



musescore.org

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MuseScore
General
Information

MuseScore
Development

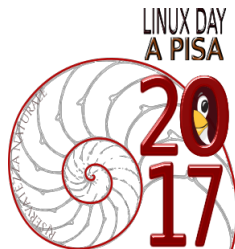
Piano Tutor
with Arduino

MuseScore: scrivere musica su Linux, e non solo

LinuxDay 2017 @ Pisa (Italy)

Facoltà d'Ingegneria, Università di Pisa

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Features at a glance #1/2



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- Editing WYSIWYG di partiture musicali

Carol of the Bells

Will_Ross Will_Ross

$\text{♩} = 200$

The image displays a musical score for 'Carol of the Bells' in 3/4 time. The tempo is marked as quarter note = 200. The score is in G major (one sharp) and consists of two systems. The first system shows the vocal melody in the treble clef and a piano accompaniment in the bass clef, marked 'mp'. The second system continues the melody and accompaniment, with the piano part marked 'mf'.

- Multi-piattaforma: Linux, Windows, Mac OS-X
- Orientamento alla stampa di qualità professionale
- Playback basato su fluid (SF2/SF3) / zerberus (SFZ)
- Input via tastiera PC, mouse e periferica MIDI esterna
- Importazione di brani da formato MIDI, KAR, MXL, ...
- Esportazione in formato PDF, MIDI, KAR, MXL, ...

Features at a glance #2/2



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- Infinità di simboli: note, pause, chiavi, tempo, accenti, articolazioni, dinamica, titoli, testo, karaoke, struttura, ripetizioni, ...
- Fino a 4 voci per pentagramma
- Controllo del playback: avanti/indietro, posizionamento visuale, tempo globale, volume globale, metronomo (e volume)
- Mixer pane: controllo individuale di volume, muto, pan, reverb, chorus, per ogni strumento



Demo



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- Time to play

MuseScore - Development metrics & notes



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- Linguaggi: C/C++, Python, Perl
- Compilazione: Makefile, cmake
- Librerie: Alsa, Jack, PulseAudio, PortAudio, PortMidi
- **Source metrics**
 - 2.2M lines of code (LOCs)
 - 2639 source files (C/C++, Python, cmake)
- **Developers community**
 - git log: 153 distinct committers since 2012
 - active: top 10 committers made ~87% of the commits
 - commits: 12480 since 2012; my 2cents:
 - a211db0cc Fri Aug 18 remove unneeded audio buffer overwrite...
 - c5330e73f Fri Aug 18 synth meter l/r bugfix

QML Scripting



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- MuseScore scripting language (QML) allows for automating repetitive tasks

```
MuseScore {  
  description: "This test plugin walks through all elements in a score"  
  menuPath: "Plugins.Walk"  
  onRun: {  
    console.log("Hello Walker");  
    var cursor = curScore.newCursor();  
    cursor.voice = 0;  
    cursor.staffIdx = 0;  
    cursor.filter = -1;  
    cursor.rewind(0);  
    while (cursor.segment()) {  
      var e = cursor.element();  
      if (e) {  
        console.log("type: " + e.name + " (" + e.type + ") at tick: " + e.tick + " color  
" + e.get("color"));  
        if (e.type == Ms.REST) {  
          var d = e.get("duration");  
          console.log(" duration " + d.numerator + "/" + d.denominator);  
        }  
      }  
      cursor.next();  
    }  
    Qt.quit();  
  }  
}
```



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- Features
 - LEDs can show notes being played by MuseScore
 - with MuseScore slow playback, it's even easier to follow
 - LED lights can be independently customized for the left and right hands
 - Left and right hands can be muted and practiced independently from one another
 - MuseScore can wait for user to press each keys sequence (chord) before moving on with the playback
 - Lookahead: LEDs can show both the next chord and the very next one in dimmer light
 - Looping: you can practice a segment over and over again until satisfied
 - loop on/off, loop start and loop end can be set via MuseScore MIDI Remote Control



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- Three major playing modes
 - slow playback: just follow the LEDs and get an overview of the notes and their timing
 - full tutor: let MuseScore wait for each key/chord press
 - full tutor with soft synth: connect MIDI to QSynth or FluidSynth on the PC

Piano Tutor



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- Check it out:

- LinkedIn step-by-step tutorial

- <https://www.linkedin.com/pulse/musescorearduinoleds-tutorial-tommaso-cucinotta/>

- YouTube video

- <https://www.youtube.com/watch?v=qSFTzFyzGeY>

- <https://www.youtube.com/watch?v=5COBWGxvRzE>

- GitHub repository

- <https://github.com/tomcucinotta/MuseScore/tree/piano-tutor>

- Instructables

- <https://www.instructables.com/id/MuseScoreArduinoLEDsMIDI-Piano-Tutor/>

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Conclusions



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- **Using** open-source software is plain, old *fun*!
- **Modifying** open-source software is quite a lot of *fun*²!
- **Contributing** back to open-source software just scales it out to the extreme: *fun*[∞]!

Thanks!



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- Time for questions