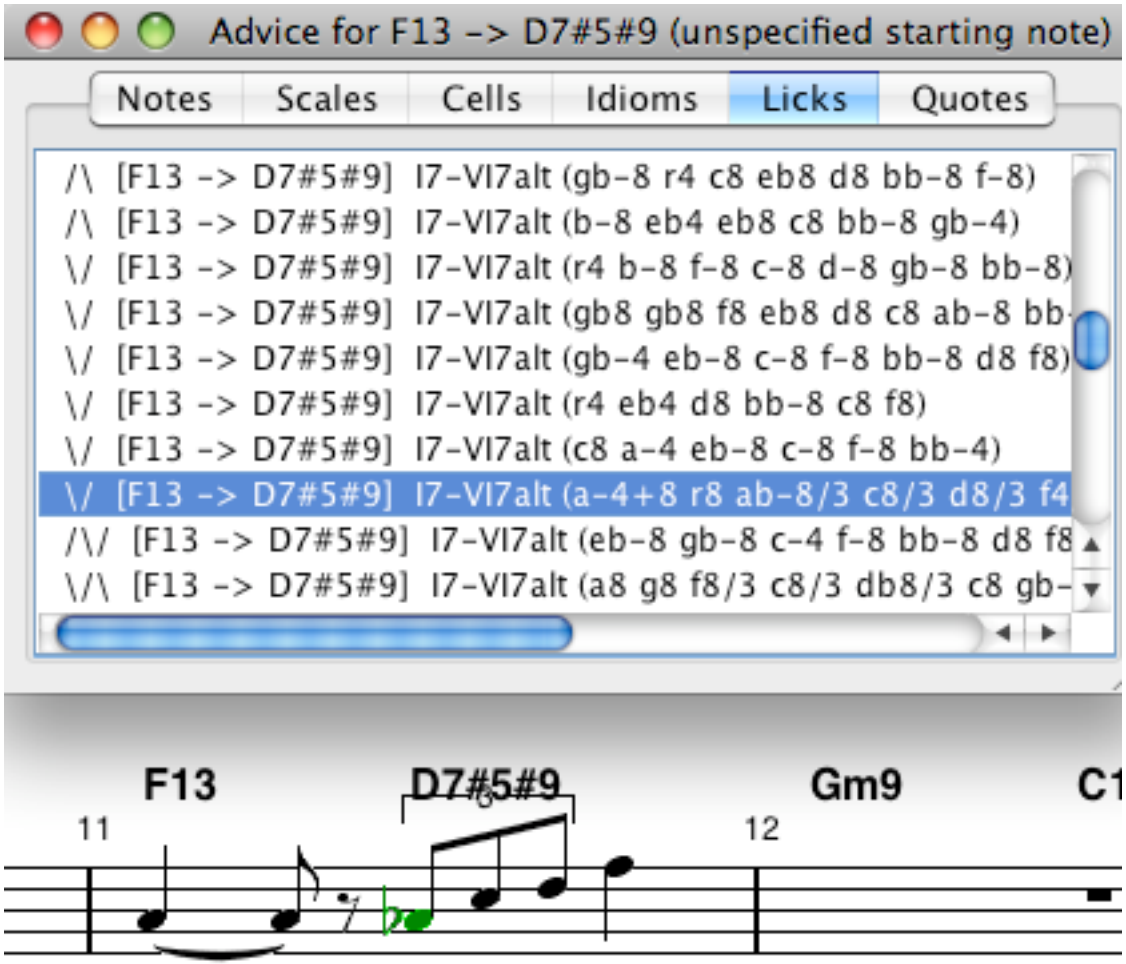


Note Coloration Option

- Black: Chord Tones
- Green: Color Tones ("Tensions")
- Blue: Approach Tones
- Red: Outside

