

The Alternate Picking Plugin for Sibelius

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As a guitarist, I had been working on using strict alternation of pick direction when flatpicking. I decided it would be easier to write a plugin to calculate the desired direction rather than marking up scores by hand, or adding them in Sibelius note by note.

Alternate picking does not alternate pick direction for every succeeding note, but it chooses different locations to use downstrokes to emphasize those notes. This appears simple, but once you get into specific details, the plugin has a lot of decisions to make.

These are the rules I am using:

- * The first note in each bar gets a downstroke
- * Notes on the beat get a downstroke.
- * Notes not on the beat are evaluated as if each note in the beat, bar, or selection (user option) had the shortest duration of notes in the current bar. The sounding notes are marked as if all the notes of that duration were present.
- * Notes tied-to, slid-to, or under slurs are not marked.
- * Compound time (6/8, 9/8, 12/8) uses a dotted quarter note as the beat, so 8th notes in 6/8 are marked DUDDUD, though there is an option for 6/8 time only to mark as if $\frac{3}{4}$, so 8th notes would be played DUDUDU
- * Notes in tuplets, such as triplets, alternate pick direction even if the beat changes within the tuplet. The direction of the first note in a tuplet is based on the preceding notes, as explained below.

I wrote the plugin to work with simple fiddle-tune style pieces, and it works well there. It should work on any score, but I suspect that as complexity increases, it will be less likely to produce the results you want. It still might save some time, though.

If the plugin generates pick directions you do not want, I suggest trying the *Add Articulations to Notes* plugin to manually change articulations, or just to add them in the first place. It is probably more convenient than using the keypad for this task.

This plugin requires Sibelius 6.2 or later.

I would like to go into more detail on several topics

1. Which notes in a bar get a downstroke?
2. How do you handle time signatures like 5/4 or 6/8 or others that can have different "beat groupings" for notes in a bar?
3. How is the picking direction determined for notes that are not on the beat?
4. When determining the smallest note duration used to determine pick direction for notes not on a beat, how far from the current note should you look to determine the smallest duration?
5. How are pick directions for notes in tuplets determined?

Which notes in a bar get a downstroke?

The first note in a bar always gets a downstroke. This is about the only sure rule. The goal is to emphasize the strong beats, and the initial note is as strong as beats get.

After the first note, notes on the beat get a downstroke. This suggests the question: which notes are on the beat.

This depends on the time signature and possibly on different groupings of notes within a time signature. In 4/4 time, a beat is a quarter note, and so the beat, and the downstroke, will occur each quarter note. Here are some examples where downstrokes come each quarter note. (There will eventually be downstrokes on other notes as well, but these exist because the note is on the beat).



In other time signatures, it gets a bit tricky. In 6/8, for example, the beat is a dotted quarter note, or 3-8th notes, so there are 2 beats in a bar. Using this rule, you would have 2 downstrokes in a bar of 8th notes, on the first and 4th 8th note:



But sometimes 6/8 is treated as having 3 groups of 2-8th notes, and if that happens, the downstrokes fall on the first of each group of 2 notes, as in



Note that the 2nd dotted quarter gets an upstroke; the beat that would get the downstroke is not played.

This will be discussed further below, but at this point, the idea is that once you determine which notes are "on the beat", those notes should get a downstroke. There will be other notes that get downstrokes as well, but those will be for different reasons.

How do you handle time signatures like 5/4 or 6/8 or others that can have different "beat groupings" for notes in a bar?

Like 6/8, there are other time signatures that group the notes, and these groups determine where downstrokes will appear. In Sibelius, you can set Beam and Rest groups when you create a time signature, and the first note in each group would get a downbeat.

Unfortunately, a plugin cannot tell the Beam and Rest group for a particular time signature, but this plugin uses its own list of groups for different time signatures. The number on the left is the top number (numerator) of the time signature, and it tells how many notes the bar contains in the

duration of the bottom number (denominator). You can edit these groups, and your changes are saved across sessions.

