MuseScore+Arduino+LEDs+MIDI = Piano Tutor

By tcucinotta (/member/tcucinotta/) in Circuits (/circuits/) > Arduino (/circuits/arduino/projects/) 8.462 56 29 Featured

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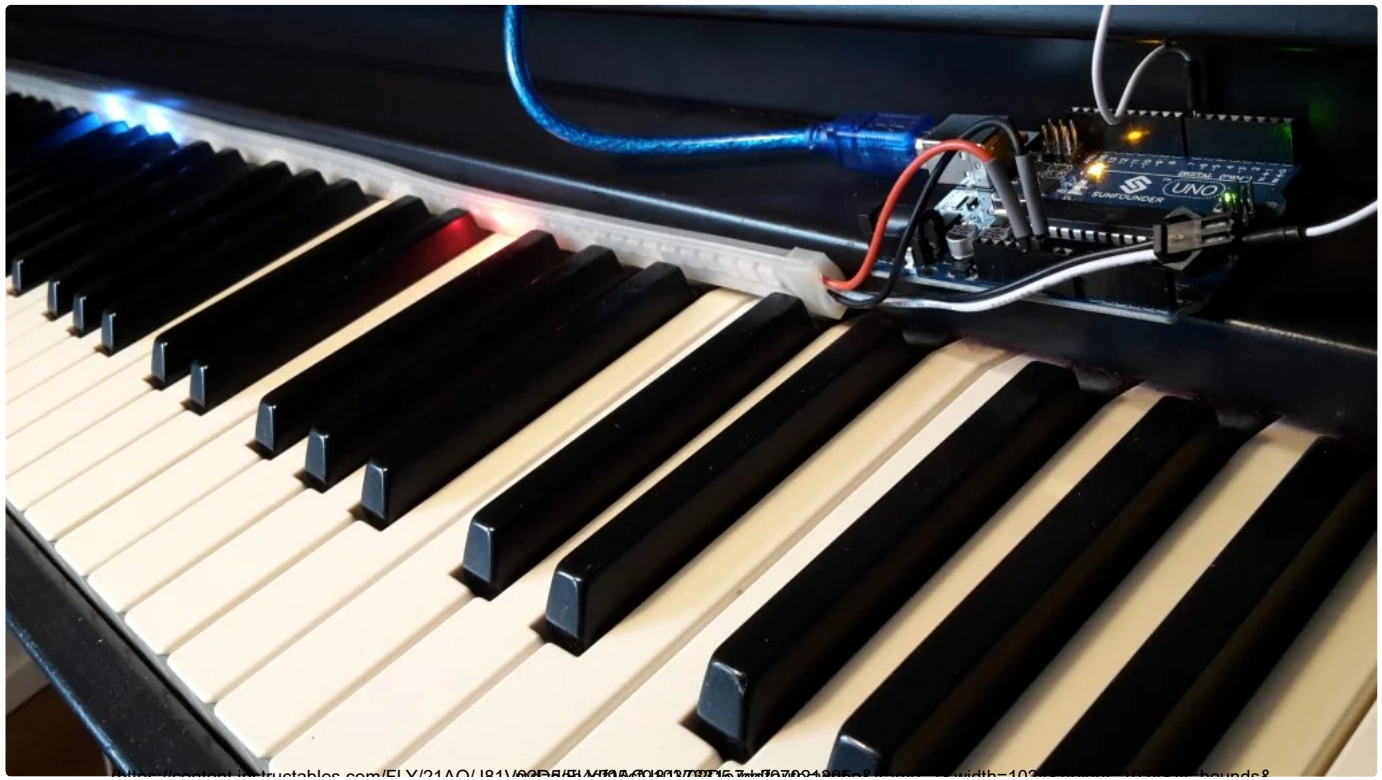

(/member/tcucinotta/)
By **tcucinotta (/member/tcucinotta/)**
http://retis.sssup.it/~tommaso ()