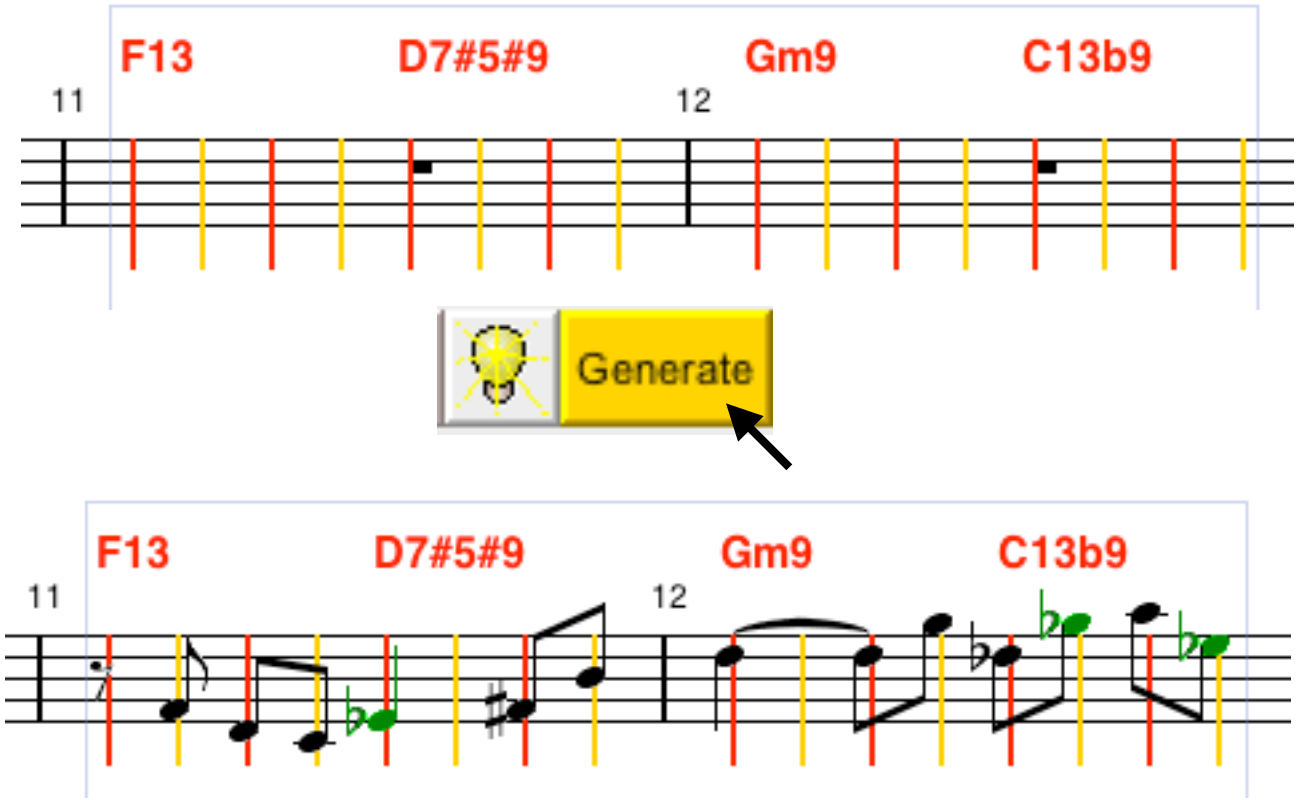


Future: Automate **search** for licks based on attributes

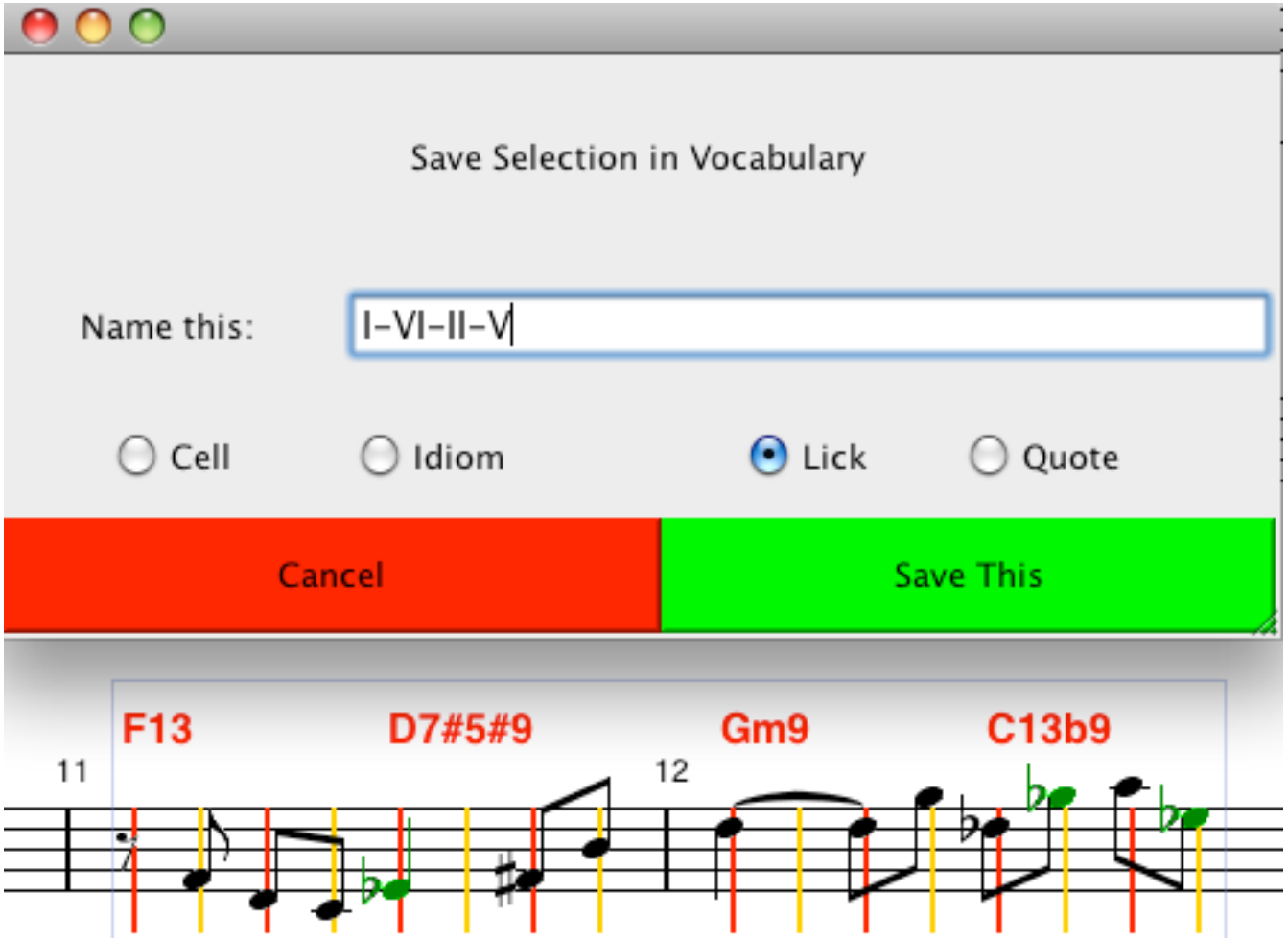


Lick Generator

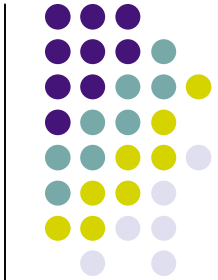
- Addresses Need for Novelty and Robustness
- Arbitrary-Length Chord Progression



Saving Licks for Reference



Future Advisory Work



- Automatically derive and display:
  - Key maps
  - Lego road maps
  - Analytic hints
- Locate chord progressions within a corpus of tunes (subject to any transposition) such as “The Imaginary Book”

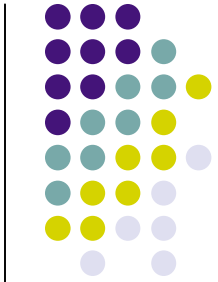
Grammatical Basis for Licks

- Grammar generates melodic lines using probabilities.
- Grammar rules indicate how **melodic space** is to be filled.
- Rules can be tuned to generate simple or complex melodies.
- The note coloration **categories** play an important rule.