So you can see that 6/8 uses the grouping 3+3, so there are 3-8th notes in a group. 6/16 would also have 2 groups of 3, but these would be 16th notes. At some point a user of this plugin will be able to change the groupings for a time signature. Any numerator greater than 13 will be treated as if the grouping was a long string of 1's. (Just because I had to stop at some point).

1:	<input type="text" value="1"/>
2:	<input type="text" value="1+1"/>
3:	<input type="text" value="1+1+1"/>
4:	<input type="text" value="1+1+1+1"/>
5:	<input type="text" value="3+2"/>
6:	<input type="text" value="3+3"/>
7:	<input type="text" value="3+2+2"/>
8:	<input type="text" value="1+1+1+1+1+1+1+1"/>
9:	<input type="text" value="3+3+3"/>
10:	<input type="text" value="3+2+3+2"/>
11:	<input type="text" value="3+3+3+2"/>
12:	<input type="text" value="3+3+3+3"/>
13:	<input type="text" value="3+2+2+3+3"/>

Note that 5/4 is set up as 3+2. So the downstrokes would go to



If it were set to 2 + 3, we would see



Setting downstrokes on the beat is the first thing the plugin does. Once it has these in place, it can decide what to do for notes that are not on the beat.

How is the picking direction determined for notes that are not on the beat?

In rough terms, once you know where the beats are, you alternate the pick direction for the remaining notes. If all the durations are the same, the plugin will do this. Here is a 4/4 example:



The note after the beat gets an upstroke, then a downstroke, then an upstroke, until another note on the beat is encountered and the process is restarted.

More specifically, the plugin works by dividing the durations between beats into pieces the size of the smallest duration encountered (16th notes in the example above). How many notes you look at to determine the smallest duration makes a difference, but for now, let's assume that we look at all the notes in the current bar. (The issue of where to look for the smallest duration will be discussed below).

Since the downbeat is marked D, it then alternates UDUDUDUD for successive pieces, and notes that fall at a particular piece are marked accordingly. So in the example above, the smallest duration was 16th notes, and the first beat was divided into 4-16th note pieces (shown here as rests)



The 16th notes were then placed at their appropriate locations (one at each rest), and they are marked according to their position, with the results shown below, after this procedure was applied to all beats in the bar.



If there is a mix of durations in a bar, it gets more interesting (and complex). If you have something like this:



with the beats marked in red, and choose the 16th note as the base unit, since it is the smallest duration in the bar, the beat division looks like this:



As you overlay the notes back in place, you get this, with each bar showing the next beat processed:



So this is what the plugin currently does (as of March 2011). You get different picking patterns if you choose a different range to look for the smallest duration, (and you may prefer a different pattern), and I discuss that below.

If you have a rest, or a note is tied to, slid to, or under a guitar bend or slur (for a hammer-on or pull off), you *pretend* to pick that note, and the following note is played as if you had played the earlier note (the red notes are where the downbeats are or would be):



The goal here is to keep your hand moving regularly, emphasizing the same beats whether a note is picked or not.

The patterns change when the smallest note duration changes. Here is an interesting problem with mixing 8th and 16th notes. In this example, the 16th notes are tied together, so the tied-to note is not picked. These 2 bars have the same pitches at the same durations, but the picking pattern is different:



(The 3rd bar shows the direction pattern of the 2nd bar, but with the tied notes combined).

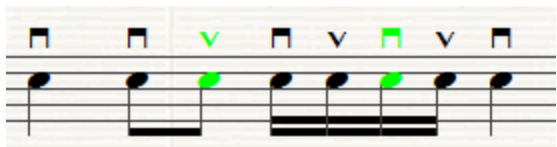
The green notes are at the same positions as the upstroke 8ths in the first bar, but they are (properly) played with a downstroke. If these groups are separated, at least in different bars, this is not so bad. But if they were halves of the same bar, you might not want to have these different patterns.