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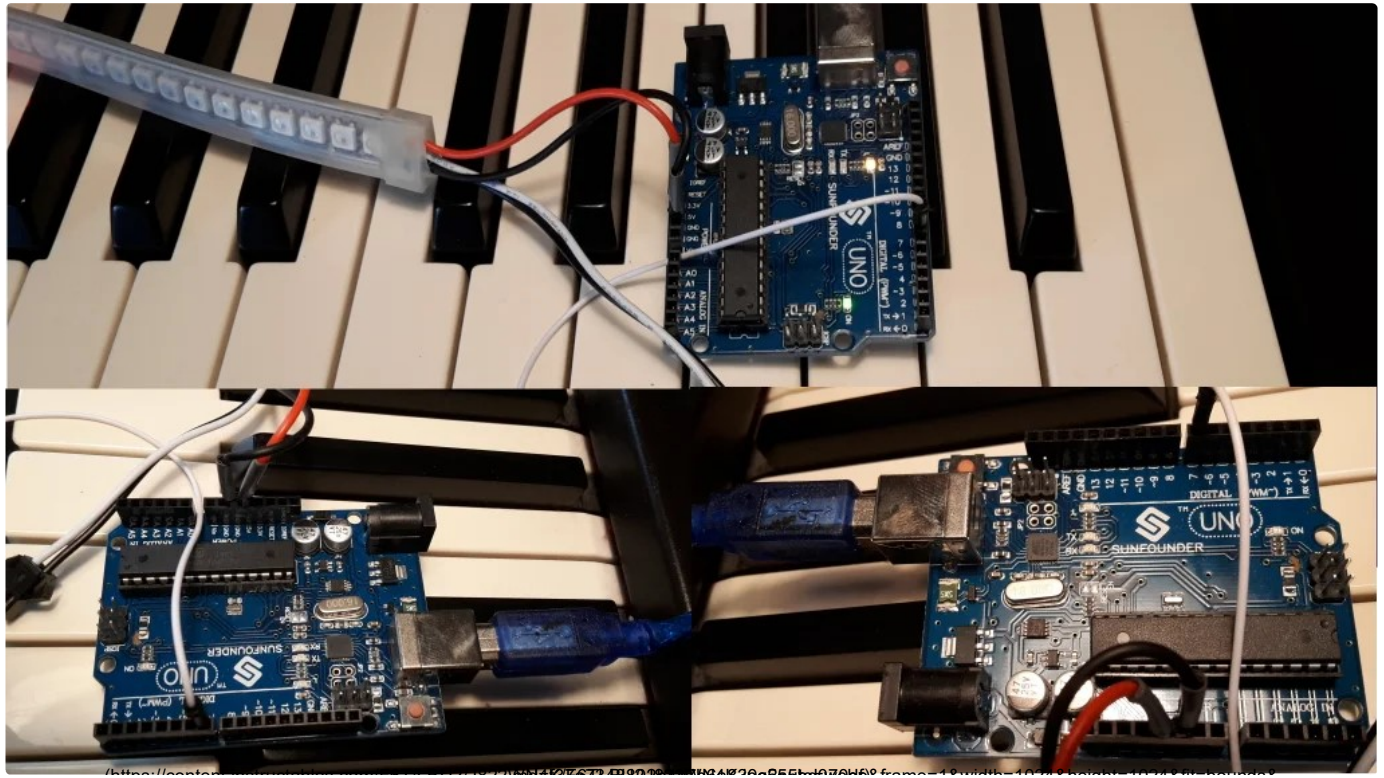
This article explains how to turn your MIDI-capable keyboard or digital piano into a full piano

learning & tutoring system, i.e. an interactive lighted keyboard/piano, based on the open-source MuseScore sheet music editor & player, a common Arduino board and a LED stripe. The system will let you practice a piano piece on the keyboard without any need for reading sheet music: just load any MIDI file on MuseScore, play it activating the Piano Tutor function, and then follow the LEDs lighting up on the stripe deployed along your keyboard, repeating as many times as needed.