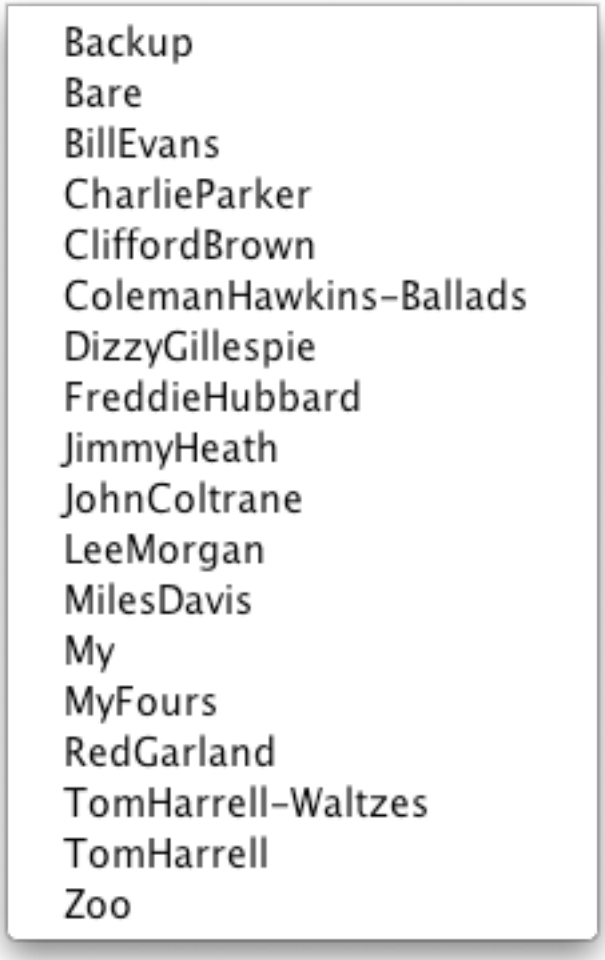
Grammar Learning Capability

- Impro-Visor can ***learn*** a grammar from a set of transcriptions.
- The grammar will generate lines containing figures similar to ones in the transcription, but still novel.
- The chord progression for generation need not be the same as in the transcriptions