Now, you would not be likely to see this in a real piece, but you might see



If you put downstrokes on the beat and then alternated every other note, you would get



If we determine the pick direction according to the note durations within a *beat*, this is what we get, and it seems a reasonable solution (at least it does to me). But if we look at the entire bar (or possibly even look at a larger area), we might employ a different principle, which is to use the smallest duration in the area we are looking in as the basis for the pick direction. So looking at the entire bar, we see 16th notes, and so we can treat the larger notes as groups of tied 16th notes, as in:



So in this example, the 2nd 8th note would be played with a downstroke. This has the advantage of maintaining the same underlying rhythm (16th notes) and accenting over the entire sequence. At the same time, it requires you to look over a larger area before you can decide which pattern to use, and that could be a disadvantage.

Here is another example, in 6/8, starting with just the beats marked with downstrokes. the 2nd bar determines the pattern by beat, and the 3rd determines it based on the entire bar.



In this case, I think it is fairly obvious that the 2nd half of the bar should be treated as if all the notes were 16ths, since there are different durations even at the level of the beat. But one can still question whether that first 3-8th notes should be DUD or DDD.

At this point, it is not clear to me whether the pick direction should be determined at the level of the beat, or at the level of a bar, or even of a larger area (such as all selected bars). I don't know if there is a clear mechanical advantage of one over the other, or if it is simply an artistic decision, to be made on a case by case basis.

Unfortunately, the plugin cannot make such decisions, so it allows you to choose whether to look at the beat, bar (default), or selection level. It will then choose the pattern that derives from considering all notes *in the range you choose* to be multiples of the smallest duration.

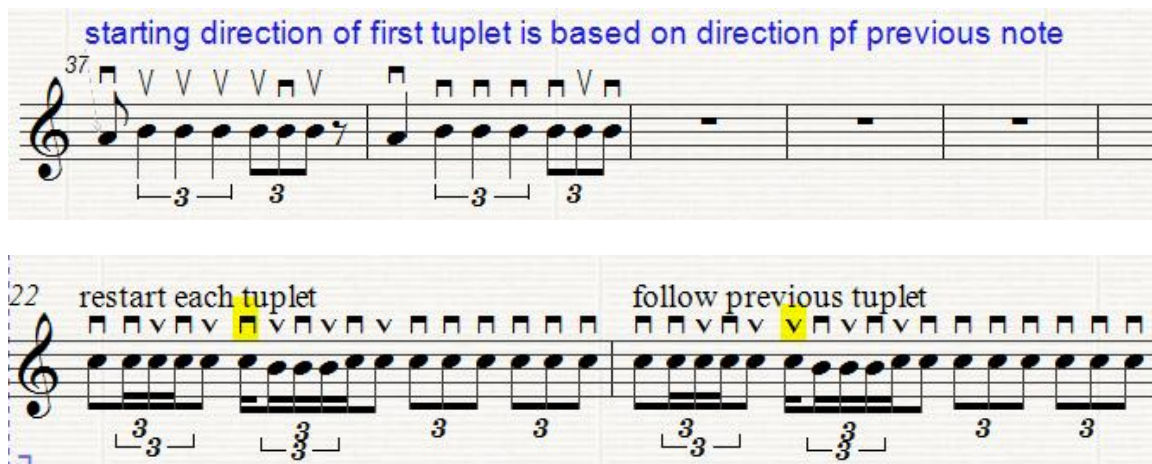
When determining the smallest note duration used to determine pick direction for notes not on a beat, how far from the current note should you look to determine the smallest duration?

The plugin lets you choose to look in the current beat, the current bar, or in the entire selection for this.

How are pick directions for notes in triplets and other tuplets determined?