Step 1: Hardware Set-up



First, connect the NeoPixel LED stripe to your Arduino, plugging the black and red wires of the stripe to the GND and +5V pins on your Arduino. Also, connect the input data wire to the pin n.7 on your Arduino. The image shows how I did it in detail, however you can find more details on the Adafruit website (https://cdn-learn.adafruit.com/assets/assets/000/030/892/small360/leds_Wiring-Diagram.png?1456961114).

Step 2: Software - Arduino

Download the software:

```
git clone  https://github.com/tomcucinotta/MuseScore.git (https://github.com/tomcucinotta/MuseScore.gitcd)
cd MuseScore
git checkout piano-tutor
```

Install the Arduino IDE on your PC/laptop, then open within the above checked out git repository the miditools/PianoTutor/PianoTutor.ino file, and upload the program onto Arduino.

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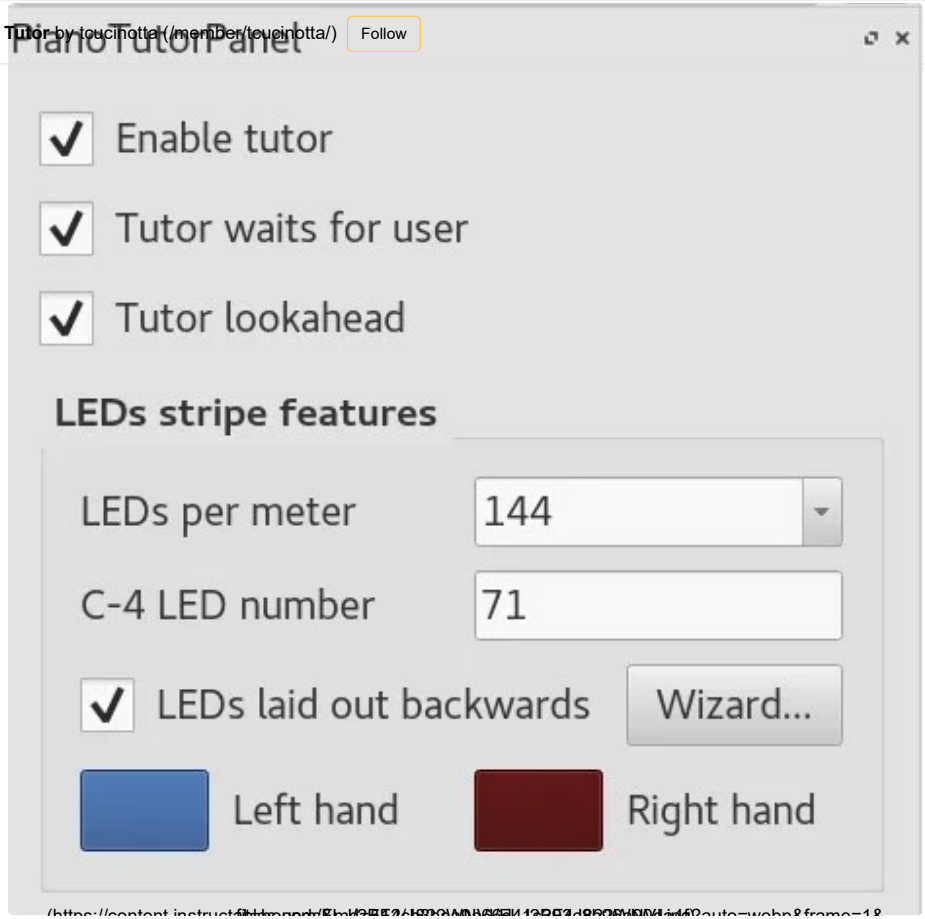
Step 3: Software - MuseScore on Linux



Ensure you have all the build dependencies on your Linux PC:

```
sudo apt-get build-dep musescore
sudo apt-get install cmake-qt-gui
```

then, compile and install the modified MuseScore:

```
make PREFIX=/usr/local/mscore-git SUFFIX=-git release
sudo make install
```

now you're ready to launch it, opening a MIDI file of your choice:

```
/usr/local/mscore-git/bin/mscore-git /path/to/file.mid
```

and opening the Piano Tutor pane, pressing 't' (visible in the picture).