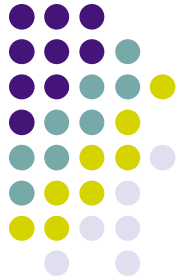
Expandable Grammar Repertoire



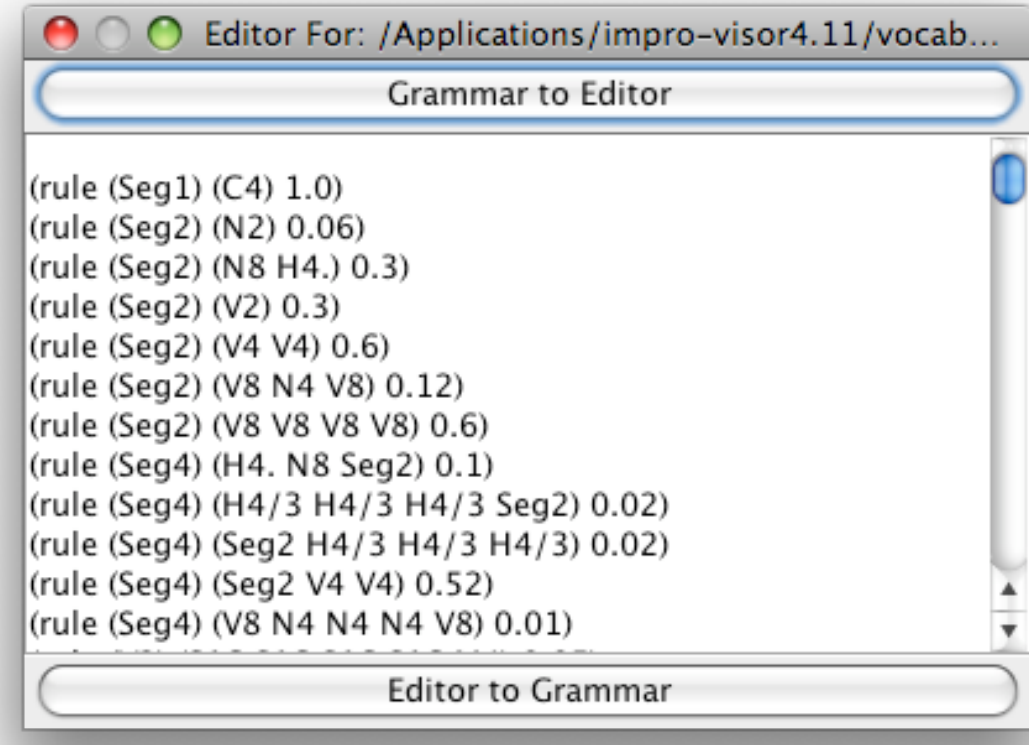
- Some preliminary grammars available:
  - Hand-crafted, or
  - Derived automatically from a few transcriptions.
- We need more transcribers.



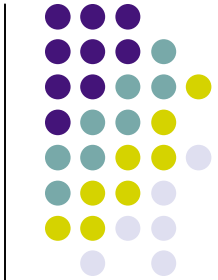
Future Work on Grammars



- Provide a more ***user-friendly*** interface for manipulating:
  - Editing and tuning
  - Mix-and-match rules
  - Automatically derive trading grammar from a given base grammar



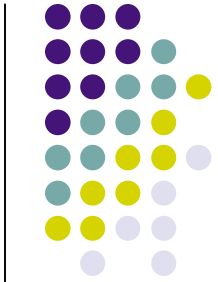
Multiple Purposes



- As Impro-Visor was improved based on further R&D, it developed a split personality:
  - Play-along tool
  - Composition tool
  - Ability to improvise on its own
  - Multiple styles and style extraction
  - Ability to learn aspects of soloist styles

  thus forming the basis for an **improvisation companion**.

Real-Time Usage

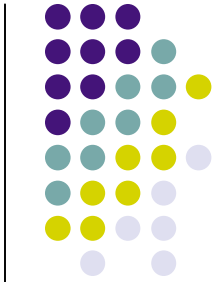


- Impro-Visor **auto-accompaniment** generated from
  - tune's chord progression, and
  - a style specification.

- Grammars can be used to specify **trading** 4's, 8's, etc.

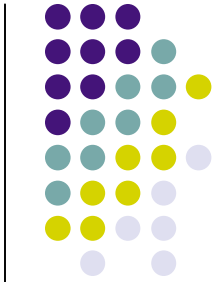
- Can improvise in real-time, and **continue indefinitely**, in principle.

