

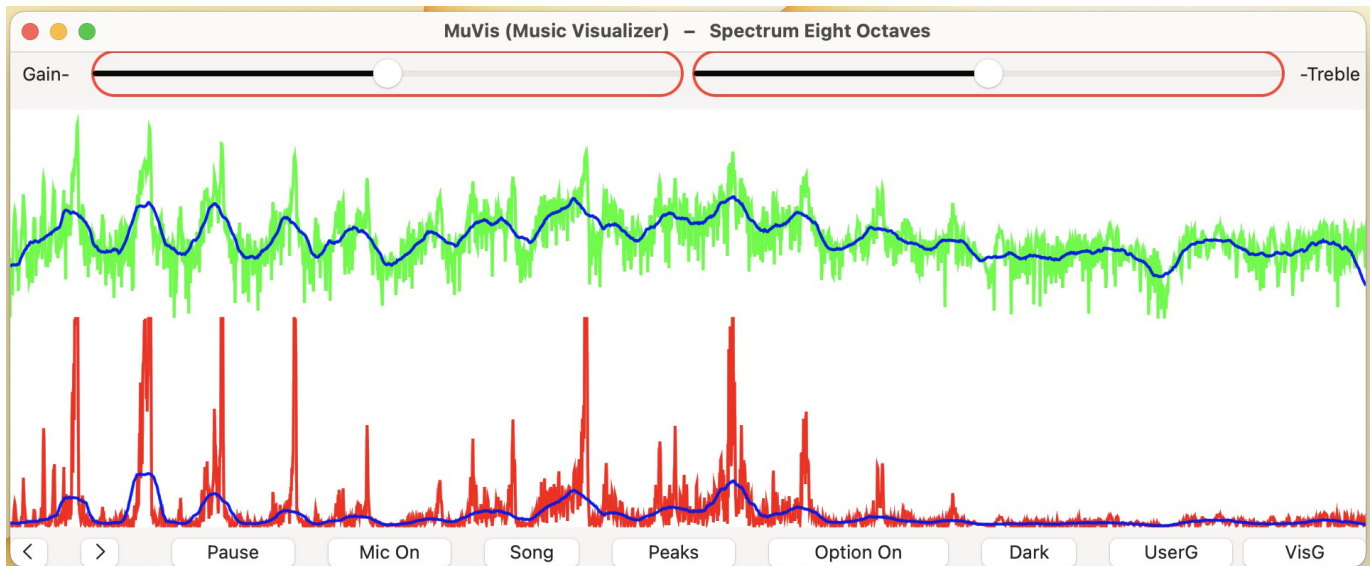
# MuVis User Guide

## MuVis - an Audio Visualizer app for Music

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When the MuVis app first opens, the on-screen display should look somewhat like:



and the computer's speakers should be playing music from a pre-loaded royalty-free music file. (Currently, the song file is "The Elevator Bossa Nova" from [Bensound.com](https://www.bensound.com).) The on-screen display shows a real-time dynamic visual representation of the audio that you are hearing.

On your Mac, click-and-drag any corner of this window to freely re-size it to any width and height you wish. Some users like tall thin windows; some like short wide windows; while I prefer approximately square windows.

On a Mac, the menu bar at the top shows the app's title "MuVis (Music Visualizer)" followed by the name "Spectrum" of the particular visualization selected for display. On an iPhone or iPad, the menu bar is not displayed.

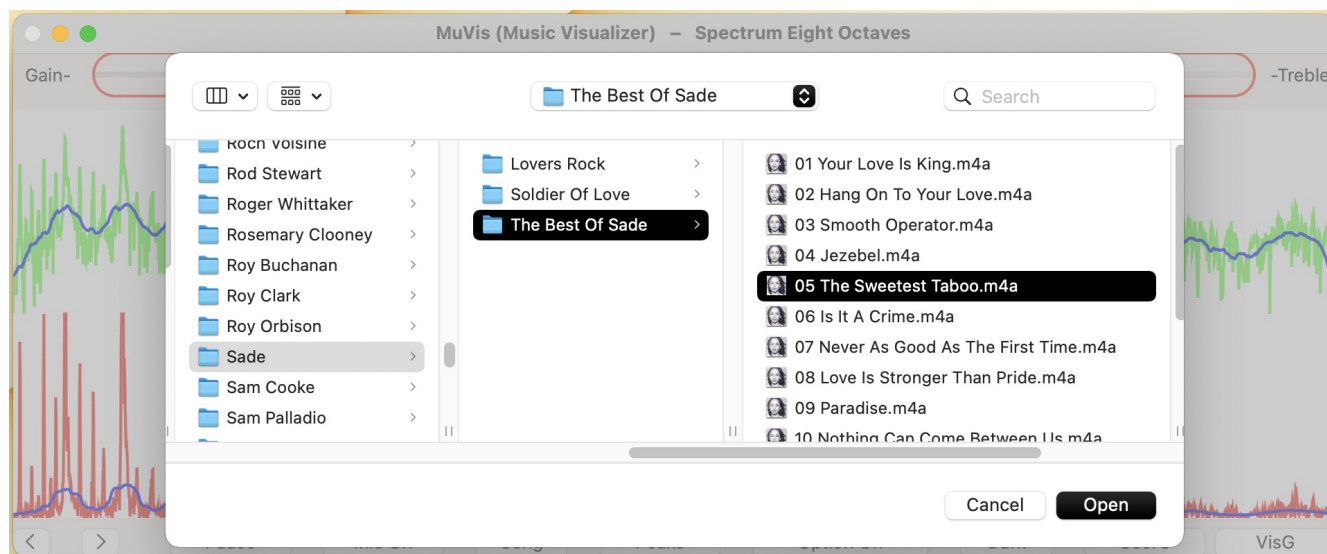
The top and bottom toolbars contains buttons and sliders to allow you to control what you see.