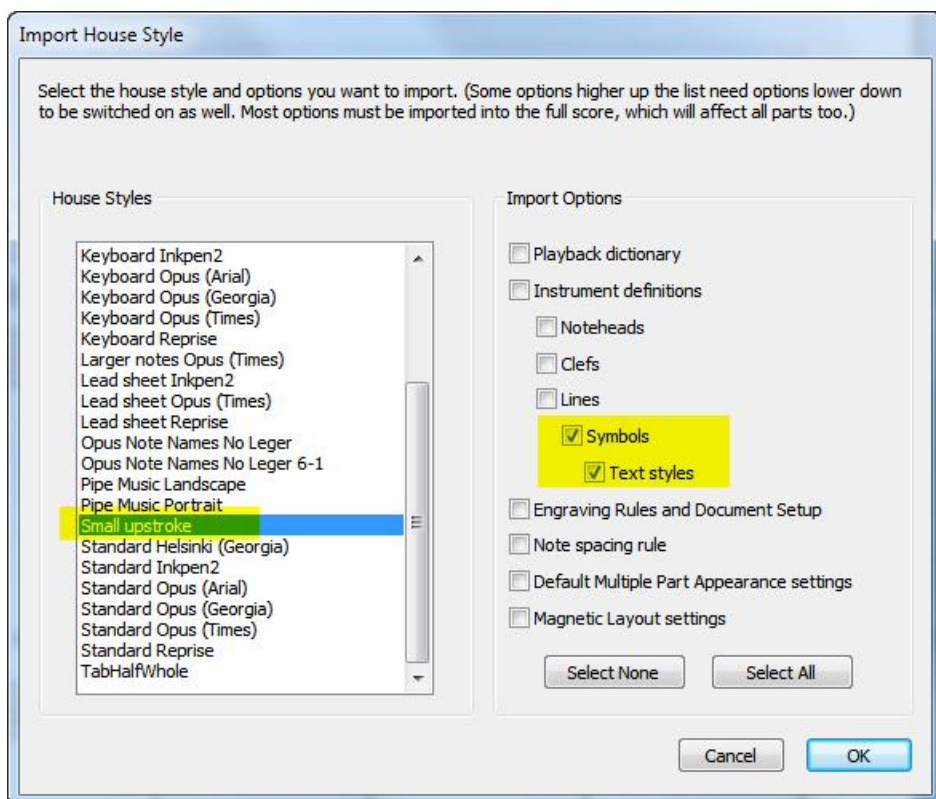
There are lots of possibilities for triplets, several of which ensure that the triplet ends on an upstroke. This is beyond the scope of the plugin to figure out. This is what the plugin does:

1. Note directions of any notes *outside* triplets are determined as if the triplet were a rest of its playable duration. So the note *following* a triplet will have the same direction regardless of the direction applied to the notes within the triplet. Thus, triplets are self-contained.
2. The direction of the first note in a triplet is determined by its position in the bar, or by the direction of the last note in an immediately preceding triplet, if any, depending on the choice of an option in the dialog.



3. The remaining notes in the triplet alternate direction, based on the smallest duration in the bar. So in the example above, the 2nd note is a downstroke because the first note is an 8th note, and that would generate DU when treated as 2-16ths.
4. Notes in nested triplets are considered as an uninterrupted stream of notes, as if they existed in the outermost triplet. They never restart at the start of a nested triplet.
5. While there are a number of picking patterns used with triplets, the plugin only uses 2, which are available as options when the plugin is run: either DUD DUD DUD (restart) or DUD UDU DUD (continuous). These are really the only ones that can deal with arbitrary triplets (pentuplets, sextuplets, etc.) in arbitrary time signatures.

The upbow articulation, while traditional, is a bit tall for my taste. I have made up a symbol that uses the shorter marcato symbol turned upside down. I have created a House Style that includes that symbol, and if you copy it to your user House Style folder, you can import it into your scores or even Manuscript papers. It is based on Opus font, so you may need to modify the house style if you use different music fonts.



After the import, your upbows will look like this:

