Andreas Kissenbeck, München/Münster

Model Analysis. A Theoretical Approach to Analysing and Creating Melodic Material

Before entering into model analysis I would like to give you an idea how I think about jazz theory in general.

When we start learning music we are collecting information like these black dots on the blank sheet. So we have to remember and handle all these informations in our brain. This is the normal way and it works very well.

But wouldn't it be great to have the whole picture? It would. More information can be easier to handle, than less information if the whole picture it has a structure. Therefore what we see right now is much easier to remember and to handle then the dots that we saw before.

What you see here is the picture of Gauss. His work was crucial for the development of precise maps as we use them today. And I would like to show you that model analysis works like map. It shows the whole picture because it provides an overview over all kinds of melody in tonal music.

So let's get started. As the name suggests, this is based on a model that you can see right here.

This graph is understood like this: if you have melodic material, for example the transcription of a jazz solo, then you pick out one melodic phrase. And within this phrase you pick a segment, that is harmonically one unit. So it mustn't express chord changes but it has to sound like fitting to one chord. Then you can imagine this segment as being put together like this:

- First there is a pitch set. This ist he group of notes, which are harmonically relevant.
- Then these notes of the pitch set are in a certain position. That means that they are arranged in close or wide position and in a certain inversion.
- Then these notes appear in a specific order. So one note is first, one second, ...
- Finally it may be that some of these notes are figurated. Figuration means embellishments, passing notes, auxiliary notes, suspensions, notes that JAZZ musicians call APPROACH NOTES. The special thing about these notes is that they are harmonically not relevant, so they don't affect the harmonic content of a the melody.

I explain this to you again with an example. Here is a melodic segment that can be heard harmonically as one unit. Then you can imagine this segment as being put together like this:
- The pitch set is a G major triad.
- It is arranged in closed position, first inversion.

- The order is upper, lower, middle.
- Finally the last note, the d is figurated by a two note approach. Diatonically from above, chromatically from below. This is the classical Charlie Parker hinge.
- And in combination with the specific rhythm, this is apparently our melodic segment shown above.

Now if you want to analyze melodic material by using the model, you have to go through this illustration in reverse.

1. Step: Determine segment (harmonic unit).
2. Step: Determine figurative notes.
3. Step: Determine position.
4. Step: Determine order.
5. Step: Determine group of notes.

Step 3 and 4 show structural aspects of the melody doc. Step 5 is considered especially insightful because it reveals (offenbart) the harmonic content of the melodic segment.

Before embarking (einsteigen) on practical analysis, one further aspect is to be clarified: musical analysis is always influenced by subjective perception. Andreas Moraitis has demonstrated this impressively in his thesis. An advantage of the model analysis lies in the fact that you can pinpoint exactly where subjective perceptions comes into play.

1. on the question of where the limits of the harmonic units are
2. on the question of what notes are figurative

So when the segments and figurations are displayed later, hopefully these can be comprehensive, they represent only one of many possible different perspectives.

Our first example is a solo phrase by Charlie Parker on an F blues.
- Segmentation: I here the whole phrase as one harmonic unit.
- Figuration: I hear a and g# as a two note approach to the following a. In the same way I hear b flat and b as a two note approach to the following c.
- The order is linear upwards.
- The position is closed position with an octave doubled c.
- The remaining notes build an F major triad as pitch set. So this is the harmonic content of this phrase.

As an example for subjectivity you may have noticed, that the g and the b flat can also be heard as harmonically relevant. If you hear the phrase like this, the remaining notes build a 5 pitch set. (First 5 notes oft he F major scale)

Our second example is a solo phrase by Micheal Brecker on an C blues.
- I hear the first harmonic unit between g flat and a flat.
- There is no figuration because approach notes have to resolve to a close note and there is no interval of a second.
- The order is linear downwards.
- The position is closed position.
- And so the pitch set is a Abm7 four pitch set.

- I hear the second harmonic unit between f and g flat.
- There are many intervals off a second, but to me it sounds more like a linear downwards ordered diatonic scale in close position.
- So we have a Db mixolydian 7 pitch set.
- And to make it short, we finally have a 3 pitch set, that fits the C7 chord.

So the interesting thing here is, that the underlying harmony is blues subdominant to blues tonic, while Brecker plays the alter dominant progression Abm7 – Db7 – C that we all know from Duke Ellingtons Satin Doll.

I hope I could give you some insights how model analysis works. But now let's talk about the practical gain for the musician. Therefore we take a look at the possible applications.

That is:
- Analysis of the specific style of different players
- Practical use of melodic material in different harmonic situations
- Potential to increase ones melodic creativity

So let's start with style analysis. Here are some insights, that we got from analyzing the Parker phrase:

- Many figurations
- Close position
- Linear order
- Harmonic content fifth chord (inside)

And here are some insights, that we got from analyzing the Brecker phrase:

- Short harmonic segments
- No figurations
- Close position
- Linear order
- Harmonic content doesn't fit chord (outside)

Of course we would have to analyze at least one complete solo of each player to get reliable information. But some expected differences appear already in these two phrases. Such as the use of figuration and the amount of outside play. So through model analysis, insightful information can be gained, with witch techniques soloists create their personal sound.

And now comes the practical use, witch to me is the fun part. Here is again our Parker phrase. We had determined that the harmonic content is an F major triad. So an F major triad doesn't only sound inside on F7 like in Parkers Blues. It can likewise be used on these chords: ...

So with one melodic segment you can express many different harmonies. This I will demonstrate over a I-VI-II-V-progression:

1. Case: As Parker did, I use the segment matching it with the lowest part of the underlying chord.

2. Case: Now I use the segment matching it with the upper part of the underlying chord. With this, the result will sound different, since we'll hit numerous tensions.