Step 4: MIDI Connections

Ensure your USB MIDI keyboard, or MIDI-to-USB adapter, is plugged into your Linux PC/laptop, and use qjackctl to ensure its MIDI port is connected to the MuseScore MIDI input port (see picture).

Step 5: Have Fun!

2 People Made This Project!

Have fun practicing with the millions MIDI files available on the Internet, without the burden of reading sheet mu or (https://www.you

Should you have ic additional details e, tutorial-tommasc

aminesouguir (/member/aminesouguir/) made it! DavidR882 (/member/DavidR882/) made it!

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(/member/ChristianS304/) ChristianS304 (/member/ChristianS304/) 5 years ago

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This is a really nice project, which is well written. Being a Windows user, but with some experience with Linux, I made a Persistent Live system on a USB stick with Ubuntu 16.04. There were several steps that initially failed, due to packages not available - but I made it to compilation which had a few errors. According to Musescore installation, QT5.8 is required - which is big and not available on apt (at least from what I can see - so I might need to start over. Is there any preferred Linux distro / other tips for this project which might make it easier for me, having a Windows computer?

4 replies

(/member/charmelink/) charmelink (/member/charmelink/) 3 years ago Reply Upvote

Man I would really love to make it work, but I'm getting an error in the PianoTutor.ine file, it says there's a “stray #” on line 31 ...the one that goes “#define NUMPIXELS 144”

I know this post is relatively old but I hope you can help me, please!

1 reply

(/member/NZP2/) NZP2 (/member/NZP2/) 5 years ago Reply Upvote

Thanks you for sharing, I have made similar, but I made my own LED bar using 2 of 8x7 LEDs segment driver Max7216 and drove that with your code. I have full 88 keys and matching LED to cover the entire range. It works very well. The only trouble I have is that the settings. I have to change it every time as musescore doesnt seem to remembered it. I used the precompiled version you post for windows. is there away to make the setting stored in Musescore, particularly the COM port number, the number of LED, the C4 key# in the Piano Tutor panel?

3 replies

(/member/tcucinotta/) tcucinotta (author) 5 years ago on Introduction Reply Upvote

Now the modified MuseScore software is (also) available as a binary release, for Ubuntu/Debian Linux as well as Windows:

https://github.com/tomcucinotta/MuseScore/releases (https://github.com/tomcucinotta/MuseScore/releases)

(/member/tuanh44/) tuanh44 (/member/tuanh44/) 5 years ago Reply Upvote

I find this a great project for my children to start interested in piano. So I decided to make one and finished with arduino part, but I'm having problems with compiling MuseScore (even with original version). Those started with "Q_NAMESPACE' does not name a type...". Can you also share your laptop Ubuntu version, as I'm considering reinstall the OS to match it. Thanks a lot for any advice!

1 reply

(/member/DavidR882/) DavidR882 (/member/DavidR882/) 5 years ago

Reply Upvote

I am having fun when playing with the piano tutor, thanks! One suggestion for future upgrade is that if replacing arduino with raspberrypi and a tiny screen, then the whole system is more portable without a PC. I have tried to replace the PC with raspberrypi, but I can't run the make command successfully, there are some build dependencies issues.

3 replies

(/member/Louise+Hudson/) Louise Hudson (/member/Louise+Hudson/) 5 years ago

Reply Upvote

Very well explained about Piano Tutor .And its Great informatinon

1 reply

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