At the bottom left are two buttons labelled by left- and right-chevrons. Clicking the left one changes the display to the previous visualization, and clicking the right one changes the display to the next visualization - which allows you to cycle through the twenty-five visualizations currently provided by the app. On a Mac, as a convenient keyboard-shortcut, you also can simply use the left-arrow and right-arrow keyboard keys to cycle back-and-forth among these visualizations.

Adjacent to these chevrons is a button labelled "Pause". When clicked, it stops the music playback and freezes the visualization display. The button label changes to "Resume" which, when clicked, causes the music playback and the visualization display to continue.

The adjacent button is labelled "Mic On". When pressed it stops playing the audio from the selected song file (and also stops it's visualization), and starts playing the live audio from the microphone (and starts it's visualization). The label then becomes "Mic Off" - which, when pressed, performs the reverse actions.

The next button is labelled "Song". (It is disabled and grayed-out if the microphone is enabled.) When the button is clicked, a sub-window pops up looking somewhat like:



On a Mac, it allows you to select whatever songs you want from your own Music folder. Selecting a song (by navigating your Artist and Album structures and clicking on its name) causes that song to play - and the visualization to render its dynamic attributes. Unfortunately, on an iPhone or iPad, the pop-up window allows access only to songs loaded into your iCloud Drive folder. (Apple allows only its own Music app to have access to songs in the iPhone or iPad music library.)

The adjacent button is labelled "Peaks". When clicked, it passes the audio signal through a "spectral enhancer" filter which enhances the display of spectral lines (usually the harmonics of musical notes) and reduces the display of noise (usually percussive effects which smear spectral energy over a large range.) The label then becomes "Normal" which, when clicked, removes the enhancing filter. (Note that this enhancement applies only to the visual display, not to the audio you are hearing.)

The adjacent button is labelled "Option On". When programming these visualization algorithms, there are numerous variations and options available. Rather than allowing just one variation, this button allows the user to select to see a second variation. (Perhaps a future release will allow multiple options.) The option rendered is different for each visualization. The user should check out the option for each visualization to see which she likes.

The adjacent button is labelled "Dark". When clicked, it toggles the app's window to Dark Mode. (Alternatively, if the window is currently in Dark Mode, the button label will be "Light" and when-clicked will toggle the window into Light Mode.) Different visualizations look subjectively better or worse in either Light or Dark Mode. Feel free to experiment and pick your favorites.

Finally, at the right end of the bottom toolbar are two buttons labelled UserG (for User Guide) and VisG (for Visualization Guide). Clicking either button activates a "Quick Look" popup window to display the app's documentation. The User Guide (the document you are currently reading) explains the functionality of the app's user interface. The Visualization Guide describes the purpose of each visualization - probably in more detail than you want.

The top toolbar contains two sliders - one controlling "Visualization Gain" and the other controlling "Visualization Treble Boost". As their names imply, sliding them adjusts the gain and slope of the visual data representation. (Note that they do NOT adjust the audio levels of the music your are hearing.) They allow subjectively adjusting the display to be the most pleasing - despite whether the musical passage is very quiet or very loud.

Note that, whenever the “Mic On” button is clicked, the “Song” button is disabled (grayed-out).

Note also that, whenever the “Pause” button is clicked, the “Mic On/Off”, “Song”, “Peaks/Normal”, Previous Vis”, and “Next Vis” buttons are disabled (grayed-out).

On a Mac, for convenience, I have enabled keyboard shortcuts for some of these buttons:  
pressing the keyboard's left-arrow key presents the Previous Visualization;  
pressing the right-arrow key presents the Next Visualization;  
pressing the up-arrow key toggles between light- and dark-mode; and  
pressing the down-arrow key toggles between the “Option On” and “Option Off” modes.

Personally, I enjoy running the MuVis app on a Mac while keeping my right-hand fingers on the keyboard's up / down / left / right arrows – to facilitate easy toggling through the various options.

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The simplest way to use MuVis is to manually select each song you want to play (and visualize) using the “Song Selection” pop-up window described above. However, for Mac users, the following alternative way is available:

1. Click on the “Mic On” button so that MuVis displays the visualization of whatever audio the microphone hears.
2. Run the Apple Music app (or any other music player app) to select and play any song from you music library (or from any music subscription service). This audio will be played through the Mac's speakers – which will be “heard” by the microphone – resulting in the screen rendering a visualization of the music playing.

This “speaker to microphone” acoustic process may result in undesirable audio feedback and the introduction of background noises. But these problems can be eliminated by using the Loopback app (sold by Rogue Amoeba for about \$100). Loopback allows the Mac's microphone-input circuitry to “electronically tap into” the audio driving the computer's speakers such that the audio signal being fed into MuVis is the pristine audio signal being supplied by your music-player app. I use this process to “get the best of both worlds” - that is, the convenience of using the Apple Music app to select songs and playlists – as well as the visual renderings provided my MuVis.