3. Case: Finally I change the underlying harmonies into modern jazz type of chords and then use the segment matching it with any part of the underlying chord. The same progression might now sound like this:

Obviously there are numerous ways, in which the regarded segment can be practically used.

Last but not least, we come to the creative potential. Therefore we have to realize that within the factors oft he model changes can be made.

Here is the same phrase but with a different figuration.
And here is the same phrase with a different order.
Here the same phrase with a different position.

As you could hear, all these new phrases are audibly related to each other. But even more important is that they all have the same harmonic content. So everything I just played on the piano, I could do in the same manner with these new phrases.

And finally of course the pitch set can also be changed. Here I changed it into a minor triad. It doesn't necessarily have to be a triad, it can also be any other type of pitch set. So all you have to do then, is match the pitch set of the new phrase with the same type of pitch set within the underlying chord.

So I come to a first resume. Of an existing improvisation you can determine the different elements out of which the melodies are constructed. This is provided by the analytical application of the model. On the other hand these elements can be used to construct

melodies for a new improvisation. This is provided by the creative application of the model.

Not I would like to make another short note about subjectivity. If you practice model analysis in a class, you will probably find different perspectives all the time. Almost every time the analysis of the students will lead to different results for the same phrase. In the beginning this may feel quite unfortunate. We expect results to be clear and concrete. These expectations have to be re-considered. First, the different results reveal the various and ambiguous relations of the notes within a melody. And second different results offer a choice for the creative application. You can choose the result that fits the best to your way of hearing and thinking each particular melodic phrase. This will lead to a different sound result of each student although working with the same phrase.

And now I even want to go one step further. As I told you in the beginning, I am very much into maps. Maps you can put into your pocket. Obviously they are very handy. And so is the model. Led me show you. Therefore we take a look at every single factor of the model. We will see that with some simple thoughts the number of possible cases within each factor can be reduced to a very limited amount.

Let's start with the pitch sets. Think about the thousands and millions possible pitch sets. And then think about the word triad. Triad means two thirds on top of each other. But it remains open if these thirds are major or minor. And this is the idea of pitch set classes:

A pitch set class contains all different pitch sets, witch have the same interval structure, but regardless if the intervals are major, minor, diminished or augmented.

So if we follow this idea, we will see that there are only 18 classes of pitch sets. And as you will see, you will be very familiar with most of them.

- The first class is very simple. It contains all single pitches.
- There are 3 classes of 2 pitch sets. You can see seconds, thirds and fifths. Fourths, sixths and sevenths are contained in these classes since they are only inversions.
- There are 5 classes of 3 pitch sets. The first one is a part of a scale. The second one is the triad. The third one is a fourth structure. Everything very familiar. The fourth and fifth class can be seen as a 4 tone chord without a third or fifth.
- There are also 5 classes of 4 pitch sets. The first one is a part of a scale. The second one is four tone chord. The third one is a fourth structure. The fourth and fifth class can be seen as a triad with added second or fourth. Again very familiar.
- There are 3 classes of 5 pitch sets. The first one is again a part of a scale. The second one is a five tone chord. The third one is a pentatonic. Again very familiar.
- There is only 1 class of 6 pitch sets. It is a part of a scale.

So as you can see, all the thousands and millions of pitch sets fall into only 18 familiar classes.

As next we take a look at the position. Since wide position in melody appears extremely seldom we can confine ourselves to close position. Therefore it only remains the aspect of inversions. But if you practice the 18 classes of pitch sets, you will do this in all inversions. So we are already done with position.

And how about order? There is not so much to say about this as well. You can use structured orders such as linear upwards or downwards or zigzag. You may even want to use more complicated structures such as this... Or you can of course use random orders. This is already it.

Finally we come to the figuration. Here you should first make some considerations about halftone and whole tone approaches as well as about the difference between diatonic and chromatic approach from above and from below. But beyond this there are again only very few classes to mention. Here are the six possible classes of four note approaches. As you can see there are two approach notes coming from each site. More then two notes from one side are not realistic. So these are usually the biggest possible approaches. And these four note approaches contain obviously all of three note approaches, all two note approaches and all one note approaches. To get there you just have to leave out the first notes. So if you have practiced these six cases, you have a good foundation for every use of approach. Theoretically it is even possible to create larger approaches. But this happens by combining the smaller common approaches.

So finally I hope that you agree, that the amount of possible cases within each factor is very limited and easy to get familiar with.

After all I may have convinced you that this model works like a map. It gives you an overview over all possibilities of melody in tonal music. And to proof how all these possibilities of music are laid down in a plane field – like on a map – I like to ask people a funny question: „ What is in the middle between a pentatonic and a two note approach?“ Most people think that this question is nonsense. Pentatonic and two note approach are completely different things. So how can there be things in the middle? But look at it from the model point of view: A pentatonic is a five pitch set without figuration. A two note approach is a one pitch set with a two note figuration. So between a pentatonic and a two approach are all three pitch sets with a one note approach .

As I pointed out in the beginning my idea about jazz theory is to offer a map, to show the whole picture. I developed a map for melody in Jazz Theory 2 (for those of you who speak German) and a map for harmony in Jazz Theory 1. Furthermore I mapped all possibilities for arranging in Arrangieren.

But we live in the 21st century and – as sad as it is – maps became somehow out of fashion. Navis are the state of the art. And therefore Jazzomat is taking over. I appreciate the idea of computer-based analysis.

So I would like to make a final suggestion. GPS navigation systems are so successful because the combine the complete science behind maps (especially the mathematical insights of Gauss) with the means of digital data processing. As we can see you have all the means of digital data processing together. So to me now it will be crucial to combine them with the complete science behind the whole picture of music.