Future Work on Real-Time Aspects



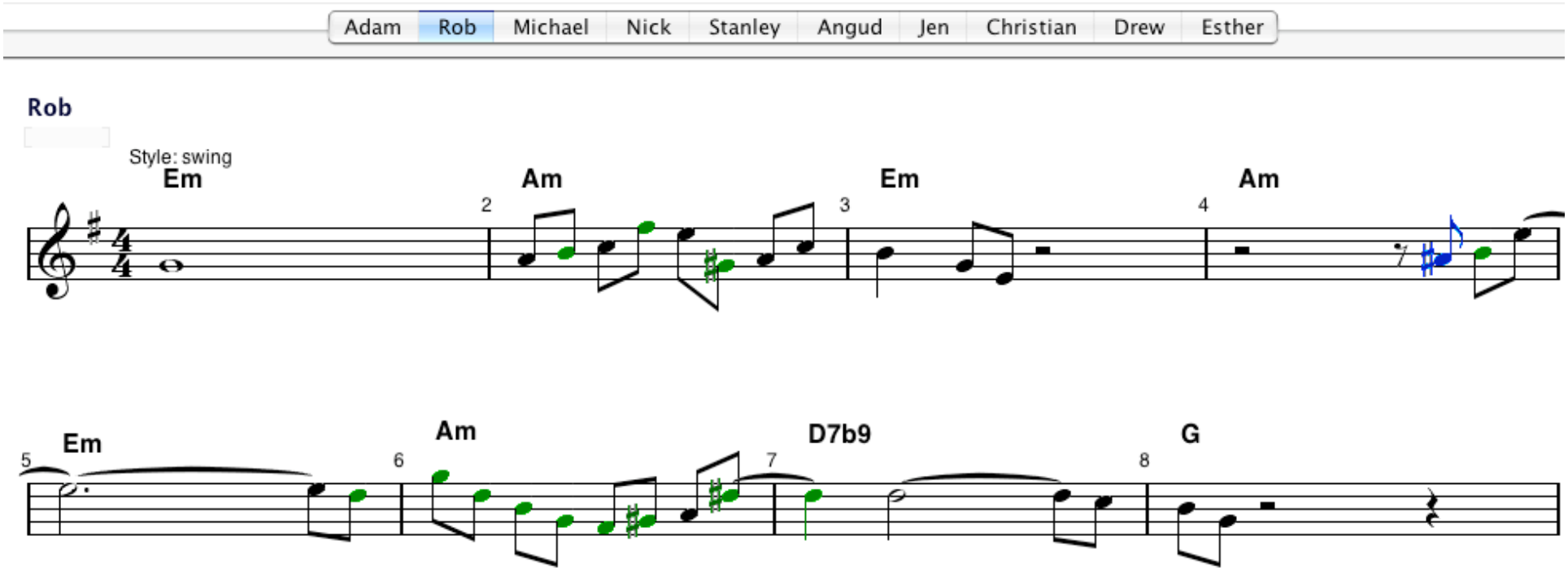
- Smooth out MIDI sequence transitions.
- Port the tool to hand-held devices, e.g. iPod
- Better MIDI input.
- React to user **audio** input.
- Lick learning in real-time.

Current Classroom Usage

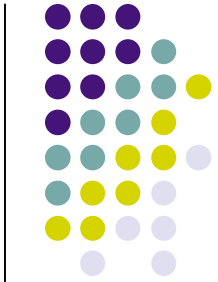


- Students are assigned the task of writing a chorus over the “tune of the week”.
- Students email their work to me.
- I composite the choruses and bring them to class.
- We listen to what they’ve written.
- They critique each others work.

Composite Tabbed Choruses



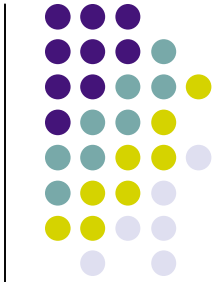
Textual Information Saving



- Lead sheets are saved in an openly-readable textual form I call “leadsheet notation”.

- Related notation is used to store:
  - Vocabulary
    - Scales, licks, etc.
    - Chords, voicings
    - Style specifications (swing, latin, rock, …)
    - Grammar specifications

Download Free (Mac, PC, Linux)



- Visit
  www.impro-visor.com

  (include the dash).

- User group (about 5500 members):

  http://launch.groups.yahoo.com/group/impro-visor/

- See also: Bob Keller's Jazz Page
  www.cs.hmc.edu/~keller/jazz